

Transforming food systems: Ethics, innovation and responsibility

edited by:

Donald Bruce and
Ann Bruce



Wageningen Academic
Publishers

Transforming food systems: Ethics, innovation and responsibility

Transforming food systems: Ethics, innovation and responsibility

EurSafe 2022
Edinburgh, United Kingdom
7-10 September 2022

edited by:
Donald Bruce
Ann Bruce



Wageningen Academic
P u b l i s h e r s

EAN: 9789086863877
e-EAN: 9789086869398
ISBN: 978-90-8686-387-7
e-ISBN: 978-90-8686-939-8
DOI: 10.3920/978-90-8686-939-8

First published, 2022

**© Wageningen Academic Publishers
The Netherlands, 2022**

This work is subject to copyright. All rights are reserved, whether the whole or part of the material is concerned. Nothing from this publication may be translated, reproduced, stored in a computerised system or published in any form or in any manner, including electronic, mechanical, reprographic or photographic, without prior written permission from the publisher, Wageningen Academic Publishers, P.O. Box 220, 6700 AE Wageningen, the Netherlands,
www.WageningenAcademic.com
copyright@WageningenAcademic.com

The individual contributions in this publication and any liabilities arising from them remain the responsibility of the authors.

The publisher is not responsible for possible damages, which could be a result of content derived from this publication.

Acknowledgements

This book contains the full papers presented at the 17th Congress of the European Society for Agriculture and Food Ethics, held in Edinburgh 7-10 September 2022, under the title Transforming Food Systems: Ethics, Innovation and Responsibility. We would like to thank the authors of these 81 papers for their work which they share at this conference, and the authors of the 22 short abstracts presented at the conference, reproduced separately. These thanks are especially due, as the COVID-19 pandemic continued to impact authors and reviewers alike during the period of writing and reviewing, in health, energy, time and workloads. Thank you for your patience and perseverance under difficult circumstances, and to Mike Jacobs of our publishers, Wageningen Academic Press, for his continuing assistance. Together the papers represent a most valuable and imaginative contribution to the themes of the conference, of which we are proud to be editors.

We are indebted to the support of our Local Organising Committee who have worked with us faithfully since we mooted the conference in 2019, and provided invaluable advice, guidance and work - Geoff Simm, Isabelle Darmon, Isabel Fletcher, Rob Smith and Darren Watt. Most especially we thank Helene Frossling, Events Officer of the School of Social and Political Science of the University of Edinburgh for her enormous administrative and organisational expertise and work to make this conference possible. Our sincere thanks go to the School of Social and Political Science and the Global Academy of Agriculture and Food Systems of the University of Edinburgh, and to Edinethics Ltd., who are the joint organisers of this conference, and to the staff of Edinburgh First for their assistance at the conference venue, the John MacIntyre Centre.

We would also like to thank the EurSafe Board for their support in holding the conference in Edinburgh, sharing our desire for this to be an in-person event, and especially to the President, Kate Millar, Secretary, Bernice Bovenkerk and Franck Meijboom, who have given us regular help and advice. We thank Eursafe for financial support in enabling this publication to be open access and for other aspects of the conference.

We are grateful for generous sponsorship from Aviagen plc, the Royal Society for the Protection of Cruelty to Animals (RSPCA) and Food Researchers in Edinburgh (FRIED). It is our hope that the inputs and insights from this conference may carry forward not only academic study, but those working at all levels to transform our food and agricultural systems.



Reviewers

We would like to thank all reviewers for their efforts and the time they invested in the review process and especially in the difficult circumstances of the COVID-19 pandemic. Their constructive feedback provided all authors with valuable support for the drafting of their short academic papers, as well as during the preparation of their presentations for the congress.

Stef Aerts
Felix Arion
Volker Beusmann
Lisa Boden
Bernice Bovenkerk
Ann Bruce
Donald Bruce
Isabelle Darmon
Diana Dumitras
Leire Escajedo San-Epifanio
Isabel Fletcher
Mickey Gjerris
Herwig Grimm
Amaia Inza-Bartolomé
Carl Walter Matthias Kaiser
Teea Kortetmäki
Manuel Magalhães Sant'ana

Franck Meijboom
Simon Meisch
Kate Millar
Iulia Muresan
Anna Olsson
Cristina Pocol
Helena Röcklinsberg
Per Sandin
Hanna Schuebel
Kirstin Shields
Rob Smith
Svenja Springer
Paul Thompson
Paulo Vaz-Pires
Ivo Wallimann-Helmer
Ariane Willemsen
Anna Wallenbeck

Table of contents

Acknowledgements	5
Reviewers	7
Food system transformation: the need for food ethics	17

Section 1.

Transforming the food system sustainably and justly

1. Combining transition, social network and social-ecological system frameworks in view of transforming agrifood systems <i>E. Berthet and Y. Deroche-Leydier</i>	21
2. Power, human rights and fresh produce: is due diligence failure a structural inevitability? <i>Z. Collins</i>	28
3. Addressing the political nature of agricultural sustainability transitions: lessons for governance <i>A. de Boon, S. Dressel, C. Sandström and D.C. Rose</i>	34
4. Climate change, vulnerability of food systems and institutional transformations in Senegal <i>D. Gmür, S. Felber, B. Owolodun, C. Ollier, L. Camara, A. Beye and T. Haller</i>	40
5. Taking value-landscapes seriously <i>M. Kaiser</i>	46
6. What is (not) the point of just transition in food systems? <i>T. Kortetmäki</i>	52
7. Neoliberal conditionality to the European agricultural system: free trade agreements as a paradigm <i>A. Lasa López</i>	58
8. Feminist political ecology of agricultural changes in Myanmar <i>N. Lopez</i>	63
9. Changing beekeeping seasons in Vestland, Norway <i>S.P. Meisch, M. Hempel, S. Bremer and E. Dunn-Sigouin</i>	69
10. Sustainable school food procurement in England: when there is a will, there is a way <i>F. Sabet</i>	76
11. Assessing the food security implications of climate change on global food trade <i>G.N. Sixt and K. Strzepek</i>	82

12. Impact of the COVID-19 pandemic on food and livelihood security of agricultural households in India 89
D. Veluguri, A. Awasthi, A. Roy, P. Prabhakaran and L. Jaacks
13. Food system resilience and governance: a pork story in China 95
J. Zhang, L.X. Liu and D. Tyfield
14. Organisational resilience and COVID lockdown: a multi-case study from restaurants in Wuhan, China 101
J. Zhang, L.X. Liu and D. Tyfield

Section 2.

Land and wild places

15. On the forms of harm stemming from the instrumentalization of large-scale ecosystems 109
S.I. Espinosa Flor
16. Using domesticated animals in rewilding projects: what does the public think? 115
C. Gamborg, F.S. Jensen and P. Sandoe
17. Do we need a new land ethics? 121
A. Kallboff
18. Challenging our thinking about wild animals with common-sense ethical principles 126
T. Katz and I. Wallimann-Helmer
19. Urban nature experiences for public health: an embodied perspective 132
S. McBride and I. Wallimann-Helmer
20. Debating planetary boundaries 138
S.P. Meisch and J.J. Schmidt
21. Farming with nature: lessons from rewilding agriculture and *Paysans de nature* 145
A. Mondière, V. Thomas, M.S. Corson, M. Diraison, P. Dulac, D. Siguier and H.M.G. van der Werf
22. Rewilding identity foodscapes: moral challenges from a multi-species justice perspective 152
C. Moyano-Fernández
23. Will the use of domesticated animals in rewilding projects compromise animal welfare? 159
P. Sandoe, C. Gamborg and C. Palmer
24. Domesticating rewilding: combining rewilding and agriculture offers environmental and human benefits 165
V. Thomas, A. Mondière, M.S. Corson and H.M.G. van der Werf

Section 3. Grasslands, ruminants and climate change

25. A participatory design approach to promote sustainable cattle breeding products and practices in Western France 173
E.T. Berthet, A. Farruggia and B. Roche
26. What role for England's grassland farming regions in the transition to a sustainable food system? 180
C.Y. Broomfield and A. Maber
27. Carbon price and be damned 186
D. Moran and D. Edgar
28. Who should take credit? Investigating the role of corporations in carbon removal developments 192
H. Schübel
29. Reciprocal climate adaptation responsibilities for agricultural food resilience 198
I. Wallimann-Helmer

Section 4. Animal ethics

30. The ethics of remedial animal enhancement: what can we learn from other (dis) enhancement debates? 205
B. Bovenkerk and K. Kramer
31. Identifying social and ethical aspects of feeding raw meat-based diets to dogs 211
N. Ciecierska-Holmes
32. The problem of justifying animal-friendly animal husbandry 217
K. Deininger
33. Capturing the animal in ethics – linguistic perspectives on understanding the animal concept 223
K. Dieck
34. Limited aggregation and zoonotic disease outbreaks 229
M. Eggel and A. Martin
35. Citizen views on animal welfare and animal rights in Flanders 235
L. Heyndrickx and S. Aerts
36. Aspect-seeing in animal research: the absence of justice in the harm-benefit analysis 240
E. Linder and H. Grimm
37. Constrained, contingent, and conflicted: complicating acceptance of animal research through an analysis of writing from the UK Mass Observation Project 245
R. McGlacken

38. Monetisation of ethical values in animal farming 251
H. Röcklinsberg, S. Jørgensen, H. Ahmed, K. Altvåsen, C. Berg, H. Hansson and U. Emanuelson
39. The institutional ethical review of animal research and the absence of ‘publics’ 257
K. Salter

Section 5. People and animals

40. Worldviews, values and perspectives towards the future of the livestock sector 265
K.J. Blair and D. Moran
41. Flying bamboo across the globe and invisible animals: tales of feeding animals in zoos 271
S. Brando, P. Rachinas-Lopes and M. Norman
42. Nothing else, mothers – conceptual and ethical perspectives on motherhood in pig farming 277
S. Camenzind and J. Karg
43. Reducing feed-food competition: impact of by-products and grazing in ruminant feeding 282
P. Cornale, A. Mimosi and L.M. Battaglini
44. Tracing responsibilities in food production with animals 288
S. Hartstang, D. Preuss, M. Giersberg and P. Kunzmann
45. Broadening the debate on breeding innovations – on public engagement and the role of the Democs Game 295
F.L.B. Meijboom, D.M. Bruce, K. Kramer and A. Bruce
46. Society and ethics in animal breeding: a bibliometric analysis 300
M. van der Sluis, K.H. de Greef and G. Bonekamp
47. The ‘*mise en place*’ for the ratatouille – Dutch (policy) developments towards an ethical management of commensal rodents 306
M.A.A.M. van Gerwen and F.L.B. Meijboom

Section 6. Veterinary practice and ethics

48. Learning to kill – how veterinarians reflect their learning process 315
M.J. Bubeck
49. Challenges of future vets – the impact of the killing of animals during education on veterinary students’ wellbeing 322
E. Deelen, L.F.E. Smolders, T.J. Tobias and F.L.B. Meijboom
50. Playing a vet – serious games in the context of veterinary ethics 328
C. Dürnberger

51. Veterinary responsibility for antibiotic resistance 334
M. Huth and J. Karg
52. Job stress of Korean veterinarians and the effect on job satisfaction 340
Y. Jung, S. Joo and M.S. Chun
53. Case discussions in a clinical ethics support service for equine medicine: a field report 344
M. Long, F. Jenner, Z. Kelemen, J.-M. Cavalleri, U. Auer and H. Grimm
54. Veterinarians as key intermediaries in sustainability discourse(s) 350
A. Nelke, K. Persson, F. Selter and T. Weber
55. What would you do – a transnational study on veterinarians' recommendations concerning radiotherapy in dogs and cats with cancer 356
S. Springer, T. Bøker Lund, P. Sandøe, H. Grimm, S.A. Corr and A.T. Kristensen

Section 7.

Eating: diet, meat, health and waste

56. Understanding the impact of COVID-19 on healthy and sustainable diets and wellbeing in UK parents 365
G. Bridge, J. Vogt, B. Armstrong, X. Schmidt Rivera, A. Sandhu and S. Stetkiewicz
57. Reduced beef consumption among different organic consumer groups – drivers and substitution patterns 371
S. Denver, J. Nordström and T. Christensen
58. Food waste: does agreement conceal ambiguity? 375
M. Gjerris and C. Gamborg
59. Governance of food insecurity – food waste, depolitization and shadow state 381
A. Inza-Bartolomé and L. Escajedo San-Epifanio
60. A discourse analysis on eating dog meat in South Korea for 20 years 387
S. Joo and M.S. Chun
61. Eat Well Age Well: tackling the hidden problem of undernutrition amongst older people 392
T. Robinson-Miles, K. Reid and L. Cairns

Section 8.

Food for the future: innovative technologies

62. Climate change, agriculture, and genome editing 401
A. Bachmann and A. Willemsen
63. Technological mediation of empathetic human-animal relations through gene editing technologies 406
L. Borgdorf, F.L.B. Meijboom and K. Kramer

64. Performing 'meat': meat replacement as drag 412
S. Efstathiou
65. Transforming food systems through genome editing – animal ethics and citizen engagement 418
A.I. Myhr, S.G. Carson and B.K. Myskja
66. Natural and sustainable – cellular agriculture's normative uncertainty 424
J. Rijssenbeek, Z. Robaey and V. Blok
67. The ethics and politics of cultured meat: food transition, big business, 'humanewashing' 428
C. Salzani and Z. Weisberg
68. New narratives of genetic engineering 434
P. Sandin
69. From iconic species to swimming vegetable: CRISPR as the new frontier in the domestication of salmon 440
H. Winther

Section 9. Ethical issues in marine and aquaculture

70. Consumers' perception of fish welfare in South Korea 449
T. Choi, S. Joo, J. Bae and M.S. Chun
71. Seaweed in the UK food system: pitfalls and pathways to scaling up sustainably 454
N. Fallon, X. Schmidt Rivera, L. Anguilano and S.K. Paterson
72. Sustainable seaweed food and feed – hope or hype? 460
G. Koksvik and B.K. Myskja
73. Ethics through technology – individuation of farmed salmon by facial recognition 466
M.F. Tröite and B.K. Myskja

Section 10. Data ethics

74. Digital technologies and food waste reduction and prevention: benefits and challenges 475
N. Strøm-Andersen
75. Do we improve any aspects of animal welfare by implementing Computer Vision in livestock farming? 481
A. van Putten, M.F. Giersberg and F.L.B. Meijboom

Section 11. Miscellaneous

76. Closing the gap: the interface between animal law and animal ethics <i>S.S. Andersen and M. Gjerris</i>	489
77. The use and misuse of the Universal Declaration of Animal Rights in Portugal <i>A. Azevedo, M. Whiting and M. Magalhães-Sant'Ana</i>	495
78. Doing interdisciplinarity blind: on the impossibility of naturalist applied ethics <i>K. Eckl and H. Grimm</i>	501
79. Challenges faced by the EU regulatory framework on GMOs after the ECJ ruling on mutagenesis <i>L. Escajedo San-Epifanio</i>	507
80. How smart should resilience be? On the need of a transdisciplinary approach to transform pig production systems <i>M.F. Giersberg, J.E. Bolhuis, T.B. Rodenburg and F.L.B. Meijboom</i>	513
81. The literary classroom conversation as a didactic method for teaching food ethics <i>S. Meisch and S. Hofer-Krucker Valderrama</i>	519
Author index	527

Food system transformation: the need for food ethics

We are only just emerging from what has been a devastating global pandemic that has rocked our systems and structures. The pandemic has further revealed the interconnectivity and fragility of our national and international food infrastructures. We do not know yet if we are in a post-pandemic era, but just as we emerge and re-engage in a social and interconnected world, we also face further challenges through international conflict that, according to June 2022 announcements from the UN and WTO, will lead to a 'global food crisis'.

This volume of papers represents the proceedings of the 17th Congress of the European Society for Agricultural and Food Ethics (EurSafe) on the very important and timely theme of 'Transforming Food Systems'. The EurSafe Congress is taking place between 7-10 September 2022 in Edinburgh, Scotland. The Congress covers issues and topics that are vitally important to discuss in these challenging and ever changing times as we seek to support and develop ethically robust and sustainable food systems that have ethical principles such as transparency, equity, wellbeing and inclusivity at their core. This volume is a call to put food ethics at the centre of our efforts to facilitate food system transformation.

The concept of food as a whole system has been around since the 1970s but it is only recently that the concept of a food system appears to have gained significant traction at a public policy level. Likewise notions of transformation have also been prominent over a number of years, but now appear to be key as we consider current and future food challenges and also the potential transformative power of diverse innovations in the food sector, such as gene editing, cultured meat, seaweed production, insect protein and the use of artificial intelligence. The challenge to reach net zero carbon raises important ethical questions about how we create sustainable and equitable food systems for a growing global population. Specific issues are raised about livestock systems, food choices including meat eating and possible alternatives, grasslands and land use generally. A number of these important topics will be explored at this 2022 Congress. Animal ethics, as ever, remains a prominent theme for EurSafe, with a range of papers on animal-human relations, animal use in research and veterinary ethics issues.

Our hosts for the Congress are Drs Ann and Donald Bruce, who are longstanding members of the European Society for Agricultural and Food Ethics and researchers who have been working in the wider field for many years. Dr Ann Bruce, University of Edinburgh, and Dr Donald Bruce, Edinethics, are excellently placed to bring together the exciting programme for this Congress. As well as their current work, which they have presented at past EurSafe Congresses and also will present here, Donald and Ann have been early voices in the ethical discussions of the ethics of food systems, particularly in terms of their earlier work on biotechnology development and use. Their book, 'Engineering Genesis: Ethics of Genetic Engineering in Non-human Species' published in 1998 was an important and early contribution that discussed many of the issues that would be the subject of research and debate over the next 25 years. It therefore not only seems appropriate that our EurSafe colleagues host the EurSafe 2022 Congress, at this time and on this topic as it is representative of some of the work Donald and Ann Bruce have focused on, but this Congress may also be seen as a celebration of their wider contributions to the field. With that said, I am not sure the Scientific and Organising Committees for the Congress when convened in 2021 could have predicted how important this theme would be in September 2022 and the potential of this event to mobilise our community on this topic for the years ahead.

As well as highlighting the importance of the key theme of the Congress, this volume represents a significant amount of work for the Edinburgh Congress Organising team at a difficult time. Although we appear to be emerging from the global pandemic, Conference planning and organising has been fraught with uncertainty over the last 18 months. The Edinburgh team, led by Ann and Donald Bruce,

have done an amazing job to deliver this volume, as the Congress proceedings, and as an important contribution to the field.

On behalf of the Society, I would like to extend and emphasise our wholehearted thanks to the Edinburgh team and in particular to Ann and Donald who have been determined to host a face-to-face meeting. Their dedication and warm spirits shine through in this endeavour and also in their support for the Society. I would also like to extend a very warm and grateful personal thanks to Ann and Donald for taking on the task of organising a EurSafe Congress at this time when many of us across the research community have been reluctant to step forward to take on such important roles and responsibilities at a time of such uncertainty. Thank you for all of your work.

To readers of this collection of Congress papers, I hope these extended abstracts support your own work and reflections on these important topics and the key theme of 'Transforming Food Systems'. Once again, I would like to thank the Edinburgh Congress team for their commitment and drive to organise this Congress at a time of notable uncertainty. As we open up, reconnect and start to benefit from being present in real-time and in real spaces, I hope all who read this volume will consider joining the EurSafe Community at a future event, such as the Congress in 2024. Please stay connected with EurSafe through our website (www.eursafe.org) and our Newsletters. Enjoy this Congress volume and for the EurSafe 2022 Congress participants, we hope you are energised and inspired by the face-to-face presentations of these stimulating contributions.

Professor Kate Millar

June 2022

President of the European Society of Agricultural and Food Ethics (EurSafe)

Director, Centre for Applied Bioethics, Schools of Biosciences and Veterinary Medicine and Science, University of Nottingham, UK

Section 1.

Transforming the food system sustainably and justly

1. Combining transition, social network and social-ecological system frameworks in view of transforming agrifood systems

E. Berthet^{1,2,3,4*} and Y. Deroche-Leydier^{1,2,3}

¹USC 1339, Centre d'Études Biologiques de Chizé, INRAE, 79360 Villiers-en-Bois, France; ²UMR 7372 Centre d'Études Biologiques de Chizé, CNRS & Univ. La Rochelle, 79360 Beauvoir-sur-Niort, France; ³LTSE Zone Atelier 'Plaine & Val de Sèvre', CNRS, 79360 Villiers-en-Bois, France; ⁴Université Paris-Saclay, INRAE, AgroParisTech, UMR SADAPT, 75231 Paris, France; elsa.berthet@inrae.fr

Abstract

Agrifood systems are complex systems with multiple dimensions that need to be understood to envision and foster their transformation towards sustainability. This paper presents an empirical case study carried out in a Long-Term Social Ecological site in western France. Drawing on 32 interviews with local stakeholders, participant observation and document analysis, three analysis frameworks were combined: socio-technological transitions, social networks and social-ecological systems. Our analysis highlights various strategies of innovation niche building, as well as hybridization between some of these niches and the dominant regime, the latter being pressured by both policy instruments and consumer demand. This study also shows a lack of connectivity between existing innovation niches and between key actors of the agrifood system, which hinders its systemic transformation toward increased sustainability and resilience. Finally, we open perspectives toward the co-design of new connections and cooperation between stakeholders and specifically underline the roles that existing intermediaries may play.

Keywords: social-ecological system transformation, agrifood system diagnosis, intermediaries, innovation niches

Introduction

Our global agrifood system¹ is thought to be responsible for approximately 60% of global terrestrial biodiversity loss, 24% of greenhouse gas emissions, 33% of degraded soils and the overexploitation of 20% of aquifers (Hajer *et al.*, 2016). Much of this environmental degradation is driven by high-input industrial agriculture, with global supply chains largely controlled by a small number of multinational agribusiness and food retail companies (IAASTD, 2009). As the pressure on ecosystems increases, the concentration and internationalization of agrifood systems increases their vulnerability to environmental, meteorological, health or economic shocks, as well as their dependence on fossil fuels (Tendall *et al.*, 2015, Blay-Palmer *et al.*, 2020). Such cascading process ultimately impedes agrifood system resilience. The concept of resilience has been particularly studied for social-ecological systems (SES), in an approach specifically considering the interrelations not only with social systems, and within ecological systems, but also between both (Folke *et al.*, 2010; Ostrom, 2007). SES resilience is defined as their capacity to 'absorb disturbances and reorganize while making changes in ways that retain essentially the same functions, structures, identities, and feedbacks' (Walker *et al.*, 2004). Understanding how agrifood

¹ Agrifood systems 'encompass the entire range of actors and their interlinked value-adding activities involved in the production, aggregation, processing, distribution, consumption and disposal of food products that originate from agriculture, forestry or fisheries, and parts of the broader economic, societal and natural environments in which they are embedded' (von Braun, J., Afsana, K., Fresco, L.O., Hassan, M. and Torero, M. 2021. Food system concepts and definitions for science and political action. *Nature Food* 2: 748-750.)

Section 1

system resilience may be restored or at least improved requires to consider agrifood systems as social-ecological systems (Foran *et al.*, 2014; Sundkvist *et al.*, 2005).

Several authors have developed criteria for SES resilience (Carpenter *et al.*, 2012; Cox *et al.*, 2010; Perrin *et al.*, 2020; Villar and David, s.d.). First, some properties are put forward, such as diversity and redundancy that ensure that functions are maintained even if components are altered by a shock; connectivity, with its mirroring property modularity, which helps contain disturbances by compartmentalizing social-ecological systems. These properties, coming from ecological studies on ecosystems, have been highlighted as being crucial for enhancing subsystems of agrifood systems, such as supply chains (Stone and Rahimifard, 2018), or farming systems (Meuwissen *et al.*, 2019). At the SES scale, another key for enhancing resilience is adaptive (Folke *et al.*, 2010) or even transformative governance (Chaffin *et al.*, 2016).

The relocation of agrifood systems may be understood as the restoration of links between actors in the value chains and at a territorial scale, in particular a greater involvement of consumers in the steering of agrifood system trajectory (Bricas, 2021; Lamine, 2015). Generally based on the development of short supply chains, relocation may also foster the striving of small-scale and family farms oriented towards agroecological practices. Agrifood system relocation may thus potentially increase its diversity, redundancy, connectivity and modularity, as well as facilitate inclusive and adaptive governance. Yet, under which conditions and to what extent may agrifood system relocation contribute to enhancing these properties and subsequently its resilience?

To address this question, we carried out a diagnosis of a rural territory in western France, in which an intervention project has been launched to support the agrifood system transformation toward increased resilience. This diagnosis aims to understand the agrifood system social structure and dynamics. In this case study, we consider agrifood system relocation as an innovation that may enhance its resilience, under conditions that need to be characterized. We combined three analysis frameworks for this diagnosis: the social-ecological framework for its highlights on resilience enhancing factors, as well as social network analysis, and transition (multi-level) framework.

Social network analysis has been chosen first because agrifood system relocation may change the relationships between actors, thus the social networks composing this system; and these changes may enhance its resilience or not (creating connectivity, modularity, etc.). Studying the morphology of networks (presence or absence of links, the number of interconnected individuals, etc.) allows assessing the potential for collective action oriented toward resilience. Social network analysis also sheds a light on how information circulates and how innovations develop and disseminate, in particular thanks to network intermediaries. Intermediaries can be defined as people or groups of people helping with access to information or the completion of a transaction between two agents, acting as a mediator or advisor, or supporting the innovation by encouraging actors to collaborate (El Bilali, 2020). Such actors have a higher number of relationships with the others; they are both central in their network, and at the interface with other networks. Consequently, they simultaneously have a role of leader in their network (Bodin and Crona, 2011), and they participate in the dissemination of information and in the creation of new hybridized knowledge (Ernstson, 2011).

The theory of transitions completes our analysis framework. It considers innovations as social phenomena (Bayiha, 2020; Akrich *et al.*, 2013), and highlights how sets of actors, institutions, artifacts and knowledge can be mobilized and/or modified to foster the diffusion of an innovation (Bui, 2015; Markard *et al.*, 2012). The multilevel approach (Geels, 2002; Geels and Schot, 2007) aims to identify the origin of an innovation and to characterize its modes of diffusion into three socio-technical levels: the regime, an organizational field in which cognitive, normative and coercive foundations are institutionalized; the

landscape, a set of exogenous socio-economic forces that influence the decisions of regime and niche actors; and the niches, 'places' where innovations can emerge and challenge the dominant regime (Geels and Schot, 2007, 2010). This framework highlights the positioning of actors in a system and their strategies, and specifically accounts for its dynamics, an important aspect when studying resilience.

Several articles underline the interest of coupling the study of transitions with a study of social networks (Bodin and Crona, 2009; El Bilali, 2020; Prell *et al.*, 2011). For instance, such an approach allows for a better understanding of how an innovation spreads and puts pressure on the socio-technical regime to change. It also sheds light on the roles of intermediaries to scale up innovations. In this paper, we mainly present preliminary results regarding intermediaries.

Methodology

The case study

This research is part of the research-action project Aliment'Actions. This project has been underway since late 2018 and is planned to run for 10 years. It is conducted in an agricultural territory south of Niort city (Nouvelle-Aquitaine Region, western France), which is a Long-Term Social-Ecological Research (LTSER) infrastructure (Bretagnolle *et al.*, 2018), named 'Zone Atelier Plaine & Val de Sèvre' (ZAPVS – Figure 1). This research infrastructure is a large (ca. 435 km²) rural territory encompassing about 400 farms and covering 40 villages (c.24 municipalities) totalling 34,000 inhabitants. It is representative of agricultural intensification and specialization, leading to an increasing use of pesticides and a simplification of the landscape due to the removal of hedges, the enlargement of crop fields, the simplification of crop rotations and the reduction of mixed farming at the benefit of cereal farming. The agrifood system of this territory has become more and more globalized, as agriculture relies on imported resources (fertilizers, chemicals, seeds, etc.) and about 60% of its production is exported internationally. Agricultural intensification poses considerable environmental problems in this territory, e.g. in regard to water quality, health or biodiversity. Despite several decades of environmental policy implementation and research led in collaboration with farmers in the ZAPVS, biodiversity decline continues to accelerate (Bongaarts, 2019) while the conventional agricultural model remains overwhelmingly dominant. Aliment'Actions aims to explore other, complementary levers for SES transformation.

For the diagnosis presented here, as the ZAPVS is not superposed to administrative boundaries; we enlarged our study to the Deux-Sèvres Department (Figure 1), to cover a more complete panel of actors of the agrifood system. The department is characterized by a low density of population (62 hab/km²); Niort is its main city, with the highest density of population and the concentration of many public services; the second most important city in the territory we studied is Melle. Half of the population lives in urban area while the other one lives in rural area.

Data collection and analysis

The main data analysed in this research is qualitative and has been collected in several ways: interviews, participant observation and focus group. After mapping the main stakeholders of the agrifood system according to their functions (production, transformation, retail, prescription, etc.) in the system, we used the snowball sampling and name listing method to identify the actors to interview (Borgatti, 2006; Cadger *et al.*, 2016; Prell *et al.*, 2011). The snowball method involves a primary data source indicating other potential data sources that will be able to participate in the research studies. The listing method identifies exemplary actors within the network: the frequency of repetition of their name reveals their importance within the network (Phung, 2019). We ended with conducting 32 interviews with different profiles: producers working in short and long food supply chain; actors of the food processing sector

Section 1

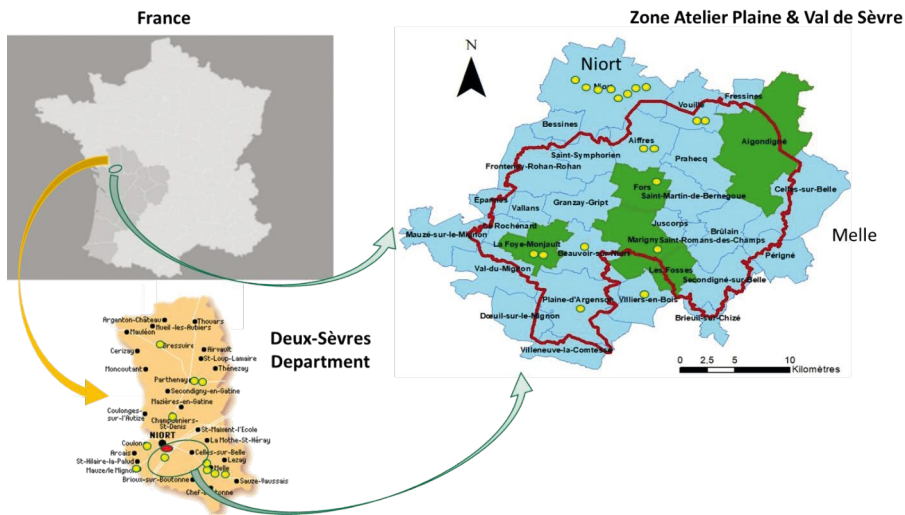


Figure 1. The Zone Atelier Plaine & Val de Sèvre is located in the South of Deux-Sèvres, western France. The yellow dots represent the actors interviewed.

(artisans or industries); supermarkets and groceries; representatives of scholar and collective catering; and public institutions. Each interview lasted between 1 and 2 hours.

Our semi-structured interviews were based on a question grid covering six main themes: (1) presentation of the interviewed actor, his/her background and functions; (2) missions and functioning of the organisation to which he/she belongs; (3) positioning in relation to the potential relocation dynamics of the food system and possible actions implemented in this sense; (4) links with other actors of the food system; (5) representations associated with the food system, its challenges and its potential relocation dynamics; (6) positioning in relation to two innovations already in place, a digital platform enabling direct sales from producers to consumers and the development of organic meals in school canteens.

Our data was triangulated with document analysis (grey literature, reports, websites, etc.), participant observation in local events organized by some stakeholders or by colleagues in the framework of Aliment'Actions, and with a focus group. Indeed, after a first phase of analysis, we presented our preliminary results with the people interviewed so that they could state whether or not they supported them. All the interviews were recorded, fully transcribed. The data was both summarised in an inductive way and coded with the software programme NVivo. We also created typologies of relationships that we summarised in tables and then exported to Graph Commons, a graphics software making it possible to visualise the relationships between all the actors.

Results

Our analysis reveals that different kinds of intermediaries exist in the agrifood system, with different roles, in particular regarding the potential for agrifood system relocation. In Melle, a local organic food grocery store develops several types of relationships with other actors: commercial relationships with consumers and producers, partnerships with public institutions, and exchange of information with other groceries and supermarkets in the city. Knowing well the various actors of his network, this intermediary proposes tailor-made (e.g. logistical) solutions to his interlocutors, in particular

small local farmers. He strongly contributed to develop a socio-technical niche promotes organic and local food. Interestingly, his relationships with diverse actors allow him to both develop initiatives within this socio-technical niche, but also influence the dominant regime. For instance, by promoting new local and organic supply chains for public canteens, he participates in the dissemination of niche practices to the regime. The local grocery store thus plays a role of innovation broker and architect of the social-network (Conrad, 2018).

Regarding the city of Niort, we identified two types of intermediaries. The first one is a local authority that took in charge since 2018 a food territorial project, an institutional instrument aiming to relocate the food system. This institution, which belongs to the dominant regime, has developed relationships with public and private actors of both niches and the dominant regime. It creates a dense network around a few actors who carry a food relocation strategy. The structure of this network is defined as 'core-periphery': the local authority gathers the majority of relationships, concentrates information, and the peripheral actors have few direct interrelations. In this context, the intermediary serves to reduce transaction costs: by centralizing information and sharing it with the people concerned, the institution reduces information asymmetry and informs partners of the needs of others, its expanded social capital promotes innovation (Callois, 2004).

The second intermediary in Niort is a farmers' store. Several local farmers have pooled their resources to share a distribution tool that facilitates direct sale of their products. Now locally renowned, the store has become an important partner for local authorities in charge of food relocation. The store was replicated in five other cities: its managers developed relational schemes based on 'bonding' type links, i.e. strong links inspiring trust, and accompanied the development of a common brand. Considered by other actors as a model to follow and a vector of innovation, this farmers' store is an intermediary contributing to disseminating good practices.

Each intermediary is complementary while creating different type of relationships. The local authority in Niort acts inside the dominant regime, gathers different actors in order to better understand their needs and creates appropriate relationships between actors a priori distant. The local grocery reinforces links with producers. These links facilitate the diversification of their activities and the operationalization of solutions to problems identified earlier. The farmers' store completes these actions by reinforcing links between consumers and producers and enhancing trust by being exemplar. Each of them has a significant transformative capacity within his or her social network. However, it seems important to foster relationships between these networks, which could be the next step in the territorial food relocation.

Our analysis proves that various interactions exist between the niches and the regime, in particular thanks to intermediaries. Thanks to their diverse nature, functioning, strategies and relationships with other actors, they promote a diversity of practices in favour of agrifood system relocation. Our study sheds light on the intermediaries' contribution to increase agrifood system resilience. First, they seem to be essential for the construction of a modular system. The different subnetworks are rather autonomous, which prevents from ripple effects in case of great shocks (Béné, 2020). Second, by connecting various actors (consumers, producers, local authorities, etc.), they create strong links between them, vector of robustness, as well as trust, key to collective action (Folke *et al.*, 2010). They also developed hybrid strategies, building links between the dominant regime and innovation niches. Their actions seem to enhance the cohesiveness of social networks, favoring collective action and transformative governance (Carpenter *et al.*, 2012; Chaffin *et al.*, 2016).

Final considerations

Finally, we would like to point that these results are still preliminary, that our study has some limitations and calls for further studies. First, the use of snowball and listing methods for data collection impeded us to have a complete view on the social network. Our analysis identifies the social position of intermediaries according to their own perception and to the place that other actors give to them. A more complete network analysis could better point the importance of weak links in the diffusion of information and ideas within and among social networks (Ferrary, 2010; Granovetter, 1973). Furthermore, there would be a need for studying more thoroughly the nature of the different links between actors (i.e. in terms of information shared, trust, aetc.). In this line, having a quantitative study on the volumes of products exchanged between actors could complete this analysis.

References

- Bayiha, G. (2020). Développement de l'agriculture biologique au cameroun : une analyse par l'approche des transitions sociotechniques. <https://doi.org/10.13140/RG.2.2.35359.79528>
- Béné, C. (2020). Resilience of local food systems and links to food security – a review of some important concepts in the context of COVID-19 and other shocks. *Food Security*, 1-18. <https://doi.org/10.1007/s12571-020-01076-1>
- Bodin, Ö. and Crona, B. (2011). Barriers and opportunities in transforming to sustainable governance : The role of key individuals. In C. Prell and Ö. Bodin (eds) *Social networks and natural resource management : uncovering the social fabric of environmental governance* (p. 75-94). Cambridge University Press. <https://doi.org/10.1017/CBO9780511894985.005>
- Bodin, Ö. and Crona, B.I. (2009). The role of social networks in natural resource governance : what relational patterns make a difference? *Global Environmental Change*, 19(3), 366-374. <https://doi.org/10.1016/j.gloenvcha.2009.05.002>
- Borgatti, S. P. (2006). Identifying sets of key players in a social network. *Computational & Mathematical Organization Theory*, 12(1), 21-34. <https://doi.org/10.1007/s10588-006-7084-x>
- Bricas, N. (2021). Une ecologie de l'alimentation.
- Bui, S. (2015). Pour une approche territoriale des transitions écologiques. Analyse de la transition vers l'agroécologie dans la Biovallée (1970-2015) [Phdthesis, AgroParisTech]. <https://tel.archives-ouvertes.fr/tel-02116016>
- Cadger, K., Quaicoo, A., Dawoe, E. and Isaac, M. (2016). Development interventions and agriculture adaptation : a social network analysis of farmer knowledge transfer in Ghana. *Agriculture*, 6, 32. <https://doi.org/10.3390/agriculture6030032>
- Callois, J.-M. (2004). Capital social et développement économique local. *Revue d'Economie Regionale Urbaine*, octobre(4), 551-577.
- Carpenter, S.R., Arrow, K.J., Barrett, S., Biggs, R., Brock, W.A., Crepin, A.-S., Engstrom, G., Folke, C., Hughes, T.P., Kautsky, N., Li, C.-Z., McCarney, G., Meng, K., Maler, K.-G., Polasky, S., Scheffer, M., Shogren, J., Sterner, T., Vincent, J.R., ... de Zeeuw, A. (2012). General resilience to cope with extreme events. *Sustainability*, 4, 3248-3259. <https://doi.org/10.3390/su4123248>
- Chaffin, B.C., Garmestani, A.S., Gunderson, L.H., Benson, M.H., Angeler, D.G., Arnold, C.A. (Tony), Cosens, B., Craig, R.K., Ruhl, J.B. and Allen, C.R. (2016). Transformative environmental governance. *Annual Review of Environment and Resources*, 41(1), 399-423. <https://doi.org/10.1146/annurev-environ-110615-085817>
- Conrad, E. (2018). Bridging the hierarchical and collaborative divide: the role of network managers in scaling up a network approach to water governance in California. In C. Ansell and J. Torfing, *How does collaborative governance scale?* Policy Press. <https://doi.org/10.1332/policypress/9781447340553.003.0003>
- Cox, M., Arnold, G. and Villamayor Tomás, S. (2010). A review of design principles for community-based natural resource management. *Ecology and Society*, 15(4). <https://doi.org/10.5751/ES-03704-150438>
- El Bilali, H. (2020). Transition heuristic frameworks in research on agro-food sustainability transitions. *Environment, Development and Sustainability*, 22(3), 1693-1728. <https://doi.org/10.1007/s10668-018-0290-0>

- Ernstson, H. (2011). Transformative collective action: a network approach to transformative change in ecosystem-based management. In *Social Networks and Natural Resource Management : Uncovering the Social Fabric of Environmental Governance* (p. 255-287). <https://doi.org/10.1017/CBO9780511894985.012>
- Ferrary, M. (2010). Dynamique des réseaux sociaux et stratégies d'encastrement social. *Revue d'économie industrielle*, 129-130, 171-202. <https://doi.org/10.4000/rei.4153>
- Folke, C., Carpenter, S.R., Walker, B., Scheffer, M., Chapin, T. and Rockström, J. (2010). Resilience thinking: integrating resilience, adaptability and transformability. *Ecology and Society*, 15(4). <https://www.jstor.org/stable/26268226>
- Foran, T., Butler, J., Liana, W., Wanjura, W., Hall, A., Carter, L. and Carberry, P. (2014). Taking complexity in food systems seriously: an interdisciplinary analysis. *World Development*, 61, 85-101. <https://doi.org/10.1016/j.worlddev.2014.03.023>
- Geels, F. and Schot, J. (2010). The dynamics of transitions: a socio-technical perspective (p. 11-104).
- Geels, F.W. (2002). Technological transitions as evolutionary reconfiguration processes: a multi-level perspective and a case-study. *Research Policy*, 31(8), 1257-1274.
- Geels, F.W. and Schot, J. (2007). Typology of sociotechnical transition pathways. *Research Policy*, 36(3), 399-417. <https://doi.org/10.1016/j.respol.2007.01.003>
- Granovetter, M.S. (1973). The strength of weak ties. *American Journal of Sociology*, 78(6), 1360-1380. <https://doi.org/10.1086/225469>
- Lamine, C. (2015). Sustainability and resilience in agrifood systems : reconnecting agriculture, food and the environment. *Sociologia Ruralis*, 55(1), 41-61. <https://doi.org/10.1111/soru.12061>
- Markard, J., Raven, R. and Truffer, B. (2012). Sustainability transitions: an emerging field of research and its prospects. *Research Policy*, 41(6), 955-967. <https://doi.org/10.1016/j.respol.2012.02.013>
- Meuwissen, M.P.M., Feindt, P.H., Spiegel, A., Termeer, C.J.A.M., Mathijs, E., Mey, Y. de, Finger, R., Balmann, A., Wauters, E., Urquhart, J., Vigani, M., Zawalińska, K., Herrera, H., Nicholas-Davies, P., Hansson, H., Paas, W., Slijper, T., Coopmans, I., Vroeghe, W., ... Reidsma, P. (2019). A framework to assess the resilience of farming systems. *Agricultural Systems*, 176, 102656. <https://doi.org/10.1016/j.agsy.2019.102656>
- Ostrom, E. (2007). Challenges and growth : The development of the interdisciplinary field of institutional analysis. *Journal of Institutional Economics*, 3(3), 239-264. <https://doi.org/10.1017/S1744137407000719>
- Perrin, A., Milestad, R. and Martin, G. (2020). Resilience applied to farming: organic farmers' perspectives. *Ecology and Society*, 25(4). <https://doi.org/10.5751/ES-11897-250405>
- Phung, C.G. (2019). Contributions des intermédiaires de transition à la diffusion d'une niche sociotechnique. *Technologie et innovation*, 4(2). <https://doi.org/10.21494/ISTE.OP.2019.0342>
- Prell, C., Reed, M. and Hubacek, K. (2011). Social network analysis for stakeholder selection and the links to social learning and adaptive co-management. In C. Prell and Ö. Bodin (Éds.), *Social networks and natural resource management: uncovering the social fabric of environmental governance* (p. 95-118). Cambridge University Press. <https://doi.org/10.1017/CBO9780511894985.006>
- M. Akrich, M. Callon and B. Latour (2013). *Sociologie de la traduction : Textes fondateurs* (eds) Sociologie de la traduction : Textes fondateurs. Presses des Mines. <http://books.openedition.org/pressesmines/1181>
- Stone, J. and Rahimifard, S. (2018). Resilience in agri-food supply chains: a critical analysis of the literature and synthesis of a novel framework. *Supply Chain Management: An International Journal*, 23(3), 207-238. <https://doi.org/10.1108/SCM-06-2017-0201>
- Sundkvist, Å., Milestad, R. and Jansson, A. (2005). On the importance of tightening feedback loops for sustainable development of food systems. *Food Policy*, 30(2), 224-239.
- Villar, C. and David, M. (s.d.). La résilience, un outil pour les territoires ? 2014, 8. https://www.cerema.fr/system/files/documents/2017/10/VILLAR_DAVID_article_completV4_cle7315c6.pdf.

2. Power, human rights and fresh produce: is due diligence failure a structural inevitability?

Z. Collins

Natural Resources Institute (NRI), University of Greenwich, Medway Campus, Central Avenue, Chatham Maritime, Kent, ME4 4TB, United Kingdom; zc9729n@gre.ac.uk

Abstract

The risk of human rights violations in agri-food supply chains is well documented and this has led to growing pressure on the UK supermarkets to increase supply chain transparency and accountability through improved due diligence practices. However, considerable gaps remain in the translation of their policy commitments into meaningful improvements for workers. To understand the reason for this, it is necessary to consider the role of first-tier suppliers who are increasingly handed responsibility for implementing due diligence by nature of their direct relationship with sub-suppliers. Focusing on the UK fresh produce industry, this paper examines the commercial reality of performing due diligence as a first-tier supplier and explores the power asymmetries, market pressures and logistical barriers that shape due diligence practices and outcomes. These factors illustrate how first-tier suppliers, despite being given responsibility for due diligence, do not have the power to influence the business terms set by supermarkets that define the structural dynamics of the supply chain and ultimately create the conditions for labour exploitation to thrive and due diligence to fail.

Keywords: labour rights, supply chains, exploitation

Introduction

The risk of human rights violations in agri-food supply chains is well documented and this has led to growing pressure on the UK supermarkets to increase supply chain transparency and accountability through improved due diligence practices. However, considerable gaps remain in the translation of their policy commitments into due diligence actions that deliver meaningful improvements for workers. To understand the reason for this, it is necessary to consider the crucial, yet under-researched, role of first-tier suppliers who are increasingly handed responsibility for implementing due diligence by nature of their direct relationship with sub-suppliers, where the risk of serious social failure is greatest (Grimm *et al.*, 2014; Wilhelm *et al.*, 2016). Drawing on my experience of working for a first-tier supplier, along with conversations with other supply chain actors, this paper examines the commercial reality of performing due diligence as a first-tier supplier and explores the power asymmetries, market pressures and logistical barriers that shape due diligence practices and outcomes. Specifically, I focus on due diligence in the fresh produce industry because of my experience in this sector but also because increased fruit and vegetable consumption is widely hailed as the path to healthier, more sustainable diets. However, this idea of sustainability has largely been explored from the environmental perspective, rather than the social, and there is a need to try and rectify this imbalance (Govindan *et al.*, 2021).

Methodology

The data that informed this paper was collected as part of a broader project seeking to improve the monitoring and remediation of supply chain risks for greater resiliency in global fresh produce sourcing. This project was an academic and commercial collaboration between the University of Leeds and a UK fresh produce company. Directly employed by the company, I was responsible for the systematic

recording of information on behalf of the lead researcher, as well as the implementation of due diligence practices within the commercial environment. However, the purpose of this paper is not to examine the processes and practices of a particular company but to reflect on the wider dynamics and structures within the fresh produce sector. As such, this paper was also informed by conversations with actors working in different parts of the value chain, as well as those working in similar companies to myself. This paper focuses on the common experiences identified, recognising that the fresh produce industry is a broad sector with different challenges and requires further in-depth research beyond the scope of this paper.

Understanding the due diligence process

There are two main stages in the due diligence process. The first concerns the identification of actual and potential human rights risks for workers and the second involves the steps taken to mitigate and remediate these. Whilst the responsibility for due diligence is increasingly passed to first-tier suppliers, the requirements and remit of the due diligence process are set by the supermarkets. The retailers continue to favour the traditional compliance model, with the labour standards expected of suppliers outlined in their Codes of Conduct and evidence of compliance sought through Sedex, a membership organisation that provides a platform for buyers, suppliers, and auditors to store, share and report on ethical and environmental supply chain data. Suppliers are required to register with Sedex, complete – and keep updated – the self-assessment questionnaire (SAQ) and share this information with buyers by linking with them on the platform. Suppliers must also certify with GLOBAL G.A.P but this is primarily an assessment of food safety and quality rather than labour standards. In general, third-party audits are only required for packhouses where retailer branding is applied and that are in high-risk countries. The nations classed as high-risk depend on the risk assessments of the individual retailers but largely excludes Europe, US, Australia and New Zealand. When audits do take place, they must use the SMETA methodology, a social auditing procedure developed by Sedex that uses the ETI base code and local laws as measurement criteria.

The retailers state that they focus on sites where branding is applied because they have the greatest responsibility and influence at these locations, but it is also where they have the greatest liability. Likewise, the extent of their influence is limited as it is the first-tier suppliers that are expected to monitor second-tier suppliers, not the supermarkets. The exclusion of farms and certain regions in the Global North from the due diligence remit also presents labour abuse as an issue that mainly occurs in the Global South and that begins and ends in the packhouse, two notions that are widely known to be false (Wilshaw, 2018).

Moreover, the reliance on Sedex is problematic as whilst the platform, in theory, streamlines due diligence by providing a single place in which to store and share supply chain data, clumsy functionality limits usability. It becomes impenetrable to users when not available in their own language or their internet speed insufficient to keep SAQs updated. The system is also open to abuse as suppliers can link with buyers but hide their audit history. Others will answer their SAQs based on the standards required by the buyer rather than the reality. Furthermore, the reliance on SAQs is not conducive to farm-level transparency; a single second-tier supplier can be sourcing from hundreds of growers and it is impractical to expect an SAQ to be filled out for each. It is also a considerable administrative challenge to ensure that every second-tier supplier has registered on Sedex, updated their SAQs and, where required, arranged to be audited, all before the sourcing season begins. Inevitably, not all suppliers complete this on time, with some even missing from Sedex entirely.

At the same time, first-tier businesses are increasingly unable to verify the information provided by second-tier suppliers or follow-up with them to ensure compliance. Cost reductions within the industry

Section 1

have reduced the number of site visits, an issue only worsened by the travel restrictions imposed by the pandemic. Meanwhile, cuts to corporate responsibility teams renders sustainability the ‘responsibility of everyone but the job of no one.’ This limits opportunities for genuine scrutiny and can render due diligence a mere tick-box exercise; even if audits take place and SAQs are completed, the findings are seldom interrogated or remediated. As such, even if second-tier suppliers disclose labour rights violations in their SAQs, the intense pressure to fulfil orders and maintain supply continuity mean that these issues are unlikely to be picked up.

The information provided by audits can also be biased and incomplete, despite being presented as a rigorous additional layer of due diligence for higher risk suppliers (Locke *et al.*, 2009). Workplace conditions in the fresh produce industry change very quickly to meet the demands of the just-in-time supply chain. However, as audits provide just a snapshot of conditions on given day, the pressure and the vulnerabilities this can create for workers, such as excessive enforced overtime, potentially without pay, and the increased use of temporary and sub-contracted labour, may not be captured (Marx and Wouters, 2016). There is also no requirement for audits to be unannounced but knowing the audit date gives suppliers the opportunity to prepare the working environment for inspection (Wilshaw, 2018).

Indeed, although audits have played an important role in establishing what constitutes responsible behaviour in supply chains, there is much evidence that they cannot capture systemic abuses like discrimination, harassment and forced labour or identify the root causes of exploitation (LeBaron *et al.*, 2017; Wilshaw, 2018). Even when audits are unannounced and managers fully comply with the process, auditors do not have enough time to build-up the trust needed for workers to disclose. First-tier businesses also undermine this trust when they fail to compel second-tier suppliers to address non-compliances; when workers see no improvement following an audit, particularly if they have disclosed abuses, they become even less likely to speak out in the future. Labour standards may also worsen following an audit as less severe abuses can develop into more exploitative practices if unaddressed (France, 2016).

The power to make change

The shortcomings of the due diligence approach favoured by supermarkets are thus abundant and mutually-reinforcing. Yet even if second-tier suppliers answered their SAQs honestly, audits were accurate and comprehensive, and first-tier suppliers had more staff and resources to identify violations and follow-up with their suppliers, would labour standards improve? Locke *et al.* (2009) argue that compliance-focused due diligence will only ever deliver limited and uneven improvements because this approach is underpinned by faulty assumptions regarding how global supply chains work. In particular, there is a perception that supermarkets, if only willing, can use their purchasing power as the lead firms dominating food supply chains to force suppliers to improve labour conditions. Yet this is overly simplistic as the idea of buyer-driven governance bringing unruly suppliers under control fails to recognise that power in supply chains is neither static nor unidirectional and that there is greater nuance to the relationships between actors which vary throughout the sourcing calendar and, fundamentally, are shaped by the structural dynamics of the supply chain (Gereffi, 1994; Locke *et al.*, 2009). In fact, it is not the purchasing power itself, but the business terms set using this purchasing power which ultimately create the conditions for labour exploitation to thrive and due diligence to fail. And whilst first-tier suppliers are given the responsibility for due diligence, they do not have the power to affect these business terms.

One of the main challenges that first-tier suppliers face is their ability influence a second-tier supplier to improve labour standards varies throughout the sourcing calendar. Their influence is greatest when the sourcing season is about to begin as second-tier suppliers are eager to ensure that contracts are honoured

and therefore are more receptive to requests to address non-compliances. Once supply has begun, however, the ability of first-tier businesses to leverage change can decline as they cannot afford to drop suppliers and compromise the continuity of the just-in-time supply chain. As their suppliers recognise that there will be no consequences for their inaction, it is more cost effective for them to continue business-as-usual because improving labour conditions, such as increasing wages or purchasing protective equipment, will affect their profit margins. Others are only willing to address minor non-compliances as these are the cheapest and most straightforward to resolve. But whilst this gives the impression of engagement with the continuous improvement process, it has the smallest impact on workers. These issues are compounded by the fact that suppliers of all tiers are only typically contracted for one season at a time. This is due to long-term trading relations being eroded by the supermarket's downward pressure on price and their emphasis on financial short-termism as a result of shareholder primacy (Wilshaw, 2018). As neither first-tier or, in turn, second-tier suppliers have any certainty that they will still have business the following season, the latter have little commercial motivation to address non-compliances and the former little incentive to encourage them. Improving labour standards also requires long-term commitment and investment, which short-term contracts are a barrier to.

There is also a danger in first-tier businesses pushing second-tier suppliers too hard for improvements. UK fresh produce companies use Sedex more widely than the rest of Europe (Sedex, 2022) where many importers just require GLOBAL G.A.P. certification. As a result, the ethical compliance required by the UK fresh produce sector can be more extensive and costly to achieve. This, combined with the fact that European importers often have higher purchasing volumes, renders the UK market increasingly unattractive to suppliers. As a result, some larger second-tier suppliers may threaten to cease supply when pressured to improve labour standards as they do not perceive the contract value to be worth the effort or the money it would take to address non-compliances. This would be highly disruptive for first-tier businesses as these suppliers, by virtue of their size, are more efficient to work with and therefore are central to their sourcing programme. As losing such suppliers would compromise the ability of these first-tier businesses to fulfil their retailer contracts, a power imbalance is created whereby first-tier suppliers are more dependent on their core suppliers than they are on them. This challenges the idea that the agency of actors declines as you move down the supply chain and positions first-tier suppliers as 'the piggy in the middle', caught between the retailers who expect them to address human rights risks in the lower tiers and second-tier suppliers who are unwilling to make the necessary improvements (Marshall *et al.*, 2019). There is even the risk that the second-tier supplier may cut them out of the transaction entirely by bidding directly for the supermarket contract the following season. The potential for a supplier to become a competitor further disincentivises collaboration.

The unwillingness of some larger second-tier suppliers to improve labour conditions is particularly disappointing given that they are more likely to have the resources to enact change as well as the greatest scope for impact given the sheer number of workers involved in their operations. Yet for smaller second-tier suppliers, it is often not a lack of willing but a lack of funds and know-how that both puts workers at risk and prevents labour conditions from being improved. Furthermore, cuts to corporate responsibility teams mean that first-tier suppliers do not have the staff needed to support second-tier suppliers in developing and enacting continuous improvement plans. There is also an irony in asking suppliers to make often costly improvements whilst simultaneously demanding ever cheaper food, especially given that labour improvements will typically not be rewarded with additional business, in the same way that suppliers who fail to address non-compliances are generally no more likely to be dropped (Lund-Thomsen and Lindgreen, 2014). This is because in a system that prioritises the ability to deliver the correct volumes at the required quality, on time and, most crucially, at the right price, labour standards are not a primary concern. Indeed, abuses, such as excessive overtime, underpayment of wages and forced labour, may even be the reason that suppliers are able to fulfil these business terms and remain competitive (Davies, 2020).

Section 1

In addition to fuelling labour abuses, attempts to resolve legitimate business challenges can create human rights blind spots through the practice of spot purchasing, a standard but largely undocumented element of most supply chains which is used to make up short falls in volume or quality. First-tier suppliers are encouraged to keep spot purchased volumes to a minimum and use pre-approved growers, but in a market where low price and continuity of supply are the primary drivers, the incentive for struggling suppliers of any tier to supplement with stock from an unregulated source increases. The need for spot purchasing is also intensifying as first-tier suppliers move into more politically-volatile countries to source cheaper food and extreme weather events, driven by climate change, increasingly compromise supply. The more acute the shortage, the more intense the pressure, and the higher the financial incentive.

However, spot purchased produce is a black box with only the country of origin and the pesticide residue levels known. Whilst the produce must be GLOBAL G.A.P. certified, it is otherwise considered to be outside of the due diligence remit and thus suppliers have no insight into the labour conditions of those who grew, picked or packed this produce unless it comes from a pre-authorized grower. Yet the riskiest spot purchased produce is that which comes from second-tier suppliers without the first-tier's consent. This is only made more likely by the erosion of long-term trading relations but is difficult to detect as the produce can be mixed in with stock from a pre-authorized grower. As such, normally the first sign that something is amiss is if the produce tests positive for a banned pesticide or exceeds safe residue levels. Yet this largely depends on the produce being selected for a random pesticide check as the formal tests happen at the start of the season but unauthorised produce is more likely to enter the supply chain at the end as a result of either volume or quality shortfalls. As such, spot purchased produce represents both a food safety hazard and a human rights risk.

Conclusions

There is tendency to see labour exploitation as a knowledge problem, that if we only knew where the abuses were happening, we could fix them. However, whilst the identification of labour abuses is a key part of the due diligence process, having greater visibility of problems does not equate to the power to address them. As this paper has demonstrated, whilst first-tier suppliers are increasingly given responsibility for human rights due diligence, they do not have the power to influence the business terms set by the supermarkets that ultimately determine the structural dynamics of the supply chain. Short-term contracts, the pressure of the just-in-time supply chain and the downward push on price – factors which characterise many supply chains, not just fresh produce – all create the conditions for labour exploitation to thrive and due diligence to fail. If the due diligence process is to deliver meaningful improvements for the most vulnerable workers, these structural drivers must be reformed.

References

- Davies J. (2020). Corporate harm and embedded labour exploitation in agri-food supply networks. *European Journal of Criminology* 17(1): 70-85.
- France, B (2016). Labour compliance to exploitation and the abuses in-between. Labour Exploitation Advisory Group, London UK.
- Geroffi, G. (1994). The organization of buyer-driven global commodity chains: how U.S. retailers shape overseas production networks. In: Geroffi, G. and Korzeniewicz, M. (eds.) *Commodity chains and global capitalism*. Praeger, Westport CT, pp. 95-122.
- Govindan, K., Shaw, M. and Majumdar, A. (2021). Social sustainability tensions in multi-tier supply chain: a systematic literature review towards conceptual framework development. *Journal of Cleaner Production* 279: 123075.
- Grimm, J.H., Hofstetter, J.S. and Sarkis, J. (2014). Critical factors for sub-supplier management: a sustainable food supply chains perspective. *International Journal of Production Economics* 152: 159-173.

- LeBaron, G., Lister, J. and Dauvergne, P. (2017). Governing global supply chain sustainability through the ethical audit regime. *Globalizations* 14(6): 958-975.
- Locke, R., Amengual, M. and Mangla, A. (2009). Virtue out of necessity? Compliance, commitment, and the improvement of labor conditions in global supply chains. *Politics & Society* 37(3): 319-351.
- Lund-Thomsen, P. and Lindgreen, A. (2014). Corporate social responsibility in global value chains: where are we now and where are we going? *Journal of Business Ethics* 123: 11-22.
- Marshall, D., McCarthy, L., Claudy, M. and McGrath, P. (2019). Piggy in the middle: how direct customer power affects first-tier suppliers' adoption of socially responsible procurement practices and performance. *Journal of Business Ethics* 154: 1081-1102.
- Marx, A. and Wouters, J. (2016). Redesigning enforcement in private labour regulation: will it work?. *International Labour Review* 155: 435-459.
- Sedex (2022) Our Members. Available at: <https://www.sedex.com/about-us/our-members/> Accessed 22 April 2022
- Wilhelm, M.M., Blome, C., Bhakoo, V. and Paulraj, A. (2016). Sustainability in multi-tier supply chains: understanding the double agency role of the first-tier supplier. *Journal of Operations Management* 41: 42-60.
- Wilshaw, R. (2018). UK supermarket supply chains: ending the human suffering behind our food. Oxfam GB, Oxford UK.

3. Addressing the political nature of agricultural sustainability transitions: lessons for governance

A. de Boon^{1*}, S. Dressel², C. Sandström³ and D.C. Rose¹

¹University of Reading, School of Agriculture, Policy and Development, Early Gate, Whiteknights, Reading, RG6 6EU, United Kingdom; ²Wageningen University and Research, Forest and Nature Conservation Policy Chairgroup, P.O. Box 47, 6700 AA Wageningen, the Netherlands; ³Umeå University, Department of Political Science, 901 87 Umeå, Sweden; a.i.b.deboon@pgr.reading.ac.uk

Abstract

Agriculture is facing increasing challenges as a result of climate change, biodiversity loss, environmental degradation, and demographic change. Yet, at the same time, currently dominant agricultural practices contribute to exacerbate these challenges. It is therefore widely recognized that there is a need for an agricultural sustainability transition. However, what this transition should look like and how it should be brought about is a value-based, normative judgement with differing implications for different people, making transition processes inherently political. In order to govern these processes in a way that recognizes the ethical implications of the political nature of agricultural transitions, we need to understand all the components that influence, and are influenced by, transition processes, interactions across societal levels, and the normative and power dynamics that come together to shape the direction and outcomes of transition processes. In addition, we need insights into what aspects people consider when they build their perceptions of the legitimacy and justice of an agricultural transition. In this paper we draw together overarching lessons learned from extensive reviews of dominant transition, legitimacy, and justice theories, interviews with stakeholder organisations, and a survey of 400 English adults.

Keywords: agricultural transition, perceived justice, perceived legitimacy, sustainability

Introduction

It is widely acknowledged that there is a need for an agricultural sustainability transition (El Bilali, 2020). However, transitions are inherently disruptive as the old system that we are transitioning away from needs to be considerably altered if not destructed altogether (Kivimaa *et al.*, 2021), and the consequences of this will vary for different people (Leach *et al.*, 2007). Transitions are also inherently normative. In as far as transitions happen deliberately, society has a choice as to what the transition should look like both in terms of the ideal end-state we want to reach and the path to reach it. Yet, because people will experience and value certain pathways and end-states differently, the desirability of a certain transition is a value based, normative judgement (Meadowcroft, 2011). Due to this disruptive and normative nature of transitions, the agricultural transition process forms a contested arena where differing interests compete over influence on the direction and manner in which the agricultural sector develops, making the transition itself inherently political (De Boon *et al.*, 2021).

In order to govern the agricultural sustainability transition process in a way that recognizes the ethical implications of its political nature, we need to understand all the components that influence and are influenced by the transition process, interactions across societal levels, and the normative and power dynamics that come together to shape the direction and outcomes of the transition (Leach *et al.*, 2007; Ostrom, 2009). This also includes developing an understanding of what aspects people consider when they build their perceptions of the legitimacy and justice of an agricultural transition, as these are essential elements for the successful implementation and long-term social sustainability of the transition

(Rothmund *et al.*, 2016). The wider literature on the governance of sustainability transitions has often been criticised for neglecting the role of power and political nature of transitions (Avelino *et al.*, 2016; Meadowcroft, 2011), and whilst over the past ten years efforts have been made to address this critique (Avelino and Wittemayer, 2016), a recent review of literature on sustainability transitions still speaks of ‘a moral vacuum in transition research’ (Köhler *et al.*, 2019, p. 16). Likewise, in the specific context of agricultural sustainability transitions, recent articles have highlighted that more attention needs to be paid to the (social) justice aspects related to these kind of transitions (e.g. Blattner, 2020; Hebinck *et al.*, 2021). It is our aim to address this research gap by exploring the components of the agricultural transition process and the way in which people shape their perceptions of the transition and to draw lessons from these insights that can support the governance of these processes.

Methods

To accomplish our study aim we connect key findings from three literature reviews with semi-structured interviews with stakeholder organisations in the post-Brexit agricultural transition context and results of a survey of 400 English adults. This case study context was chosen because it presents a crucial case of abrupt policy change in which normative and political dynamics will be amplified in comparison to the more common incremental processes of policy change (Kern and Howlett, 2009). The first literature review focussed on key system components of agricultural innovation and the governance of agricultural innovation processes (see De Boon *et al.* (2021) for more details). The second literature review examined literature on legitimacy, addressing both normative and sociological approaches to legitimacy. This review was further complemented with empirical data from 14 interviews. Interviewees included stakeholder organisations with either a social, environmental, economic, or farming/forestry/landowner interest and with differing degrees of involvement in the agricultural transition process (see De Boon *et al.* (2022) for more details). The third literature review focussed on the concept of justice and the underlying structures and interconnected dimensions that are generally used to make normative claims of justice. For this review we targeted literature from the fields of political philosophy, social psychology, environmental justice, food justice, and social justice as all these fields come together within the governance of agricultural transitions. Findings from this review were used to build a survey to measure the underlying structures of justice perceptions in relation to agricultural transitions.

Results and discussion

The components that we identified as central to an agricultural transition include the macro context, the foundation on which the transition is built, the innovation process, and the governance system. We address each in turn.

Macro context

The macro context constitutes grand macro societal and ecological structures such as macro-political and economic developments, demography, biodiversity, and climate. Whilst the average individual has no, or at most very limited, influence over these structures (Geels and Schot, 2007), alterations in these structures, or in our perception of them, form direct and indirect drivers of change and provide motivational forces for the transition. This is also the place where the first political dynamics of the transition arise: when are alterations in the macro context of such a nature that they require a transition, what should the end-goal of the transition be (i.e. new acceptable state of the macro context), and who decides this? These questions constitute the first anchoring points based on which people form their perceptions of the legitimacy and justice of the transition. In terms of perceived legitimacy of the transition, this relates to the extent to which the prioritization of problems that should be addressed through the transition and aimed for end goal are perceived to reflect the interests of the people or are

Section 1

regarded as being in the wider interest of society (Scharpf, 1999; Suchman, 1995). It also includes whether those who wish to have a say in these decisions feel like they have been meaningfully included in this decision-making process (Steffek, 2019; Suchman, 1995). In terms of perceived justice of the transition, this relates to perceptions of whether or not stakeholders have been involved in decision-making to the right degree, regardless of whether or not the person forming this perception is a stakeholder themselves, as well as perceptions on the principle that is used to distribute influence within the decision-making process (Kaljonen *et al.*, 2021). In addition, it relates to perceptions on whether the right kind of stakeholders, at the right geographical scale, were considered when developing the problem prioritization and goal formulation and whether, in the identification of (the source of) the problem, the right type of knowledge was used (Bennet *et al.*, 2019; Martin *et al.*, 2016).

Foundation

The foundation encompasses the meso- and micro structures within which the transition process occurs. They influence the ease or difficulty with which a specific transition can be implemented, as well as how the consequences of the transition impact individuals. Simultaneously, however, these are also the structures that must be altered or disrupted for the transition to take place (Kivimaa *et al.*, 2021). The meso structure, or immediate context, is formed by the local natural environment, physical infrastructure, the market, formal and informal institutions and organisations, and their respective innovative and adaptive capacity (Pigford *et al.*, 2018). The micro structure of the foundation constitutes the innovative and adaptive capacity of individuals as well as their psychosocial factors, or willingness to adapt, to the transition. The innovative and adaptive capacity influence whether an individual has the capability to respond to the transition in a successful manner or even affect the transition process and its outcome, whilst the willingness to adapt highlights the normative orientation of the individual in relation to the transition. The foundation forms the second platform of power contestation and consequently another anchoring point around which people form their perceptions of the legitimacy and justice of the transition. The power dynamic at play here shows itself through how the structure of the immediate context empowers some to benefit from the transition whilst putting others out of the power to adapt (De Boon *et al.*, 2021). In terms of the perceived justice of the transition, this is reflected in perceptions on the distribution of the costs and benefits related to bringing about the transition across the foundation. Specifically, are the principles that are used to decide who should bring up the costs to make the transition happen and who should benefit from the changes regarded as just (Bennett *et al.*, 2019; Rasinski, 1987)? In terms of the perceived legitimacy of the transition, this relates to whether people perceive that the goals of the transition are achievable given the specific foundational structure (Scharpf, 1999; Suchman, 1995).

Innovation process

The innovation process relates to the various generic structural stages that every kind of innovation process, including a transition, goes through, albeit on different scales, timelines, etc. These stages include: (1) problem and goal identification; (2) idea generation; (3) concept development; (4) concept testing; (5) implementation; and (6) monitoring and evaluation. They often overlap and feedback loops to previous stages do occur (Kline and Rosenberg, 2010; Sutherland *et al.*, 2012). These stages draw on the macro context and foundation and each of them forms an additional platform of power contestation: who is involved or excluded, whose interests are considered, who makes decisions, and on what grounds (De Boon *et al.*, 2021)? The way in which these stages take shape and how the power contestations manifest themselves at each stage form another anchoring point for the perceived legitimacy and justice of the transition. In terms of the perceived legitimacy of the transition, this relates to perceptions of whether the direction of the transition that is decided on in these stages is

the right direction for society to develop into (Suchman, 1995), whether the mechanisms that are chosen to bring about the transition are effective, fair, and acceptable (Scharpf, 1999), and whether stakeholders have been meaningfully included throughout each stage (Steffek, 2019). In terms of the perceived justice of the transition, this relates to perceptions of how the costs and benefits of each of the stages are distributed, both in terms of the specific mechanisms that are used for the distribution and the underlying principles that are used to decide who carries what portion of the costs and benefits, as well as perceptions on whether the right kind of costs and benefits are taken into account (Bennett *et al.*, 2019; Kaljonen *et al.*, 2021). It also relates to perceptions of whose interests are considered at what geographical and temporal scale in each of the stages, who is actively included and to what degree throughout each of the stages, what type of knowledge is used as input for the decisions in each of the stages, and how the individuals forming these perceptions themselves are impacted by the processes and outcomes of each of these stages (Martin *et al.*, 2016).

Governance system

Finally, the governance system reaches across and connects the macro, meso, and micro level and comprises the structures and procedures of decision making and implementation that are used in interactions between public and private actors involved in actively steering society into a certain direction (Lockwood *et al.*, 2010). Consequently, the governance system shapes all the transition processes and outcomes and thus forms a central platform through which the ethical implications of the political nature of a transition can be addressed and perceptions of legitimacy and justice can be taken into account. However, it is itself also embedded in, and part of, the political dynamics.

Lessons for governance

A preliminary analysis regarding how people form their perceptions of legitimacy and justice across each of the components of an agricultural transition suggest three key lessons for governance in order to address the political nature and resulting ethical challenges of agricultural transitions.

First, it has become evident that agricultural transitions are complex, multi-faceted processes and that the ways people form their perceptions of the legitimacy and justice of these processes are equally multi-dimensional. For governance arrangements to be able to take account of this, it is essential that the decision-making and implementation processes are not closed down or compartmentalized into sub-aspects that are considered in isolation of each other. There needs to be clear communication and cooperation across all governance levels. A decision and the way this decision comes about at one point in the transition process related to one sub-aspect will have implications for all the components of the transition and can influence perceptions of justice and legitimacy not only in that moment but also further down the line. It is therefore key that decision-making does not happen in siloes and that potential consequences of the decision, and the way the decision is made, are explored across all components of the transition.

Second, because perceptions of legitimacy and justice are multi-dimensional and normative themselves (Rasinski, 1987), for a transition to be conducted in an ethical manner that can capture diversity in perceptions, governance needs to allow this diversity to exist. Whilst it is necessary to set some priorities to move a transition forward (Meadowcroft, 2011), where possible, governance should aim to include and recognize diverse framings of the problem(s) that the transition is trying to address, allow for multiple transition pathways to occur, and examine where there is room for multiple goals for the transition to coexist. Where this room does not exist, an assessment of trade-offs between goals needs to be undertaken and win-win alternatives should be sought in a collaborative manner.

Section 1

Third, and finally, as a transition is a process that happens across a longer period of time with multiple different stages, perceptions on what is just and legitimate can change over the course of the transition, for example when consequences of earlier decisions become visible that were not anticipated beforehand. Decision-making processes that are perceived as legitimate and just for one stage of the transition may be perceived as illegitimate and unjust for another stage. Governance therefore needs to be flexible and adaptable to change course when perceptions change and perceptions need to be monitored throughout the transition to be able to pick up on changes early on.

Conclusions

To conclude, whilst it is widely acknowledged that there is a need for an agricultural transition, how this transition should look like and be brought about is contested. To capture this political nature of the transition and govern the transition process in an ethical manner governance needs to take account of, and allow for, diversity in perceptions. Taking time to examine differing perceptions, creating room for alternative pathways to coexist, exploring potential consequences of decisions and the way the decisions are made, and being flexible to adjust course when new insights change perceptions are central cornerstones toward socially sustainable agricultural transitions.

References

- Avelino, F., Grin, J., Pel, B. and Jhagroe, S. (2016). The politics of sustainability transitions. *Journal of Environmental Policy & Planning* 18(5): 557-567.
- Avelino, F. and Wittmayer, J.M. (2016). Shifting power relations in sustainability transitions: a multi-actor perspective. *Journal of Environmental Policy & Planning* 18(5): 628-649.
- Bennett, N.J., Blythe, J., Cisneros-Montemayor, A.M., Singh, G.G. and Sumaila, U.R. (2019). Just transformations to sustainability. *Sustainability* 11(14): 3881.
- Blattner, C.E. (2020). Just transition for agriculture? A critical step in tackling climate change. *Journal of Agriculture, Food Systems, and Community Development* 9(3): 53-58.
- De Boon, A., Sandström, C. and Rose, D.C. (2021). Governing agricultural innovation: a comprehensive framework to underpin sustainable transitions. *Journal of Rural Studies*, 89: 407-422.
- De Boon, A., Sandström, C. and Rose, D.C. (2022). Perceived legitimacy of agricultural transitions and implications for governance. Lessons learned from England's post-Brexit agricultural transition. *Land Use Policy*, 116, 106067.
- El Bilali, H. (2020). Transition heuristic frameworks in research on agro-food sustainability transitions. *Environment, Development and Sustainability* 22: 1693-1728.
- Geels, F.W. and Schot, J., (2007). Typologies of sociotechnical transition pathways. *Research Policy* 36(3): 399-417.
- Hebinck, A., Klerckx, L., Elzen, B., Kok, K.P., König, B., Schiller, K., Tschersich, J., Van Mierlo, B. and Von Wirth, T. (2021). Beyond food for thought – directing sustainability transition research to address fundamental change in agri-food systems. *Environmental Innovation and Societal Transitions* 41: 81-85.
- Kaljonen, M., Kortetmäki, T., Tribaldos, T., Huttunen, S., Karttunen, K., Maluf, R. S., Niemi, Jyrki, Saarinen, M., Alsmineen, J., Vaalavuo, M. and Valsta, L. (2021). Justice in transitions: Widening considerations of justice in dietary transition. *Environmental Innovation and Societal Transitions* 40: 474-485.
- Kern, F. and Howlett, M. (2009). Implementing transition management as policy reforms: a case study of the Dutch energy sector. *Policy Science* 42: 391-408.
- Kivimaa, P., Laakso, S., Lonkila, A. and Kaljonen, M. (2021). Moving beyond disruptive innovation: A review of disruption in sustainability transitions. *Environmental Innovation and Societal Transitions* 38: 110-126.
- Kline, S.J. and Rosenberg, N. (2010). An overview of innovation. In Rosenberg, N. (ed.): *Studies on science and the innovation process: selected works of Nathan Rosenberg*. World Scientific Publishing Co. Pte. Ltd., Singapore, pp. 173-203.

- Köhler, J., Geels, F.W., Kern, F., Markard, J., Onsongo, E., Wieczorek, A., Alkemade, F., Avelino, F., Bergek, A., Boons, F., Fünfschilling, L., Hess, D., Holtz, G., Hyysalo, S., Jenkins, K., Kivimaa, P., Martiskainen, M., McMeekin, A., Mühlemeier, M.S., Nykvist, B., Pel, B., Raven, R., Rohracher, H., Sandén, B., Schot, J., Sovacool, B., Turnheim, B., Welch, D. and Wells, P. (2019). An agenda for sustainability transitions research: State of the art and future directions. *Environmental Innovation and Societal Transitions* 31: 1-32.
- Leach, M., Bloom, G., Ely, A., Nightingale, P., Scoones, I., Shah, E. and Smith, A. (2007). Understanding governance: pathways to sustainability, STEPS Working Paper 2, Brighton: STEPS Centre.
- Lockwood, M., Davidson, J., Curtis, A., Stratford, E. and Griffith, R., (2010). Governance principles for natural resource management. *Society and Natural Resources*, 23(10): 986-1001.
- Martin, A., Coolsaet, B., Corbera, E., Dawson, N. M., Fraser, J. A., Lehmann, I. and Rodriguez, I. (2016). Justice and conservation: the need to incorporate recognition. *Biological Conservation* 197: 254-261.
- Meadowcroft, J. (2011). Engaging with the politics of sustainability transitions. *Environmental Innovation and Societal Transition* 1: 70-75.
- Ostrom, E. (2009). A general framework for analysing sustainability of socio-ecological systems. *Science* 325: 419-422.
- Pigford, A.A.E., Hickey, G.M. and Klerkx, L. (2018). Beyond agricultural innovation systems? Exploring an agricultural innovation ecosystems approach for niche design and development in sustainability transitions. *Agricultural Systems* 164: 116-121.
- Rasinski, K.A. (1987). What's fair is fair – or is it? Value differences underlying public views about social justice. *Journal of Personality and Social Psychology* 53(1): 201-211.
- Rothmund, T., Becker, J.C. and Jost, J.T. (2016). The psychology of social justice in political thought and action. In: Sabbagh, C. and Schmitt, M. (eds.). *Handbook of social justice theory and research*. Springer, New York, pp. 275-292.
- Scharpf, F., 1999. *Governing in Europe: effective and democratic?* Oxford University Press, Oxford, 244 pp.
- Steffek, J. (2019). The limits of proceduralism: critical remarks on the rise of 'throughput legitimacy'. *Public Administration* 97(4): 784-796.
- Suchman, M. (1995). Managing legitimacy: strategic and institutional approaches. *Academy of Management Review* 20(3): 571-610.
- Sutherland, L.A., Burton, R.J.F., Ingram, J. and Gotts, N. (2012). Triggering change: towards a conceptualisation of major change processes in farm decision-making. *Journal of Environmental Management* 104, 142-151.

4. Climate change, vulnerability of food systems and institutional transformations in Senegal

D. Gmür^{1*}, S. Felber¹, B. Owolodun², C. Ollier³, L. Camara⁴, A. Beye⁵ and T. Haller¹

¹Institute of Social Anthropology, University of Bern, Switzerland; ²Swiss Tropical and Public Health Institute Basel, University of Basel, Switzerland; ³Université Lyon 2, France; ⁴Institute Arciv, University Dakar Anta Diop, Senegal; ⁵Département d'Histoire de la Faculté des Lettres et Sciences Humaines de l'Université Cheikh Anta de Diop de Dakar, Senegal; desiree.gmuer@anthro.unibe.ch

Abstract

This paper deals with increasing vulnerability of food systems in Senegal and argues that this is not just an outcome of climate change but its intersection with changes in institutional conditions of local tenure systems of land and land related common-pool resources (CPRs). While these systems were enabling resilience before colonial times, they were formally undermined by the change to state property and subsequent changes after independence. This also affected the property and management rights of CPRs being food producing resources, thus building the base for many types of food and food security for local people. This contribution focuses on four case studies in the Senegal River Valley, the Boundou area, Bedik Country area and the Lower-Casamance. It looks at the historical development and institutional changes of the commons and how these impact local food systems and household nutrition as well as resilience/vulnerability thereof in the context of external effects such as agro-industrial developments, conservation, and climate change. We argue that although the areas are affected differently by climate change, their resilience against these changes depend on the way land and CPR tenure is still in local ownership or not, and the failure to recognize that conservation areas are not pure nature but cultural ecosystems. While in the Senegal River as well as in the Boundou and Bedik Country area, there are restrictions due to agro-industrial and conservation developments, the Lower-Casamance seems to be still more resilient. However, this area has also undergone institutional changes, especially in social relations which undermine the maintenance of the cultural landscape. This is shaped by labour-intensive traditional rice and fishery infrastructure which cannot be maintained because of lack of family labour due to outmigration by men and youth. This underlines the argument that food vulnerability is not just an effect of climate but as well of institutional change of land tenure and social relations.

Keywords: food security, resilience, land tenure change, environmental change, crises

Introduction

This paper examines four different food systems in Senegal – *Bedik Country area*, *Lower Casamance*, *Senegal River Valley* and *Boundou area* – to show the historical evolution and institutional changes of the commons and how these impact on food security in the context of external crises such as climate change, conservation and agro-industrial developments. Food security is conceptualized as ‘physical and economic access to sufficient, safe, and nutritious food to meet the dietary needs and preferences of all people for an active and healthy life’ (FAO, 1996). It has four main dimensions – availability, accessibility, utilization, and stability – linked to external effects. The food system is generally defined as ‘the set of food-related activities and the political, socioeconomic and natural environment in which these activities take place’ (Pinstrup-Andersen and Watson, 2011). It’s comprised of food production, distribution, preparation and consumption. Maintaining or achieving a resilient food system requires

access to CPRs. Local community resilience to food insecurity provides a perspective for understanding the capacity to cope with recurrent stresses, unexpected shocks, and hazards in socio-ecological systems and, in particular, the livelihood dynamics of resource-dependent rural populations (Berkes *et al.*, 2003). This paper adopts a New Institutional Political Ecology Perspective (NIPE) (Haller, 2019), combined with an intersectional perspective. An actor-oriented approach in NI focuses on actors and looks at how external effects shape the internal bargaining power of actors and ideologies and then shapes the institutional choice (incl. institution shaping) and distributional effects regarding resources for different actors. PE focuses on resource use, access and control, i.e. on how the management of CPRs involved in specific food systems is shaped by political processes and power relations involving different actors with different levels of power. An intersectionality framework looks at how the combination of social and political identities (such as gender, age, ethnicity, status, class, religion, etc.) creates different forms of disadvantage and advantage within the food system (Cooper, 2016; Holley, 2016; Runyan, 2018; Zinn, 1996).

The data for this paper was collected between January and August 2021, using mainly qualitative methods in all the case studies such as participant observation, informal conversations, diary keeping, biographies, semi-structured interviews, and focus group activities. Participant observation is one of the core instruments as it produces experiential as well as effective positivistic knowledge. By taking part in the daily activities of local people, the aim was to help them in doing their living, which means helping them with agriculture, fishery or cattle-breeding (animal husbandry), firewood collection, and cooking (asking about specific recipes). Daily diary keeping was used to get the impressions of the livelihood strategies in each study area that they are pursuing and the social structure. Furthermore, there were open interviews and questions with elderly men and women from different social backgrounds (e.g. fishermen, pastoralists, rice farmers, and others). The interview questions were modified based on factors related to each location, but they remained consistent with the overall theme. A trained research assistant/translator aided in all interviews and discussion, which were conducted primarily in French and local languages Pulaar, Jakhanke, and Mènik. In addition, focus group activities were conducted with women since they are in charge of food preparation.

Land tenure and CPR institutional changes in Senegal – national policies on food security

In Senegal traditional land and CPR management systems, based on flexible and locally adapted systems, have first been displaced by a colonial system of private land ownership, especially in urban centres. Land and land related resources became de jure state property, however in rural areas remained de facto common property of ethnic groups. Customary rules were respected but not enforced by documented rights. However, the rural situation regarding CPR management began to change in 1935 with the establishment of many protected areas (PAs), which aimed to limit the use of natural resources. After independence in 1964, a new land regime virtually turned all land into state property, with usufruct rights of farmers. The same happened to all other natural resources (Monkam, 2009; Bruce *et al.*, 1995). Thirty years later, decentralization laws were enacted. Responsibility for managing public land was in the hands of local elites but was still state property, resulting in severe restrictions on rural management of public land. This was followed with the evolution of the country's agrarian production and food security policies. Nationalization of agricultural marketing led farmers into dependency and resulted in a quest for agricultural modernization under the Green Revolution. One of the state's responses to severe droughts was the introduction of rice cultivation. The focus of production shifted from peanuts to new rice varieties with the goal of improving food supply based on sovereignty over rice. Ironically, this led to an intensification of agricultural exportations. Increased investment in the mining sectors and agro-industrial projects followed, very often on previously communal land.

Case studies

Transformations of food systems in the context of climate change, agro-industrial developments and conservation in the Senegal River Valley

In the areas of Fanaye and the Ndiel and Nayré Reserves, resources traditionally belonged to spirits that allowed people to use them, adapted to the ecosystem of the river (floodplains), and being common property of ethnic groups (Fulani, Soninké, Maures, Wolof). The traditional agricultural system involved cropping, fishing and grazing of livestock, all symbiotic activities being oriented towards the flood. Agriculture (millet and sorghum) was rain-fed and based on *jeery* (sandy) and *waalo* (floodplains) production. This strengthened food security of the different groups, and reduced vulnerability of local food systems. However, the delta has been one of the target areas of irrigated rice production, which is done mainly in the floodplains, supported by dam construction, involving land redistribution and changes in CPR institutions. Agriculture in the *jeerys* has become difficult due to the weather changes (impacting the rains and Ndiel wetland). Millet thus became scarce in the area. The villages in the area of the reserves additionally have been affected by the establishment of the PAs as well as by an agro-industrial project (Senhuile). All changes resulted in reduced access to grazing land (drying pastures, expulsion from Ndiel reserve) especially for Fulani herders, to forest products (firewood, Arabic gum trees, fruit trees), to fish (change of ecology of the river due to dam, overfishing) and to farmland, especially for people who formerly cultivated land in the *jeerys*, unsuitable for rice cultivation. Cattle now has to be moved far away from the villages, which temporarily reduces availability of meat and milk and lead to prices increase. Even though some people within the communities have benefitted from the rice production, especially *waloo* land owners organized in farmer unions, other more marginalized groups (nomads, pastoralists, poorer, land-less people, women, especially nomadic women) face problems to secure food access. Coping strategies such as the picking of the leftover rice that drops from the machine after the harvests, working as laborers in the fields of rice cultivators, and female outmigration to Mauritania do not make up for the losses these people have experienced due to institutional transformations and climate change, nor do they enhance food security in a substantial way. On the contrary, vulnerability of already marginalized groups has increased.

Interplay between conservation, food sustainability and social capital in Bedik country area

The Bedik Country area is situated in south-east Senegal between the Niokolo-Koba National Park (NKNP) and Guinea. The national park which was established during colonial times was designated an UNESCO biosphere reserve in 1981 and listed as an endangered World Heritage Site in 2007 mainly due to grazing and poaching. In addition to the NKNP, the Bedik cultural landscape has also been considered an UNESCO World Heritage Site since 2012. According to the legends of elderly people from the investigated villages Bandafassi, Iwol and Manda-Thiès, the spirits used to allow people to use the natural resources available to them. Nevertheless, the interaction of Bedik people with their environment is nowadays severely affected by park policies in the form of restrictions on natural resource management leading to a loss of access to these cultural landscapes. Local food systems evolved from hunting and gathering to subsistence agriculture and subsequent cash crop cultivation. Despite this transition, bushmeat remains an important source of protein and hunting contributes to local food security and serves as a coping strategy particularly during the dry season. Although conservation policy claims to be participatory, the local population is either excluded from natural resource management or participation is hindered. Obstacles include a lack of comprehensive information on park legislation; strict gun and ammunition laws; and permits not adapted to local needs. This opens the door to corruption, reinforces the power dynamics characterized by the dependence of the local population on park rangers, and increases the insecurity of the communities regarding their rights. To cope with the

current food supply situation, local hunters turn into 'poachers' and 'spies'. As a result, certain activities including hunting, fishing, and gathering natural resources are done in secret. This contributes to changes in community institutions, changes in distribution patterns, and a loss of social capital, which is founded on trust and reciprocity. Various studies show that social capital improves food security by sharing knowledge and products and supports coping strategies following food-related shocks and hazards. Interactions among community members lead to a reciprocal exchange of food and information that can improve the sustainability and resilience of the local food system (Nosratabadi *et al.*, 2020). However, the lack of transparency in conservation regulations of the NKNP undermines such exchanges, to the benefit of corrupt strategies that only benefit individuals while increasing the community's overall food vulnerability.

Gains and losses of food options by conservation in the Boundou area

This case study draws from the experience of the Boundou people in Koussan (Fulbe/Fulanis) and Dide (Diakhanké/Jakhankes) villages in the dryland area of eastern Senegal. Agro-pastoralism is the main livelihood strategy especially among the Fulbe. People have subsisted today and in the past by cultivating different types of millets, peanuts, cotton, maize, and as well as the herding of cattle and other livestock. These livelihoods are subject to various external influences, such as climate shock and restrictions enforced with the area becoming a PA in 2009. One significant loss is of pasture use. People have expressed concerns about the availability and quality of fodder or pastures, as they are no longer permitted to graze within this PA and thus affecting their livestock production and, consequently, milk production. Sometimes people have to hire a herder from neighbouring villages to move their cattle far away from the villages to graze especially during the dry season. As a result, the declining forage base can therefore lead to rising household malnutrition. Another loss is the ban on hunting, which has always been part of the livelihood strategies in the past as bushmeat was the main coping strategy in the dry season. On the other side, it appears that the region has benefited from its designation as a PA. As there is free access to gather and collect wild fruits such as baobab fruits within the PA, it contributed to food security by allowing the population to access these nutritious foods when they may not have other sources of sustenance. It appeared that the rules guiding the collection of these wild fruits were not negotiated with local people. It is not clear yet how much broader local involvement was in the creation of the reserve. This question matters specially as, in the present time, especially during the dry season when there are shortfalls in agricultural crop production, a majority of the population depends on the gathering, processing, and sale of baobab fruits from woodlands. The commodification of these wild fruits brings essential cash income to many households, which can be used to purchase food, thereby improving food security.

Maintaining traditional rice production while increasing gendered workload in Casamance

In Lower-Casamance region of Oussouye, climate and environmental changes, as well as socio-economic changes (mainly migrations) have combined to transform the local rice food production and landscapes. While such rice production remains central for the Diola group studied, the number, skills and motivations of the labour force as well as the quantity and quality of arable land have undergone major changes, reshaping the landscapes and social habits. In this context, the main food production of the group, once a shared task between men and women, elder and younger, now seems to lie in the hands of few people, mainly the older women. Though the methods are still completely manual, still use the same tools (notably the *kayendo*, a ploughing shovel made of wood and iron) and do not use any mechanized process, rice production in the region should be regarded as a capacity to adapt agricultural knowledge to climate and environmental changes. This is the main reason why the rice production can carry on nowadays, even if it is facing constraints and difficulties. It is not so much climate change but internal changes of work collaboration institutions which pose a problem in the long run for food

Section 1

resilience. While there is a local discourse of rice being 'food for the soul' it is now left with the women to have a particular part to play in the conservation of the practice: they master what rice varieties can be transplanted to the lands that are more drought, more salty, drier, etc. Their knowledge is the result of what they were taught by their mother, aunts, grandmothers, but also of their daily experience of the environments, of the landscapes and of the climate. Our data shows how they transform their long-term observations, but also their beliefs and habits into agricultural practices in terms of crops selection. The local diversity of rice crops remains one of the most important adapting strategies for rice producers and is often the most efficient strategy of *adaptation* rather than one of *resistance*. The Diola farmers all said so: they cannot 'win against the sea', whose salty waters invade the rice lands. This is also the case because elderly women face the internal institutional change of not being supported by work force from other family members, especially young men and women who leave to the urban areas for school and work and elderly men also for salaried jobs. They thus leave the workload of reproducing the cultural landscapes to the elderly women. For them the only coping strategy is to try to maintain the crop diversity as they 'cannot command the rains as God, the sky, is the one that decides of it'. Thus, institutional labour changes seem to dominate this case study.

Conclusions

Climate change alone does not undermine resilience of food systems and does not trigger local populations to food insecurity. Past and present institutional transformations and changes weakening local land and CPR rights play an important role regarding the effects of external crises (such as climate change). Thus, the interplay of external crises and changes and local tenure systems is central in increasing the vulnerability of local food systems and reducing their resilience. In Senegal, land tenure changes from common to state and 'private' property in a neoliberal context in the form of the establishment of PAs. New agricultural policies and agro-investments act as a state-response to climate change, drought, and biodiversity loss and have triggered institutional changes in access to food, increasing food vulnerability, especially in marginal groups. In the *Senegal River Valley*, agro-industrial investments and the establishment of PAs initiated a neoliberal response to climate change but also initiated climate change itself, which has, in return, undermined previous commons institutions and reduced access to land and CPR, at the expense of marginalized people and women. In the *Bedik Country* climate change presents itself as increased droughts and unpredictable and shorter rainy seasons. Aside from the uncertainty of the harvest quantity, continuous wildlife migration into conservation areas is observed. This, as well as the restrictions of access to CPRs puts local population in a precarious position in terms of food resilience. On one hand, people are forced into applying corrupt coping strategies which causes institutional changes. On the other hand, this tension weakens reciprocity as a form of social capital based on trust, which leads to the undermining of coping strategies based on the reciprocal exchange of food and information, and ultimately limits the ability to resist external factors such as climate change. In the *Boundou area*, restriction of access to previous commons (pasture, wildlife and forestry) reduces resilience among Fulbes and Jakhankes during times of climate change, however, a new alternative of seasonal usage of fruits (baobab) for commercial purposes has emerged. It is uncertain whether it is reducing food vulnerability and increasing resilience of households and more marginal groups (e.g. women) or whether it does not compensate for the 'green commons grabbing'. In the *Lower Casamance area* climate change contributes to loss of land due to salinization. But it is rather the lack of workforce to maintain the rice fields and ponds which is left to the elderly women because of institutional changes in the social and work/labour relations within the households. Local rice production is extremely important but left to the weakest work force, which undermines the resilience in food production. The only coping strategy is maintaining crop diversity while unlike the other cases there is now institutional change in tenure so far.

We conclude that climate change transformations are falling on already weakened local institutional settings, which have been undermined in different ways: from tenure related issues such as colonial and neo-colonial commons grabbing (conservation and large-scale investments) to changes in social relations of sharing and of work. The latter reduces the social capital of actors – especially for the poorer groups and women – needed for resilient food production and food diversity. Not all areas are affected in the same way by these colonial, postcolonial and neoliberal tenure and social relations transformations. But these long-term historical changes nevertheless strongly weaken local common property and social institutions, which were set up to buffer situations of crisis and vulnerability. However, local actors also develop different strategies (compensation schemes, commodification of wild fruits, maintaining local crop diversity) to cope with situations of crisis and select coping strategies regarding their bargaining power, thus opposing the strategies of the state, local elites and international capitalist groups in food production and conservation businesses.

References

- Bruce, J. W. *et al.* (1995). Senegal: rural communities. In *Old Wine in New Bottles: creating new institutions for local land Management*. Ed. GTZ, 13-17. Eschborn: GTZ.
- Cooper, B. (2016). Intersectionality. In: Disch, L. and Hawkesworth, M. (eds.). *The Oxford Handbook of Feminist Theory*. Oxford University Press: pp. 385-406.
- Ensminger, J. (1992). *Making a market. The Institutional Transformation of an African Society*. Cambridge: Cambridge University Press.
- Haller, T. (ed.) (2010). *Disputing the Floodplains. Institutional Change and the Politics of Resource Management in African Wetlands*. African Social Studies Series, Vol 22.
- Haller, T. (2019). Towards a new institutional political ecology: how to marry external effects, institutional change and the role of power and ideology in commons studies. In: Haller, T. *et al.* (eds.) (2019): *The Commons in a global world: global connections and local responses*. New York: Routledge.
- Holley, L.C. *et al.* (2016). Heterosexism, racism, and mental illness discrimination: experiences of people with mental health conditions and their families. *Journal of Gay & Lesbian Social Services*. 28 (2): 93-116.
- Monkam, N. (2009). *Property Taxation in Francophone Africa 1: Case Study of Senegal*. Working Paper, WP09FAA3 Lincoln Institute of Land Policy.
- Ndiawar, D. and Soulye, N. (2012). An analysis of international law, national legislation, judgements, and institutions as the interrelate with territories and areas conserved by indigenous people and local communities. Report. No. 5, Senegal. *Natural Justice in Bangalore and Kalpavriksh in Pune and Delhi*.
- Nosratabadi, S., Khazami, N., Abdallah, B., Lackner Z., Shahab, B., Mosavi, A. and Mako, C. (2020). *Social Capital Contributions to Food Security: A Comprehensive Literature Review*. *Foods* 9, no. 11: 1650.
- Pinstrup-Andersen, P. and Watson II, D. (2011). Chapter 1. *Toward a dynamic global food system*. In *Food policy for developing countries: the role of government in global, national, and local food systems* (pp. 1-25). Ithaca, NY: Cornell University Press.
- Runyan, A.S. (2018). What is intersectionality and why is it important? *Academe*. Vol. 104, No. 6. American Association of University Professors.
- Zinn, M.B. and Dill, B.T. (1996). Theorizing difference from multiracial feminism. *Feminist Studies* 22 (2): 321-331.

5. Taking value-landscapes seriously

M. Kaiser

University of Bergen, Centre for the Study of the Sciences and the Humanities, Parkveien 9, 5020 Bergen, Norway; matthias.kaiser@uib.no

Abstract

This is a conceptual paper around the concepts of values and food identities. As such it is by necessity embracing value pluralism, recognizing the diversity in democratic societies. It is based on the metaphor of value-landscapes, introduced by the author in an EU project in 2009. It is furthermore based on the idea that our study of values and food identities should connect the conceptual analysis of values and food identities to the empirical study of these concepts as they are to be detected in society. Admittedly, there is a plethora of theories and studies of values both in philosophy and in the social sciences, with the conception of Schwartz appearing as the dominant one. The author is critical of these attempts and argues that they apparently fail on conceptual and empirical grounds. There is no definite list of (describing) all possible values held by people; all lists are in an important sense incomplete, but some lists are sufficient given a context and the people. The paper proposes an approach based on the multi-dimensionality of values. The following insights are crucial: (1) values relate to each other in terms of proximity; (2) different values may exhibit different intensity (defining peaks in the landscape); (3) each value acquires various meanings dependent on from where it is perceived (contextuality); and (4) values have an inertia but are malleable over time, particularly in interaction with belief states. It is argued that such a multi-dimensional approach offers a better foundation to regional food identities. These, in turn, are then viewed as cornerstones in an empirically anchored food ethics. Here the author recalls his definition of food ethics, as: the empirical study and normative reflection of pro-social attitudes and value trade-offs pertaining to all kinds of food (animal, terrestrial, aquatic food, etc.) and held by various stakeholders and citizens all along the global value chain (from producer to consumer). Food identities provide the link between these value-landscapes and the normative commitments associated with them.

Keywords: food ethics, values, value-landscapes, value pluralism, food identity

Introduction: what is the topic?

Food ethics deals obviously with ethical issues about food. Yet, it is not always quite clear how we identify ethical issues in relation to food, and if we do, how do we deal with them? This difficulty is in part due to the fact that different people associate different meanings when confronted with the term ‘ethics’. Some such associations are quite restricted in scope, as e.g. basically comprising a list of ‘what-not-to-do’, while others apply a more liberal understanding as basically comprising all kind of socio-cultural aspects which are not mere facts or based on economic valuation. In my experience, many natural scientists seem to have this latter very liberal understanding. The first version may just be too limited, while the latter one may just be too liberal to be useful. I tend to apply the following working definition of food ethics: ‘the empirical study and normative reflection of pro-social attitudes and value trade-offs pertaining to all kinds of food (animal, terrestrial, aquatic food etc) and held by various stakeholders and citizens all along the global value chain (from producer to consumer)’ (Kaiser and Algers, 2016). Apparently, values of a certain kind matter for ethics.

It is convenient to differentiate between two uses of values: Values can acquire a *deontic* meaning as something that is right or wrong, or they can be understood as *evaluative* terms which rests on something

being good or being bad. The former use is typical for normative discourse e.g. in metaethics, while the latter is the reign of what has been termed axiology, the domain of the good. As a working hypothesis I embrace the notion that the evaluative use of values is constitutive of ethics in the Aristotelian sense of outlining the essential features of a good life, while the deontic use of values emerges as a sub-domain of the evaluative uses. Given a certain axiology and a specific evaluation of something as good, certain actions emerge as instrumental to achieving a given end or counter-acting this end, and thus are judged as right or wrong.

An important task in food ethics is the discussion of what kind of food futures we want to work towards. The design of possible and positive food futures is central to develop policy strategies for all actors involved in the global food chains. With the above deliberations on the relationship between ethics and values, I have made values a central concern for our analyses of food futures. This analysis is both conceptually, i.e. philosophically, and empirically grounded. I will say more on the empirical basis for the analysis in the remainder of the paper. First my conceptual entry point.

For this article, I present here my pragmatic working definition (adapted from the *Value Isobars* project 2009-11; <https://cordis.europa.eu/project/id/230557>) as follows:

Values are reference points for evaluating something as positive or negative. Values are often rationally and emotionally binding and they give long-term orientation and motivation for action.

Many disciplines would buy-in to this working definition. However, they would then easily differ on more specific points². In this paper, I want to sketch what I perceive as basic elements of value-landscapes and the consequences of it. Before continuing with this task, it might be useful to relate this to ethical principles. Principles are defined as: *'Principles are normative statements that are meant to guide action without prescribing specific actions. All applications of principles need to be contextually embedded and interpreted'*. In practical ethics, 'principlism' has led to such practical ethics tools as the ethical matrix, which has been widely discussed in EurSafe. The development of the ethical matrix by Ben Mepham in the mid-1990s transformed the 'Georgetown Mantra' into a volatile tool applied to a greater variety of cases (Mepham, 1996, 2005). The undersigned and co-workers have later developed the ethical matrix further (Kaiser, 2005, 2006; Kaiser and Forsberg, 2001; Kaiser *et al.*, 2007; Oughton *et al.*, 2004; Forsberg, 2007). I want to state that I maintain the practical utility of the ethical matrix, while I also see the study of values as the more foundational task, and in effect as empirically more adequate in complex societal settings.

How do values relate to attitudes and action?

Even though values are commonly conceived as providing some motivation for action or as providing the background for attitudes, this is not a straightforward relationship. For some philosophers and ethicists, notably Richard M. Hare (Hare, 1987), values are inherently motivational. The trouble with the motivational view on values is that it just does not seem to be reasonable in the light of how people actually feel and act: values appear typically *post-hoc* in rationalizations of action, while they seldom have predictive powers. For instance, I value my health and I know it is not good to smoke, but I may still on occasion succumb to my desire to have a smoke. Or I may be an easy prey to the elegant looks of this new luxury car, while I may then *post-hoc* justify my purchase of it through reference of the beneficial quality-price relationship.

² In this paper I shall not discuss other types of values, as e.g. aesthetic values about the features of beauty.

Section 1

In order to have a more realistic view on the relationship of values to action and attitudes, it is useful to recall the classical philosophical view on explaining action (with possible origins from Aristotle and Augustin, but mainly developed through Leibniz and Kant; cf. Hilgard, 1980). The analysis of human action is described as comprising three essential aspects: (1) the *cognitive* – what we know; (2) the *affective* – what we feel and desire; (3) the *conative* – what we aspire to, what we value. It is therefore important to combine the different drives to action, attitudes and behavioural change. What emerges is the complexity of the interaction between these three mostly independent functions.

Some of our actions will be mostly driven by cognitive factors. The cost-benefit analysis, or the game-theoretic approach used in modern day economics, is based on this feature. We may call this the ‘rational’³ approach to action which in essence presupposes conscious deliberations of pros and cons. However, other actions may not be introduced by these deliberations, but may simply follow ‘fast and frugal’ (Kahnemann, 2017; Gigerenzer, 2008) decision patterns. Actors can be viewed as mainly driven by cultural norms (Frese, 2015), heuristics, by automatic emotional impulses, rule-based behaviours, without overt rational contemplation of options. Impulses and rules-of-thumb play a role here. Thirdly, actors may engage in planning decisions, outlining a path for their future action and development (Friedman, 1967). My claim is that values are underlying all three of these approaches to understand actions and the formation of attitudes. Without at least some implicit reference to values, none of these makes sense.

Modern psychology has placed a stress on cognition, resulting in cognitive psychology (Hilgard, 1980), while more recent literature has examined emotions as drivers for action (Elster, 2017). Social psychology, however, has attempted to empirically study human and social values.

Studying values empirically

The major innovation in large-scale empirical approaches came with the social psychologist Milton Rokeach (1973), who introduced value research as a potent alternative to the then dominant behaviourism in psychology. He named values, based on intuition, briefly explained their meaning, and asked people to rank them. With Rokeach, the distinction between instrumental values and terminal or final values was stated (Rokeach, 1973; Rohan, 2000). While this gave interesting results, it was not powerful enough to predict the probabilities for concrete preferences and actions. This was improved first by Ronald Inglehart (1977, 1990, 1997), and later by Shalom Schwartz’ value-theory (1992, 2016). Schwartz focused on the motivational concerns embodied in each value, which structure a value system. Where Inglehart operates with the basic opposition between *materialism vs post-materialism*, later also *traditional vs secular-rational* modes, Schwartz operates with *self-transcendence vs self-enhancement*, and *openness-to-change vs conservation*. The 10 basic universal values identified by Schwartz within the ensuing circumplex are: security, conformism, tradition, benevolence, universalism, self-direction, stimulation, hedonism, achievement, and power. Strong weight on one side of one axis implies lesser weight on the opposite side.

There is a wealth of literature on these approaches, but I merely want to point to some principal difficulties as identified by Spates (1983). One problem is the non-falsifiability of these approaches. ‘[T]he researcher knows what to look for beforehand and imposes certain categories of response upon the empirical situation ... Observable reality is forced into accord with a preconceived model’ (Spates, 1983, p. 34). There is also the problem of abstraction. This concerns the immunization from falsification through increased abstraction. ‘With the distinction between values and norms ..., values were said to be neither situation-specific or function-specific. Ironically, their ‘power’ in shaping social life became

³ I do not want to imply that other approaches are irrational, but simply mark a common usage of the term ‘rational’ here.

even greater. Values were at the peak of the cultural 'cybernetic hierarchy of control'; they 'controlled' norms, and norms 'controlled behavior' (Spates, 1983, p. 35). A good critique was stated by Stavroula Tsirogianni and George Gaskell (2011). They state: 'In essence, the post-Rokeachean landscape of studies in values, assumed coherence, stability, homogeneity and universality in value structures, and ignored individuals' capacity to boast a plural value system' (Tsirogianni and Gaskell, 2011, p. 455).

The common assumption that the set of all values is finite, fixed and universal is not tested critically, but simply assumed in these studies. This is why I opt for a bottom-up approach to study what I call value landscapes.

Value landscapes

The metaphor of a value landscape is meant to convey the following complex of insights: (1) values relate to each other in terms of proximity; (2) different values may exhibit different intensity (defining peaks in the landscape); (3) each value acquires various meanings dependent on from where it is perceived (contextuality); and (4) values have an inertia but are malleable over time, particularly in interaction with belief states. In effect, values in value-landscapes are construed as multi-dimensional entities, highly dependent on context of use. One has to break through the simple idea of the direct and one-dimensional representational character of value-terms. To assume that a given value, say privacy, retains the same characteristics and reference across various contexts of uses, does not seem promising. Instead, one would have to work-in multiple factors which together embrace the meaning of the term. One such factor could be context-dependent scope. Sometimes privacy may denote sheltering aspects of my life from just anybody, as is typically the case with diaries. Other times, it may shelter selected aspects of my life from specific users who may misuse this against my interests, as e.g. not making records of my health available to potential or actual employers, or when I resent making the contents of my luggage visible to co-travellers in a border control.

Furthermore, my values may trigger different affective states, and be felt with different intensity. Dignity and respect towards myself and towards others in my community may be accompanied by strong feelings. Cultural roots may be responsible for that, or personal experiences. In many indigenous cultures respect apparently figures as the number one value (Lam *et al.*, 2019), overriding autonomy. Thus, affective intensity may be another factor to determine different shades of my values.

An additional factor could be shadings influenced by context-dependent neighbourhood relations. For instance, privacy concerns are often contrasted to security concerns, as e.g. in security checks at airports, where many of us apparently let security concerns trump privacy. However, sometimes I may distrust the confidentiality of the party who receives my private information, or suspect that other external motives are behind their look into confidential matters, e.g. commercial or political interests. Authoritarian regimes sometimes pretend security interests of their citizens when invading privacy. Thus, (dis-)trust in beneficial intentions may override my security interests.

Taking value-landscapes seriously

What is the advantage of taking value-landscapes seriously, and accepting the multi-dimensionality and contextuality of values in relation to food ethics? I see two important advantages here.

First, values are seen as a defining element of people's identity. Who we are and who we want to be are seen (in part) as functions of our value-landscapes. In general, people adopt a variety of personal and social identities, as family, as neighbours, as citizen, as members in social networks, etc. (Lam, 2021). Food identities would be those perceptions of identity which relate to our foodways, as consumers, as

Section 1

producers, and as moral actors in relation to those with whom we share food. They can be influenced by tradition, early experiences from childhood, or by our locality and culture. Mapping value-landscapes can give us valuable insights into these food identities.

Second, the concept of value-landscapes makes values better suited for empirical investigation, and mapping societal and cultural differences between people. It avoids viewing values as truisms (Maio and Olson, 1998). It also avoids approaches based on simple value tradeoffs. Tradeoffs occur in markets based on units of a common measure, something that is not assumed if values are multi-dimensional. Furthermore, it invites mixed methods design for our empirical studies, recognizing the inherent limitations in singular approaches when dealing with complex units. This may include the combination of quantitative with qualitative methods, and various methods focusing on individuals and on group processes (scenario workshops, etc.). Using surveys, interviews and scenario workshops in an EU project among aqua-culturists in four Asian countries (the SEAT project; cf. seatglobal.eu), gave interesting results in the different value-landscapes among the four countries (Bremer *et al.*, 2012; 2013; 2014). Those differences also accounted for the informants' preferences for the futures they were striving for.

In short, I believe that taking value-landscapes seriously may boost our food ethics and may be conceptually better founded than existing approaches.

References

- Bremer, S, Haugen, A.S. and Kaiser, M. (2012), 'Mapping core values and ethical principles for livelihoods in Asia. In: T. Pothast and S. Meisch, Climate change and sustainable development – Ethical perspectives on land use and food production. Wageningen Academic Publishers: Wageningen. pp. 419-424.
- Bremer, S., Haugen, A.S. and Kaiser, M. (2013), 'Whose sustainability counts? Engaging with debates on the sustainability of Bangladeshi shrimp', in: H. Röcklinsberg and P. Sandin (eds.), *The ethics of consumption: The citizen, the market and the law*, Wageningen Academic Publishers: Wageningen.
- Bremer, S., Johansen, J., Øyen, S., Kaiser, M., Haugen, A.S. (2014), 'Mapping the ethical terrain of Chinese aquaculture', in: C. Brautaset and C.M. Dent (eds.), *The Great Diversity: Trajectories of Asian Development*, Wageningen Academic Publishers, Wageningen.
- Brosch, T. and Sander, D. (Eds.). (2015). *Handbook of value: perspectives from economics, neuroscience, philosophy, psychology and sociology*. Oxford University Press.
- Elster, J. (2011/2017). Emotions. In: *The Oxford Handbook of Analytical Sociology*. P. Bearman and P. Hedström (eds.); <https://doi.org/10.1093/oxfordhb/9780199215362.013.3>
- Forsberg, E.M. (2007). Pluralism, the ethical matrix, and coming to conclusions. *JAEE*, 20(5), 455-468.
- Frese, M. (2015). Cultural practices, norms, and values. *Journal of Cross-Cultural Psychology*, 46(10), 1327-1330.
- Friedmann, J. (1967). A conceptual model for the analysis of planning behavior. *Administrative Science Quarterly*, 225-252.
- Gigerenzer, G. (2008). Why heuristics work. *Perspectives on psychological science*, 3(1), 20-29.
- Hare, R.M. (1987) *Moral thinking: its levels, method, and point*. Oxford: Clarendon Press.
- Hilgard, E.R. (1980). The trilogy of mind: Cognition, affection, and conation. *Journal of the History of the Behavioral Sciences*, 16(2), 107-117.
- Inglehart, R. 1977, *The Silent Revolution*, Princeton: Princeton University Press
- Inglehart, R. 1990, *Culture Shift in Advanced Industrial Society*, Princeton: Princeton University Press
- Inglehart, R. 1997, *Modernization and Post-Modernization*, Princeton: Princeton University Press
- Kahnemann, D. (2017). *Thinking, fast and slow*. Farrar, Straus and Giroux, New York.
- Kaiser, M. (2005), 'Assessing ethics and animal welfare in animal biotechnology for farm production', *OiE, Scientific and Technical Review of the World Organisation for Animal Health (Rev.sci.tech.Off.int.Epiz.)* 2005, vol. 24 (1), 75-87.
- Kaiser, M. (2006), 'Practical ethics in search of a toolbox: ethics of science and technology at the crossroads', in Gunning, Jennifer and Søren Holm (ed.) 2006: *Ethics, Law and Society Vol.II*, Ashgate Publishing Ltd: Cardiff, pp. 35-44.

- Kaiser, M. and Algers, A. (2016). 'Food ethics: a wide field in need of Dialogue', *Food Ethics*, vol 1 (1), pp. 1-7.
- Kaiser, M. and Forsberg, E.-M. (2001), 'Assessing Fisheries – Using an Ethical Matrix in a Participatory Process.', *Journal of Agricultural and Environmental Ethics*, 14: 191-200.
- Kaiser, M., K. Millar, E. Thorstensen and S. Tomkins (2007), 'Developing the ethical matrix as a decision support framework: GM fish as a case study', *JAEE*, vol.20, 65-80.
- Lam, M.E. (2021). United by the global COVID-19 pandemic: divided by our values and viral identities. *Humanities and Social Sciences Communications*, 8(1), 1-6.
- Lam, M.E., Pitcher, T.J., Surma, S., Scott, J., Kaiser, M., White, A.S., Pakhomov, E.A. and Ward, L.M. (2019). Value-and ecosystem-based management approach: the Pacific herring fishery conflict. *Mar Ecol Prog Ser*, 617, 341-364.
- Maior, G.R. and Olson, J.M. 1998. 'Values as truisms: Evidence and implications.' *Journal of Personality and Social Psychology*, 74 (2), 294-311.
- Mepham T B (1996): Ethical analysis of food biotechnologies: an evaluative framework, in *Food Ethics*, edited by T B Mepham, Routledge, London. pp. 101-119.
- Mepham B. (2005). *Bioethics: An Introduction for the Biosciences*, Oxford: Oxford University Press.
- Oughton, D., Forsberg, E.-M., Bay, I., Kaiser, M. and Howard, B. (2004). 'An ethical dimension to sustainable restoration and long-term management of contaminated areas', in: *Journal of Environmental Radioactivity*, Vol. 74, Issues 1-3: 171-183, Elsevier.
- Rohan, M.J. 2000, 'A rose by any name? The values construct'. *Personality and Social Psychology Review*, 4:255-277.
- Rokeach, M. 1973, *The Nature of Human Values*, New York: Free Press.
- Schwartz, S.H. (1992), 'Universals in the content and structure of values: theoretical advances and empirical tests in 20 countries', in M. Zanna (ed.), *Advances in Experimental Social Psychology*, vol. 25, New York: Academic Press.
- Schwartz, S. 2016. 'Basic individual values: sources and consequences'. In: Brosch and Sander eds. 2016.
- Spates, J.L. 1983. 'The sociology of values', *Ann.Rev.Sociol.* 9:27-49.
- Tsirogianni, S. and Gaskell, G. 2011. 'The role of plurality and context in social values', *Journal for the Theory of Social Behaviour* 41:4 p. 441-465.

6. What is (not) the point of just transition in food systems?

T. Kortetmäki

Department of Social Sciences and Philosophy, University of Jyväskylä, P.O. Box 35, 40014 Jyväskylä, Finland; teea.kortetmaki@jyu.fi

Abstract

Food systems are confronted with a low-carbon transition challenge. The need for significant emission reductions in industrial food systems implies significant systemic transformations in food production, processing, and consumption. The wide-reaching impacts of such transformations have evoked public discussion and academic research on just transition in food systems. The undisputable legitimacy of the idea of just transition makes it an attractive concept for all food system actors who might be affected by low-carbon transition policies in direct and indirect ways. Some of the claims that are being made are warranted claims for justice, some merely defend the achieved privileges and benefits. In addition, existing food injustices have evoked suggestions that just transition must be about making the food system overall just and sustainable. All these calls complexify low-carbon transition. How to make sense of these partly conflicting claims for justice and just transition in food systems?

Keywords: justice, climate mitigation, food system transformations, trade-offs

Introduction

The importance and urgency of climate change mitigation and adaptation reside at the heart of any approach to climate justice. Vulnerable communities, who have had very little to do with causing climate change, will face many of the climate change driven harms first or in the most severe forms. They are also often less capable of adapting to climate change because they benefitted so little from the economic growth that increased the wealth and adaptive resources of the high-emitting communities. Polluters gained a double benefit. Thus, mitigating climate change and supporting the less resourced communities in adaptation are high-priority tasks in justice agendas. Moreover, unless mitigation action is taken, climate change proceeds all the time aggravating climate injustices. The pressure for urgent and effective mitigation concerns food systems very much because the IPCC estimates food system activities to contribute 21-37% to human-caused emissions. It means that sufficient overall global emission reductions will require significant actions in food systems, especially in the industrialized countries.

The above characterization evokes ‘the first call’ for justice regarding climate change. Now, this call – due to its transformative impacts on societal activities in the high-emitting countries – has become increasingly equipped with ‘the secondary call’: the call for *just transition*, making the low-carbon transition processes just. Just transition claims originate from labour environmentalism but have widened to cover the socio-economic impacts of decarbonisation, first for energy transitions (e.g. Morena *et al.*, 2020), and more recently within food system transitions as well (Kaljonen *et al.*, 2021; Tribaldos and Kortetmäki, 2022). The concept of just transition has been adopted so quickly into the sustainability transition studies and political agendas that more theoretical and philosophical takes on the matter have remained in margin. This is unfortunate, since the concept is gaining momentum and attracting numerous competing interpretations. Promoting just transition is impossible if there is no clarified understanding of what it actually means and how to make sense of, and choose between, the competing demands. In the worst case, the messy battlefield for just transition may water down mitigation, rendering the low-carbon transition into non-transition.

Food issues pose some of the most demanding questions for conceptualizing just transition: unlike energy systems, where changing the production mode rarely influences end user experiences, food system transformations have much more complex and visible outcomes on our plates. Various ways of producing, preparing, serving, and eating food are linked not only to human needs and health but also to livelihoods, social and cultural traditions and other practices. What we eat, where and how and with whom, and what happens in supply chains before the food reaches our plates, influence humans and their well-being in numerous ways. What can food system oriented ethics, then, say about the relationship between the two calls for justice – one made for urgent and strong climate action also in food systems, another one urging that climate actions themselves must be just to all parties?

To address this question, I first map out concerns that have been raised in food system transitions literature and public discussions regarding just low-carbon transition processes in food systems. After that, I will construct an ethics-based set of arguments to propose what can and what cannot be the point of just transition, in relation to the call for effective climate mitigation and climate justice. Last, I reflect upon issues that will need further theoretical and/or empirical clarification, and conclude with a short sum-up.

Steaks at stake

Philosophical takes on justice and equality have shown that reasoning with the help of imaginary examples can be useful but also take reasoning to side-tracks where the point of equality is forgotten (Anderson, 1999). If justice theorizing is to have relevance in the world, it should advance seeing and addressing the existing forms of oppression and evaluating which actions make societies more or less just. Thus, instead of relying on imaginary thought experiments, I begin by roughly mapping the territory of the claims for just transition for ethicists to explore. This mapping is not exhaustive but rather demonstrates the diversity of stakes that have been raised as potentially relevant with relation to the justice aspects of food system transitions (Kaljonen *et al.*, 2021; Tribaldos and Kortetmäki, 2022).

Table 1. Concerns for just transition in food systems (a rough mapping of diverse issues).

A concern that transition may impact	Clarifying remarks
Injustices related to the vital aspects of food security	Related to food as a biological need for a healthy and active life
Injustices related to the non-vital aspects of food security	Cultural appropriateness of food, some non-vital nutritional issues
Disproportionate burdens imposed by dietary transition policies	Depends on the present diet and capacities to alter one's diet in satisfactory ways
Job / livelihood losses	E.g. discontinuation of farming because of inability to transform production to meet the new requirements
Disproportionate sharing of economic benefits and burdens from transition	E.g. whether climate action imposes costs that are unbearable for small entrepreneurs
Disproportionate sharing of environmental benefits and burdens from transition	Externalized environmental impacts without adequate compensation
Environmental / ecological quality harms	Degraded soil, water, or air quality; biodiversity
Injustice to animals	Quantifying instrumentalization; decreased welfare (livestock → poultry transition)
Procedural injustices in decision-making	Non-inclusive political processes
Socio-cultural disrespect / ignorance of particular groups or views (justice as misrecognition)	Socio-cultural domination of certain discourses and the devaluation of others

Section 1

It is easy to see that the idea of ‘just transition’ brings in numerous claims and (often competing) ideas about what just transition must cover to be just. This creates a need to clarify the aims and meaning of just transition. As a complex normative question that concerns resolving the real-world problems, this is a task of applied ethics.

What is the point of transition?

Answering to what just transition must accomplish or avoid, we must distinguish two questions: the point of the transition itself, and the point of making that transition just. The latter question also invites further considerations about the nature of justice in this specific context. I will now address these two questions.

- §1. For the purposes of conceptual cohesion with the established literature, I understand just transition as denoting justice in the context of low-carbon transition processes. (This does not mean that other environmental impacts would not be important.)
- §2. The need for low-carbon transition is grounded on existential concerns. If sufficient climate change mitigation fails, avoiding dangerous climate change is (according to the best available knowledge) very likely unavoidable. The only exception for the avoidability may be the utilization of large-scale solar radiation management, which poses other existential risks that cannot be fully managed or reversed if realized. Thus, it can be assumed that successful transition as effective and rapid reduction of GHG emissions is necessary for avoiding dangerous climate change.
- §3a. Non-transition, insufficient climate change mitigation, would threaten a range of human rights (e.g. right to life, water and sanitation, food, health, and self-determination) (OHCHR).
- §3b. Non-transition would also constitute significant food injustices by aggravating problems related to food availability and supply stability; food safety; utilization (nutritional values of heat-sensitive crops); and by unequalizing the access to food (due to the rising food prices) and food system related livelihood opportunities.
- §4. Thus, non-transition constitutes the greatest climate injustice and – likely – the most fundamental food injustices as well, when longer timescales are considered.
- §5. Because food system activities constitute a significant share of GHG emissions, failure in food system emission reductions could alone prevent avoiding non-transition in overall terms.
- §6. Thus, low-carbon transition in food systems is required to avoid the greatest climate injustice (overall non-transition). It is the task of empirical research to determine where the critical threshold between transition and non-transition is.

What cannot be the point of just transition?

The above said has implications on what cannot or should not be the point of just transition.

- §1. Because non-transition likely represents the greatest possible injustices, the point of ‘just transition’ cannot be any idea that involves watering down the likelihood of achieving transition as sufficient emission mitigation needed to avoid dangerous climate change. This also concerns the most fundamental food justice issues related to food security.
- §2. Thus, the urgency and importance of transition creates a hierarchy between the objectives, transition itself and making the transition processes just (or more just).
- §3. Consequently, those claims for justice in transition processes that may undermine achieving transition in the first place are unwarranted: they are calling for short-term alleviation of lesser injustices at the cost of worsening greater injustices.

Skipping the 'avoid' from avoid-mitigate-compensate hierarchies

Because non-transition constitutes the greatest injustice to the greatest number of humans and nonhumans in the long term by very likely leading to dangerous climate change, there is a hierarchy between the objectives: activities that aim to make the low-carbon transition in food systems just (or more just) cannot undermine achieving sufficient emission reductions in a sufficiently short time span.

This implies that just transition does not adhere to the 'mitigation hierarchy' (avoid-mitigate-compensate) that has become established with relation to GHG emissions and environmental harms. The reason is that adhering to such hierarchy could either delay action and/or direct attention in 'just', yet ineffective, mitigation measures, watering down the aim to achieve sufficient emission reductions in the first place. A simplified example would be the suggestion to rely only on food education, grassroots citizen initiatives, and food choice nudging to promote food system transitions. (This is not to say that such policies could not play a *part* in transition policy sets.) Such measures have been very modest in effectiveness so relying on them will cause greater food injustices in the long run. If they, unexpectedly, turned out suddenly much more efficient than before, a rapid consumption-driven low-carbon transition without public governance could also generate numerous other food injustices to farmers and other food system actors (Kortetmäki, 2019). Thus, the goal of just transition requires governing the transition. Because achieving sufficient mitigation is known to be very demanding in food systems anyway, considerations about justice in that process must not assume that avoiding all unjust impacts or inequalities would be possible while meeting mitigation demands. Acknowledging that harm cannot be fully avoided and agreeing about appropriate compensation for it might be the least unjust way to transform food systems.

Points that need clarification

The reasoning above suggests certain negative boundary conditions by stating what just transition cannot be about. What can be said, and on what basis, on those claims for justice in transition processes which do not undermine the prospects for achieving transition in the first place? I identify that answering this question will call for clarifying at least four points.

- §1. Type. Determination of what kinds of harms can constitute injustices in food system transition, as distinguished from other concerns that are not about justice but about food ethics and values more generally. This work has been carried out to a relatively comprehensive extent (Tribaldos and Kortetmäki, 2022).
- §2a. Threshold. Determination of the magnitude where certain type of harm becomes unjust. Thresholds for food system related harms, while partly hinted in the above mentioned set of just transition criteria, have not (to my knowledge) been addressed in detail anywhere.
- §2b. Counterfactual reference point. Determination of the point of comparison against which a transition-induced harm can be argued as unjust. For example, if 'business as usual' anyway decreases farms' profitability by 20% over the next decade, is the transition unjust if climate policies will decrease their profitability by 10%? One of the philosophically challenging questions is to determine when and how much these counterfactual reference points matter.
- §3a. Overall threshold. What and how much must a transition do to be just? This also relates to asking whether 'just transition' should be understood as denoting an ideal (unachievable) benchmark to assess whether actual transitions are more or less just, or whether just transition should denote a non-ideal conception of minimum justice that should be achieved.

Section 1

Types and thresholds

It is important to distinguish claims that qualify as warranted concerns of justice from those that defend other interests or achieved privileges upheld by the present, unsustainable and unjust food systems. A preliminary distinction has been proposed for food system transitions (Tribaldos and Kortetmäki, 2022). The central tenet is that since justice is about equality, claims for justice should be generalizable for all actors in a similar position. From this viewpoint, claims concerning human rights and the satisfaction of basic needs – including the vital aspects of food security – qualify as high-priority claims for justice (meaning that they win in the cases of conflicting claims). The ‘type of harm’ question is also relevant for the socio-cultural disputes (Kaljonen *et al.*, 2021), reflected in ‘bean vs beef’ debates that are frequent in just transition discussions. The idea of equality implies that practices that could be upheld only by privileged groups cannot be claimed to merit protection in the name of justice. The present Western levels of meat consumption exemplify such a practice: in any sufficient mitigation scenario, the dominant Western diets could be upheld only by a small privileged minority. There is no related right meriting protection in the name of just transition, and the cultural appropriateness aspect of food security will raise numerous questions that need ethical clarification in the context of sustainability transitions.

Many burdens (e.g. economic costs) become unjust only after a certain threshold. A common way to determine a justice-related threshold for evaluating such burdens focuses on whether burdens impact on the equal opportunity of individuals to achieve well-being, defined as the possibility to satisfy basic needs (Kortetmäki and Järvelä, 2021). This is akin to the minimum social justice approaches where justice is defined in terms of its minimum requirements. Climate justice literature has asked in this respect: Does the impact X cause any individuals or groups to fall below the threshold of harm? (Wallimann-Helmer *et al.*, 2018). This is a complex question in practice though. It is possible that climate food policies drop some individuals below the threshold of harm by making some foods unaffordable to low-income groups. However, such harm can be compensated by social support measures that bring the impacted individuals above the threshold. In that case, climate policies for food do not create new injustices in overall terms; the transition remains just due to supporting social policy.

The upshot: what is the point of just transition?

Some more general concluding remarks are at place. There is no just transition if there is no transition. The importance of securing effective and rapid emission reductions sets the limits to justice considerations in just transition: striving for just transition must not undermine transition itself. Thinking about food related matters amplifies this remark. Thus, the point of just transition is to find the way in which sufficient transition (GHG emission reductions to avoid dangerous climate change) can be made more just. One could say that the point is to realize the transition ‘as justly as possible’. Some argue, in this spirit, that the transition should be made an all-encompassing just transformation process that makes food systems overall just and sustainable. I acknowledge the importance of numerous non-climatic issues yet my conviction is that the time runs out for transition if all concerns are brought on the same table. Low-carbon transition is, in its urgency, a sort of ‘meta-goal’ for other justice claims: if dangerous climate change is not avoided, many other claims for justice will be meaningless in the future.

Transition aims at protecting the fundamental, vital human interests. It is unfair to demand anyone to sacrifice vital interests for the sake of others being able to avoid sacrificing their trivial interests (Shue, 2014). This sets the basic order for these matters. To determine what this means concretely is a matter of interdisciplinary work. Empirical scientists can identify actions that sufficiently reduce food system emissions. Social scientists help in understanding the societal feasibility of such options, given the material, economic and structural constraints and path dependencies that limit quickly realizable

actions. This information comprises the 'menu' of the different ways to reduce food system emissions and philosophers can help in evaluating which one of these ways is the most just.

References

- Anderson, E.S. (1999). What is the point of equality? *Ethics* 109(2): 287-337.
- Gough, I. (2017). *Heat, greed and human need: Climate change, capitalism and sustainable wellbeing*. Edward Elgar Publishing, Cheltenham, United Kingdom, 264 pp.
- Kaljonen, M., Kortetmäki, T., Tribaldos, T., Huttunen, S., Karttunen, K., Maluf, R.S., Niemi, J., Saarinen, M., Salminen, J., Vaalavuo, M. and Valsta, L. (2021). Justice in transitions: Widening considerations of justice in dietary transition. *Environmental Innovation and Societal Transitions* 40: 474-485.
- Kortetmäki, T. (2019). Tensions between food justice and climate change mitigation. In: Vinnari, E. and Vinnari, M. (ed.) *Sustainable governance and management of food systems: Ethical perspectives*. Wageningen Academic Publishers, The Netherlands, pp. 53-58.
- Kortetmäki, T. and Järvelä, M. (2021). Social vulnerability to climate policies: Building a matrix to assess policy impacts on well-being. *Environmental Science and Policy* 123: 220-228.
- Morena, E., Krause, D. and Stevis, D. (2020). *Just transitions: Social justice in the shift towards a low-carbon world*. Pluto Press, London, United Kingdom, 240 pp.
- Nussbaum, M.C. (2006). *Frontiers of justice: Disability, nationality, species membership*. Belknap Press, Cambridge, United States, 512 pp.
- Office of the High Commissioner for Human Rights (OHCHR). (2022). OHCHR and climate change. Available at: <https://www.ohchr.org/en/issues/humanrights/climatechange/pages/hrcclimatechangeindex.aspx>.
- Shue, H. (2014). *Climate justice: Vulnerability and protection*. Oxford University Press, Oxford, United Kingdom, 368 pp.
- Tribaldos, T. and Kortetmäki, T. (2022). Just transition principles and criteria for food systems and beyond. *Environmental Innovation and Societal Transitions* 43: 244-256.
- Wallimann-Helmer, I., Meyer, L., Mintz-Woo, K., Schinko, T. and Serdeczny, O. (2019). The ethical challenges in the context of climate loss and damage. In Mechler, R., Bouwer, L., Schinko, T., Surminski, S. and Linnerooth-Bayer, J. (eds.) *Loss and damage from climate change*. Springer, the United States, pp. 39-62.

7. Neoliberal conditionality to the European agricultural system: free trade agreements as a paradigm

A. Lasa López

Department of Public Law, Historical-Legal Sciences and Political Thought, Faculty of Social Sciences and Communication, University of the Basque Country, Barrio Sarriena s/n, 48940 Leioa, Bizkaia, Spain; ainhoa.lasa@ehu.es

Abstract

Although the Common Agricultural Policy (CAP) has been interpreted as a singular policy, alien to the conditioning factors of the integration project aimed at the construction and subsequent consolidation of the internal market, we do not share this sugar-coated vision. On the contrary, we believe that from its initial configuration it responded more to a political orientation based on prices and markets than to a logic of sustainable rural development with present and future environmental and social needs. These weaknesses of European agricultural social and environmental regulation are also present in the European Union's trade agreements with non-member third countries, which further underline the absence of their regulation as global common goods. In this respect, the European Commission's proposal for the revision of the EU's trade policy [COM (2021) 66 final] is illustrative of the functional dynamics of indirect social and environmental regulation, which is connected to the system of guarantees of the internal market, free competition and fundamental economic freedoms. We therefore believe that the fulfilment of social and environmental objectives will only be possible through a new sustainable trade policy that allows market intervention and control of production and price formation. The aim must be to minimise supply chains in order to focus on quality, in terms of environmental and social sustainability of the results. This, in turn, would require democratisation of the negotiation and decision-making processes on CAP and trade policy. To this end, the participation in these processes of genuine farmers and citizens as architects of a new Agriculture New Deal is a sine qua non condition that cannot be postponed any longer.

Keywords: competitiveness, social dumping, environmental dumping, democratisation, genuine farmer

Common agricultural policy at the European legal order: from food shortages and public intervention in the agricultural sectors to market-oriented sustainability

The Common Agricultural Policy (CAP) is not only one of the most important policies in quantitative terms – it represents 31% of the Union's total budget for the period 2021-2027 – but above all in qualitative terms – social and environmental. The significance of such a policy, due to its systemic nature (economic, social and environmental), was demonstrated by its early incorporation into the scope of the then European Communities.

Nevertheless, its initial configuration responded more to a political orientation based on prices and markets than to a logic of sustainable rural development with present and future environmental and social needs (Belo Moreira, 2015: 180-187). In fact, the aim was to increase the conditions of competitiveness and competition of large farms in the North, guaranteeing the intensification of intensive production models; and, in farms in the South, to promote the development of these models as opposed to small family farms. Therefore, it was not a question of designing agricultural policy according to the logic of public goods for the European Communities, but of shaping it according to the logic of competitiveness,

inserting agriculture into the dynamics of economic freedoms and competitiveness (Benevento, 2017: 2-4). Hence, social policy, which would include public policies on environmental sustainability, social inclusion, rural development and food security, was decoupled from structural policy (focused solely on reducing and harmonising costs in the context of liberalisation) and market and trade policy, occupying a secondary position in the various reforms.

Over time, this agricultural regulation began to have negative environmental and social effects. The policy of unlimited guaranteed prices designed to accelerate a market policy aimed at stabilising markets and orienting production, while ensuring a fair income for farmers, had the opposite effect, encouraging an agrarian capitalism that favoured (and favours) large, rationalised industrial farms and overproduction. Therefore, the reforms of the 1990s aimed at correcting the unequal distribution, replacing the market support system with direct income support for farmers and the incorporation of food quality and environmental obligations. With regard to the latter, Agenda 2000 [COM (1998) 182 final] led to the creation of a second pillar of the CAP on rural development, as a successor to the initial structural policy. Within this framework, the focus was also on strengthening competitiveness and moving towards a global approach to agricultural market liberalisation in order to meet the objectives set by the World Trade Organisation (WTO).

The 2013 CAP reform, which took place during the post-global financial crisis period, continued to further decouple aids from the growing quantities produced in order to correct the unequal distribution, limiting the budget to large farms, providing for additional aids for small farms, the development of environmental practices (greening payments) and the promotion of young farmers. However, this reform did not result in a recapitalisation of small farms that would allow investments in harmony with the promotion of competitiveness.

Finally, on 2 December 2021, the EU Council formally adopted the renewed CAP for the period 2023-2027. The foundations that inspire it once again reflect the rhetoric present since the reforms of the late 1990s: the guarantee of ecological sustainability based on results and social sustainability for European farmers and livestock farmers with more specific support for smaller farms. Moreover, the renewed CAP continues to be anchored within the market-oriented strategy, considering the context that motivated its change. Specifically: the loss of competitiveness of agricultural prices, weakened by macroeconomic factors (financial crisis), geopolitical tensions (China and the USA); the need for greater openness to world markets through bilateral trade agreements; and the difficulties generated for the economic health of the agricultural sector by climate change [(COM(2018) 392 final)].

Furthermore, although the CAP 2023-2027 brings together commitments to the European Green Pact (COM(2020) 381 final), the 2030 Agenda for Sustainable Development (2015) and the 2017 European Pillar of Social Rights (EPSR), these principles lack the necessary legal effectiveness to reverse the process of recommodification the EU's agricultural and livestock policies. Starting with the Agenda's transversal objectives projected in the Green Pact and the EPSR, sustainable development ascribed to economic, environmental and social dynamics declines accordance with the provisions of Article 3.3 of the Treaty on European Union. In particular, the 'integrated and indivisible character' of the three dimensions of sustainable development combines through the divisibility of social, economic and environmental with a clear prevalence of the second dimension (economic growth based on the guiding principle of price stability and enhanced competitiveness). In other words, they materialise in a functional indirect social regulation that connects them to the system of internal market guarantees, free competition and fundamental economic freedoms.

Continuing with the logic of the reform aimed at market discipline, the CAP 2023-2027 continues to opt for an aid system that runs counter to the objectives of the Green Pact. In fact, it is striking that at

Section 1

no point has the expulsion of large farms from the support system been considered as a measure aimed at green agriculture. Especially if we bear in mind that these farms (net beneficiaries of the distribution of funds) promote an industrial model far removed from social sustainability. Continuing with the EPSR and its connection with the renewed CAP, the social dimension, internalised for the first time through the linking of aid to adequate employment conditions for agricultural workers, will not be compulsory until 2025. Thus, conditionality attenuates by losing its status as a reinforcement of social sustainability. Moreover, this conditionality will not apply to all recipients of any of the aids under the first pillar of the CAP. These weaknesses in European agricultural social and environmental regulation are also present in the trade agreements, deepening the absence of their regulation as global common goods. In this respect, the European Commission's proposal for a review of the EU's trade policy [COM (2021) 66 final] is illustrative. In it, the Commission recalls the necessary protection of intellectual property (page 3). However, the Commission seems to forget that it is this unqualified guarantee of ownership that limits farmers' access to seeds. Curiously, this protection is also in conflict with some of the objectives of the Farm to Fork Programme [COM (2020) 381 final]. Basically because this programme talks about the need for farmers to have access to quality seed diversity for plant varieties adapted to the pressures of climate change in order to guarantee both the security and diversity of the seeds themselves (page 9). In any case, it is time to look in more detail at the relationship between the European agricultural system and free trade agreements.

The relationship between the CAP and free trade agreements: symbiosis or exclusion?

As we have already noted, the CAP integrated into the process of forming a common market starting with the original Treaties. Following this dynamic, its inclusion in the area of economic freedoms also placed it within the framework of the common commercial policy which, after the initial protectionist measures on agrifood markets (tariffs, internal subsidies), gave way to a gradual liberalisation of CAP regulation in line with the commitments entered into at the WTO (Potter and Tilzey, 2005). At the same time, the multifunctional objective of the CAP with the inclusion of a second pillar in the 1999 reform, rural development, meant that the dynamics of sustainable development, with the shortcomings noted above, also began to take effect in trade relations. In particular, trade and sustainable development provisions have been at the heart of EU trade agreements since 2010. Since that time, all EU agreements began to include a sustainable development chapter for the promotion of human rights, labour and environmental principles. However, the lukewarm provisions for dialogue and cooperation on the enforcement of these clauses have meant that their possible violations cannot be punished by suspending trade preferences (Hartmann and Fritz, 2018: 20-21).

The same conclusions reach with regard to the lack of operability of the chapters on trade and sustainable development, which include sanitary and phytosanitary provisions designed as trade restrictive measures to guarantee food safety and sustainability (Alabrese, 2017: 146-148). The rejection of the legal operability of the precautionary principle on environmental or labour issues by some of the third countries that are signatories to trade agreements with the EU puts European agricultural products at a disadvantage compared to third-country producers. The lack of reciprocity in the control of imports and exports generates a serious asymmetry that aggravates the situation of small farms unable to compete not only within the Union (due to the inequality of the CAP's first pillar payment redistribution policies that still persist), but also abroad. This means that small farms are victims of two-way social and environmental dumping (endogenous and exogenous to the European supranational space). A paradigm of this inequality is the lack of reciprocity for European exporters of fresh fruit and vegetables. Apart from the singularities of the sector itself (different sanitary and phytosanitary and production conditions in the different member states), the main obstacle lies in the fact that EU exporters must comply with the so-called export protocols, which regulate the conditions of access to third-country

markets that are negotiated individually by each member state. However, imports of the same products to the European market do not require individual negotiation by each exporting third country, as similar specific protocols are not required. The solution to this issue should be linked to the inclusion of legally binding restrictive reciprocity clauses in trade treaties, i.e. emphasising the simultaneous exchange of strictly equivalent benefits and obligations (Yanai, 2001:3). In this respect, it can be objected that this type of reciprocity is disadvantageous for third countries whose competitive advantage is based on low environmental and labour costs to counterbalance their low industrial and digital development.

Nonetheless, it is also possible to counter-argue that, after several decades of continuous trade agreements with third countries that, despite their commitment to human rights and democratic principles, fail to break with their authoritarian configuration, the EU should demand greater guarantees of sustainable trade compliance. This seems to be the strategy of the aforementioned proposal for the reform of EU trade policy. If we look at the first of the objectives ('Supporting the recovery and profound transformation of the European economy in line with its green and ecological objectives'), in order to achieve it, the Union establishes the following priorities: supporting the ecological transition and promoting responsible and sustainable value chains. In turn, and as measures to fulfil the mentioned priorities: establishing an improved multilateral framework, promoting trade that supports decent work and social justice, or ensuring that imports comply with EU regulatory standards (pages 12, 13, 16). However, the orientation of EU countries' food systems towards an improved or modernised export-import model will not strengthen the role of farmers in value chains. Such an orientation will not achieve sustainable development with the green objectives of the Green Pact that generates responsible business practices and respects environmental, labour and human rights standards. Finally, it will not create the conditions and opportunities for sustainable products and services. Basically because for these objectives to be met, a new sustainable trade policy needs to be developed, intervening in markets and controlling production and price formation, reducing supply chains and focusing on quality of output.

This transformation, in turn, would require democratisation of the negotiation and decision-making processes on the CAP and trade policy. In other words, plural and direct deliberative participation in such procedures beyond the consultative processes for producer organisations. Deliberation, understood as the efficient and effective quality of people's influence on policy processes, links deliberation to its effectiveness as a mechanism of political control and its enabling efficiency of ownership of the policies to which they are subject. To this aim, the transformative potential of the Conference on the Future of Europe could be harnessed for the testing of a participatory and deliberative increase in the review of trade policy. So, within the framework of the Conference will be carried out both functional tasks (source of ideas that contribute to incorporating into the trade agenda elements of the debate that remain excluded from the decision-making processes of the Union's institutions) and decision-making tasks, in the strict sense of the word, in the elaboration and development of a renewed trade policy. developing both functional tasks (source of ideas that contribute to incorporate into the trade agenda elements of the debate that remain excluded in the decision-making processes of the Union's institutions) and decision-making tasks, in the strict sense of the word, in the elaboration and development of a renewed trade policy.

To this end, the inclusion of small farmers and EU citizens in the deliberative frameworks is a prerequisite for reversing the process of recommodification of agricultural and trade policies. With regard to the former, participation should be limited to 100% genuine farmers, meaning those whose agricultural income represents, at least, 51% of their total income (a significantly higher percentage than the current 20%). This discrimination can be interpreted as a positive action measure, given the historical underrepresentation of the group of 100% genuine farmers in the processes of participation in agricultural policies. This measure, far from furthering diversity of viewpoint, would address the problems common to small farms in the Union, managed by farmers whose income depends almost entirely on the farm.

Section 1

The main problem is the endemic speculation in the prices of agricultural and livestock products. In this respect, remember that large farms, the net beneficiaries of the distribution of funds (European Parliament, 2021), play a hegemonic role in price formation. This hegemony feeds speculation and runs counter to the very logic of free competition on the EU's agricultural markets.

At the same time, and in order to encourage this deliberative participation, farmers who take part in these deliberative processes should be paid a sum, so that absolute dependence on their agricultural income would not be an obstacle to participation. Regarding citizenship, deliberative participation would be the result of a lottery based on the following criteria: gender, age, geographical location, educational level and socio-economic status. So that the sample of citizen participation resulting from the draw would be as diverse and pluralistic as possible. Union citizens would have the opportunity to deliberate with those directly affected by speculative and extractive practices, following the strategy, in a play on words, 'from genuine agriculture to Union citizenship'. The aim would be to 'democratise' the trade and agricultural lobby, introducing different logics to those hitherto dominant in the deliberative processes.

This last approach also makes it possible to include citizens and farmers in the context of the CAP and trade policy, not as economic actors (consumers and producers), but as socially and environmentally committed citizens. The characterisation of citizens and farmers as consumers and producers (purely economic actors) contains the trap of removing from the CAP-Trade Policy relationship the conflict between clearly conflicting objectives. On the one hand, a fair, sustainable and inclusive agricultural policy. On the other hand, a trade policy anchored in the logic of cost-benefit calculations. Consumers would act as mere suppliers of supply and demand, and exporters and importers (not genuine farmers) would act as mere organisers of import and export processes, without conditioning redistribution systems, price formation and food sources. A fable from which we can only escape by breaking the apparent uniformity of interests and placing citizens and farmers in a position of mutual interaction, developing relations of proximity to bring the effective exercise of the right to food and food production closer to their legitimate holders.

References

- Alabrese, M. (2017). Gli accordi commerciali 'mega-regionali' e l'elaborazione del diritto agro-alimentare. *Rivista di Diritto Agrario* 1: 136-152.
- Belo Moreira, M. (2015). Chapter 9: The European Common Agricultural Policy: a tale of slow adjustment to neoliberal globalization. In: Bonnano, A. and Busch, L. (eds.). *Handbook of the International Policy Economy of Agriculture and Food*. Edward Elgard. United Kingdom, pp. 173-190.
- Benevento, M. (2017). The European Common Agricultural Policy: moving forward. *Undergraduate Journal of Global Citizenship* 2(2): 1-39.
- European Parliament (2021). *The Largest 50 Beneficiaries in each EU Member State of CAP and Cohesion Funds*, 258 pp. Available at: https://www.europarl.europa.eu/meetdocs/2014_2019/plmrep/COMMITTEES/CONT/DV/2021/01-25/Study_Largest50Beneficiaries_EN.pdf.
- Hartmann, A. and Fritz, Th. (2018). *Trade at any cost? Foodwatch*, Berlin, 64pp.
- Potter, C. and Tilzey, M. (2005). Agricultural policy discourses in the European post-fordist transition: neoliberalism, neomercantilism and multifunctionality. *Progress in Human Geography*, Vol. 29, no. 5: 581-600.
- Yanai, A. (2001). Reciprocity in trade liberalization, Working Paper Series 00/01, no. 2, 25pp.

8. Feminist political ecology of agricultural changes in Myanmar

N. Lopez

*The University of Edinburgh, 27 George Square, Edinburgh EH8 9LD, United Kingdom;
nuria.lopezvazquez@ed.ac.uk*

Abstract

In a time of anthropogenic climate change, agriculture has become a major focus for deconstruction among feminist scholars. New questions are being posed about how global agriculture might be practised otherwise, while growing sufficient food in a manner that replenishes the soil, the planet and its climate. Feminist political ecologists draw the attention to gendered and racialized processes within the politics of environmental degradation and the neo-liberalization of agriculture. To ensure there is a new conversation about how to create sustainable livelihoods society-environment relations must not disentangle gender from ethnicity, class and other social categories. Shifts in the global agrosystem have affected indigenous women in agriculture in multiple ways. This work explores the various understandings of care and work through the case study of indigenous women's home gardens in the Shan mountains of Myanmar. As farmers are required to do more work due to the intensification and productivism of monoculture farm fields, tending both farm fields and home gardens is becoming challenging for indigenous women. Women's involvement in industrial farming is changing their norms of use, transferring practices from farming to homes. On the one hand, this analysis highlights the importance of thinking through the tensions between work and care in the household practice of home gardens to envisage diverse ways of farming and regenerative agriculture. On the other hand, it stresses the necessity to care for humans and the more-than-human world in the ecological economics of agriculture. This work concludes that the marginalization and invisibility of care labour among indigenous women is rendering alternative food projects such as home gardens less important and capable of transformative change towards a more regenerative agriculture.

Keywords: feminist political ecology, Myanmar, agricultural changes, home gardens, ethnic minority, ethics of care, farming communities

Introduction

Agricultural modernization and productivism have pushed many countries in the global South into the mono cultivation of non-traditional export crops and the intensive use of chemical inputs. Agricultural development has disentangled the labour of care in agriculture, labelling it as feminine and traditional undermining women's labour and position in agriculture. In Myanmar, while ethnic minority farmers are left with little choice but to move away from sustainable farming methods, new farmers, mostly of Bamar ethnicity are slowly emerging as actors in sustainable farming practices. For the past 3 years, the department of agriculture has been promoting organic farming training in ethnic minority areas, however very few farmers in ethnic villages have converted to organic farming. Sustainable agricultural development practitioners and policy makers such as the department of agriculture ignore ethnic minority women's work in home gardens as a valid source of regenerative and organic agriculture as it is merely perceived as feminized care labour and provide training on organic farming to these women. When local knowledges, subsistence and community-oriented farming practices and reproductive soil care practices continue to be rejected and even emerging sustainable agricultural development practices narrowly focus on environmental benefits paying no attention to social justice, listening and learning from ethnic minority women is vital to ensure a just transition in the country. This paper explores the various understandings of care and work through the case study of ethnic minority women's farming

Section 1

practices in the mountains of Southern Shan state of Myanmar. On the one hand, this analysis highlights the importance of thinking through the tensions between work and care in the household practice of home gardens versus farm fields to envisage diverse ways of farming and regenerative agriculture (Murphy and Parry, 2021). On the other hand, it stresses the necessity to care for humans and the more-than-human world in the ecological economics of agriculture (Bellacasa, 2017). I draw on Feminist political ecology (FPE) to shed light to the gendered and racialized processes within the politics of environmental degradation and the neo-liberalization of agriculture in Myanmar (Moragues-Faus and Marsden, 2017; Sachs and Alston, 2010). The paper concludes that ethnic minority women's work in home gardens is not considered a valid source of regenerative agriculture as it is merely perceived as feminized care labour. Between 2017 and 2020 I visited villages nearby Kalaw in Southern Shan state and lived with several farming families. During this time I was able to learn about the everyday life of ethnic minority farmers in these villages and was drawn to the changes that were shaping their lives throughout this period. This is a compilation of interviews, everyday observations, daily acquaintances and embodied experiences on and around farms, home gardens, food markets, monasteries, guesthouses and caves. The data for this project was collected while international development aid was flooding into the country. A time in history where the country created its first sustainable development plan and when the word democracy was in everyone's mouth. A time when the military dictatorship seemed a thing of the past, yet its armed forces continued to be entrenched in the country's everyday life and politics.

Literature review and methods

In the rapidly changing environment of Southern Shan state where agricultural development is quickly transforming the social, environmental and economic structures, a critical lens is needed to understand the current changes. Myanmar's agricultural policies and narratives have been based on the binary of modern versus traditional agriculture, developed versus underdeveloped, rejecting any different development path beyond industrial and modernized agriculture. These binaries have been critiqued by feminist political ecologists (FPE) because they cannot adequately explain or help us understand the dynamics of environmental destruction, degradation and change in specific places, regions and across history and scale (Jarosz, 2017). FPE of agriculture recognize the food system itself as a racial project that problematizes the influences of race, gender and class on the production, distribution and consumption of food (Alkon and Agyeman, 2011). FPE approaches are quickly emerging among South-East Asian agricultural development scholars to shed light on the complex and situated contexts in the region (Bryant, 2015; Park and White, 2017). FPE approaches are particularly relevant in Myanmar where 135 ethnic minority groups exist representing the majority of the farming population in the country (Faxon, 2017). Power comes into play in different ways such as framing narratives, achieving legitimacy and visibility, setting debate terms and influencing policy. In one of the major towns in Southern Shan State, Kalaw new farmers are emerging among Bamar people that leaving previous jobs in cities. New farmers have seen an opportunity to invest in organic farming, positioning themselves as the sustainable food alternative to the food produced in ethnic minority farming areas mostly using chemical inputs. Bamar are most numerous in Myanmar, constituting the majority ethnic group and 60% of the population (Ministry of Labour, immigration and population Myanmar 2020). Emerging organic farming has led to the creation of 'protected' spaces for a niche audience within the industrialised food regime in Myanmar and with little impact or change on the food injustices and lack of sovereignty suffered by ethnic minority farmers. For instance, new farmer's markets selling organic food are inaccessible for ethnic minority women. Here access is not only understood by cost but also by cultural distance. The crops being sold in those markets are not commonly consumed by ethnic minority communities and neither do the new structures that govern these new farmer's markets allow access to them. The access and sovereignty to culturally appropriate food, free of chemicals and hazards and the ability to take care of their environment is slowly only being granted to a few under the political ecology of agricultural development in Myanmar.

Documenting the FPE of agricultural changes in ethnic minority farming villages in Myanmar can shed light on the realities of the majority of the farmers in the country and the complexities behind sustainability transitions in agriculture. Such analysis can make visible what is invisible in the economy and agricultural communities and households in rural Myanmar, including the vital relations between work and care labour and the gendered divisions of both forms of labour. The increasing degradation of soils and water resources as well as intensification and mono cultivation taking place in farm fields in ethnic minority villages demonstrate how the labour of care has been diminished in agricultural practices. The interaction between farm fields and home gardens allows for an analysis of work and care labour dynamics in ethnic minority farming villages and ultimately a different perspective on the sustainable pathways that are available for the country. To understand care in the context of agriculture, we need to understand the origins of care in research literature. Wells and Gradwell define caring as that ‘includes everything that we do to maintain, continue, and repair our ‘world’ so that we can live in it as well as possible.’ She includes in this world ‘our bodies, ourselves, and our environment, all of which we seek to interweave in a complex, life-sustaining web’ (Wells and Gradwell, 2001). Care theory is a growing school of ethics intersecting with many disciplines and born out of feminist theoretical thought. The ethic of care has its roots in social psychology and has now influenced many other disciplines in the social sciences as well as the humanities. There is been a major trend in which care ethics has moved beyond an understanding of welfare-related only to government services to one which incorporates all relations and daily life concrete situations and practices that contribute to the well-being, health, safety and security of individuals and communities (Jarosz, 2011). Care Theory and ethics focuses on relations among people as well as the influence structures and systems on those relations. However increasingly more attention is also been paid to the more than human world and humans’ relations with nature. A relational and caring model for agriculture requires rejecting the idea of food as a commodity and reconceiving food as a relational concept. An agriculture based on attentiveness to the local ecology as a model – but also what Care Theorists recognize – the relational nature of humans (Gilson, 2015).

Soil care, home gardens and monocultures

In traditional farming societies, agricultural labour is gender-disaggregated and home gardens are largely considered as a female gender domain, presumably, because, more often than not, they are part of the household unit. Home gardens are often classified as reproductive domestic spaces but in reality, research has shown that they are tremendously productive, albeit largely invisible realm. Home gardens contribute to the majority of the subsistence food of farming families they require a holistic level of technical and environmental knowledge. This knowledge is passed over generations and requires a third of a lifetime to accrue, as well as frequent adaptations (Sachs *et al.*, 2020). In the Shan Mountains of Myanmar home gardening practices represent women’s fight to produce meaningful amounts of safe, nutritious, and culturally acceptable food that they would otherwise not be able to afford in the markets. Home gardens are perceived as traditional and female as they depict how farming used to be practised in the region by both men and women before modernization and productivism shaped the meaning of care in agriculture. Home gardens are networks of community solidarity among women providing multiple forms of ecosystem services. These services include, for instance, seed saving and food sharing practices that contribute to regenerative soil practices of multi-cropping, while using very limited chemicals. Currently, women increasingly struggle to maintain their life-sustaining practices of home gardens because of agricultural modernization and productivism. A few studies have investigated the role of home gardens in influencing household food insecurity and dietary diversity in Myanmar (Pritchard *et al.*, 2019; Rammohan *et al.*, 2019). This research indicates that the presence of a home garden is positively associated with nutrition in rural households of Myanmar.

The current literature on home gardens in Myanmar is however relatively silent on the factors and context that shape these practices, their uptake and changes. As farmers are required to do more work

Section 1

due to the intensification and productivism of monoculture farm fields, tending both farm fields and home gardens is becoming challenging for ethnic minority women. Thus, women are now involved in paid farm labouring and unpaid home-based work. As a result, ethnic minority women have taken on many adaptation strategies to maintain their livelihoods and communities and continue tending to home gardens. The increased use of agrochemicals and large volumes to sell from farm fields are having direct impact on home garden practices that are now increasingly being dumped with leftover chemicals from farm fields. Women's involvement in industrial farming is changing their norms of use, transferring practices from farming to homes. Some of these adaptations such as the use of chemicals and foreign seeds jeopardize women's willingness and labour of soil and community care. As a result of agricultural developments and modernization ethnic minority farmers, are increasingly exposed to environmental injustices. The disproportionate exposure of ethnic minorities to chemicals and higher pollution is having detrimental effects on their health and environment and ultimately, their ability to take care of themselves. The marginalization and invisibility of care labour among ethnic minority women are rendering alternative food projects such as home gardens less important and capable of transformative change towards a more regenerative agriculture (N. Lopez, fieldwork 2020).

Agricultural development through modernization and productivism have rejected the labour of care contributing to labelling it as feminine and traditional, as we see in home gardens. Care has as a result been disassociated from modern agriculture and work is now driven by purely productionist tasks that produce at the expense of other relations and follow linear temporalities. Within the productionist model, the drive of soil care is mostly for the crops, where worn-out soils must be put back to work through soil engineering technologies such as litters of fertilizers and pesticides with little consideration for wider ecological effect (Bellacasa, 2017). This has not only put more pressure on men but also women who have to deploy more time in farm fields and as a consequence change their home garden practices. Women find it increasingly challenging to produce market crops and subsistence food without costly external inputs outside the rainy season. The reasons are multiple. Some of these include: (1) the purchasing conditions set by traders for crops that can only be attained using Chinese seeds; (2) the lack of access to organic farming and their markets; (3) the increased number of pests and the depletion of the soil. This is also true for their home gardens, where there is a generational shift from producing without external inputs using local manure and seeds to using the chemical inputs that they have left from their farm fields. The limitation of growing food only during the rainy season has led to debt, with many women getting trapped in a loop of debt year after year, with no way out. Farmers are left without a choice but to increase the number of chemical inputs to use in their farms due to lack of markets for organic food and the belief that it is impossible to be a 'farmer' growing food without chemicals. Farmers understand that to sustain themselves as farmers they need to sell to traders who have purchase control for most of the crops and as a result, fulfil their requirements in terms of quality (crops that can only be obtained using GMO seeds) as well as produce in large amounts and very quick, which can only be attained using GMO seeds, chemical pesticides and a large amount of water and mechanization. Furthermore, the uncertainty and stress that comes with taking risks and changing to a new market, where there are strict rules and regulations, make it very hard for farmers to produce using regenerative methods (N. Lopez, fieldwork 2020). As women's work in farm fields becomes more demanding and intensive, home gardens and caring tasks are more and more perceived as secondary, receiving less and less attention. Agricultural productionism has reduced what counts as care to a managerial conduct of tasks to follow, disregarding constructed interdependent relations and networks of co-dependency that can be seen in home gardens. Agrochemical inputs may in the short-term benefit crop yield, but soil communities can face long-term destruction, making soils and farmers highly dependent on chemical inputs. This simplistic view of soils and approach to care threatens to destroy the living agents and organisms that allow for this very productivity. Diminishing the work of care in agriculture through modernization and productivism contributes to building disengaged versions of reality (Bellacasa, 2017).

Conclusions

Today, ethnic minority women do most of the care labour in agriculture and this is clearly seen in the household practices of home gardens. This approach makes the longstanding gendered labour division in traditional farming communities embedded in socio-ecological relations and rural environmental transformations. Home gardens, can't be understood outside of the wider context of agricultural development. Looking into farm fields and home gardens as interlinked I have seen that one of the major changes brought by agricultural development in Myanmar is the lack of caring practices such as the regeneration and restoration of land and rural communities. As women's labour is co-opted according to the requirements of modernised agriculture rather than their own needs or wishes, the labour of care vanishes through the marginalization of regenerative practices. While women also work in farm fields, their methods of farming differ greatly from home gardens to farm fields. As women deploy more time in the farm fields for market sale, they have adapted their home garden practices shaping the food they feed their families with. As they are more in contact and get more familiarised with chemicals and external inputs in the farm fields, they lose their ability to produce organic food using local agroecological methods. As a result, gendered employment practices in agriculture constrain and construct ethnic minority women's decisions and work and caring practices in the home gardens. While home gardens are currently managed by women, the activities and practices employed in those are an indicative reflection of how agriculture used to be practised in the past by women and men. Home gardens, therefore, represent how everyone in the community men and women all grow food, not just how women do it. This remaking of care and work in agricultural norms involves inviting others to build social and environmental relations. As we see in home gardens, soil care and community care through good food are life-sustaining practices of agricultural communities in Myanmar. Conceiving household tasks in home gardens as purely reproductive leaves intact capitalist notions that worthwhile human activity only takes place in the paid economy. Understanding home gardens as spaces where people and more-than-human others come together into relationships of care allows for a re-reading of household activities and opens spaces for new forms of interventions connecting what appear to be individual actions with affective relations and interdependence of communities of humans and the more than human kin.

References

- Alkon, A.H., Agyeman, J., 2011. *Cultivating Food Justice: Race, Class, and Sustainability*. MIT Press.
- Bellacasa, M.P. de la, 2017. *Matters of Care: Speculative Ethics in More Than Human Worlds*. University of Minnesota Press.
- Bryant, R.L., 2015. *The International Handbook of Political Ecology*. Edward Elgar Publishing.
- Faxon, H.O., 2017. In the law & on the land: finding the female farmer in Myanmar's National Land Use Policy. *J. Peasant Stud.* 44, 1197-1214. <https://doi.org/10.1080/03066150.2017.1324424>
- Gilson, E.C., 2015. Vulnerability, Relationality, and Dependency: Feminist Conceptual Resources for Food Justice. *IJFAB Int. J. Fem. Approaches Bioeth.* <https://doi.org/10.3138/ijfab.8.2.10>
- Jarosz, L., 2017. Binary narratives of capitalism and climate change, in: *Other Geographies*. John Wiley & Sons, Ltd, pp. 55-62. <https://doi.org/10.1002/9781119184324.ch3>
- Jarosz, L., 2011. Nourishing women: toward a feminist political ecology of community supported agriculture in the United States. *Gen. Place Cult.* 18, 307-326. <https://doi.org/10.1080/0966369X.2011.565871>
- Moragues-Faus, A., Marsden, T., 2017. The political ecology of food: carving 'spaces of possibility' in a new research agenda. *J. Rural Stud.* 55, 275-288. <https://doi.org/10.1016/j.jrurstud.2017.08.016>
- Murphy, J., Parry, S., 2021. Gender, households and sustainability: disentangling and re-entangling with the help of 'work' and 'care.' *Environ. Plan. E Nat. Space.* <https://doi.org/10.1177/2514848620948432>
- Park, C.M.Y., White, B., 2017. Gender and generation in Southeast Asian agro-commodity booms. *J. Peasant Stud.* 44, 1103-1110. <https://doi.org/10.1080/03066150.2017.1393802>

Section 1

- Pritchard, B., Vicol, M., Rammohan, A., Welch, E., 2019. Studying home gardens as if people mattered: Why don't food-insecure households in rural Myanmar cultivate home gardens? *J. Peasant Stud.* 46, 1047-1067. <https://doi.org/10.1080/03066150.2018.1431623>
- Rammohan, A., Pritchard, B., Dibley, M., 2019. Home gardens as a predictor of enhanced dietary diversity and food security in rural Myanmar. *BMC Public Health* 19, 1145. <https://doi.org/10.1186/s12889-019-7440-7>
- Sachs, C., Alston, M., 2010. Global shifts, sedimentations, and imaginaries: an introduction to the special issue on women and agriculture. *Signs J. Women Cult. Soc.* 35, 277-287. <https://doi.org/10.1086/605618>
- Sachs, C.E., Jensen, L., Castellanos, P., Sexsmith, K., 2020. *Routledge handbook of gender and agriculture*. Routledge, London. <https://doi.org/10.4324/9780429199752>
- Wells, B.L., Gradwell, S., 2001. Gender and resource management: community supported agriculture as caring-practice. *Agric. Hum. Values* 18, 107-119. <https://doi.org/10.1023/A:1007686617087>

9. Changing beekeeping seasons in Vestland, Norway

S.P. Meisch^{1,2*}, M. Hempel^{3,4}, S. Bremer^{1,3} and E. Dunn-Sigouin^{3,4}

¹Centre for the Study of the Sciences and the Humanities, University of Bergen, Parkveien 9, 5020 Bergen, Norway; ²International Centre for Ethics in the Sciences and Humanities, University of Tübingen, Wilhelmstr. 19, 72074 Tübingen, Germany; ³Climate Futures, NORCE Climate, Jahnebakken 5, 5007 Bergen, Norway; ⁴Bjerknes Centre for Climate Research, Jahnebakken 5, 5007 Bergen, Norway; simon.meisch@uib.no

Abstract

Currently, apiculture is a niche topic in agricultural and food ethics. Yet, ethical issues arise for both beekeeping as a practice and for food production, which relies heavily on pollination services. Weather and climate impact apiculture directly by affecting honeybees and indirectly through their environment, vegetation, and pests. Against this backdrop, how can beekeepers' knowledge be mobilised to transform their seasonal knowledge and practices in the face of risks related to weather and climate? This is the main research question of the *BEEWARE* project, a one-year pilot research collaboration (2022) of scholars coming from the University of Bergen and the Norwegian Research Centre (NORCE). It studies, first, how beekeepers in the Norwegian Vestland region organise their activities over the year according to frameworks of 'normal' seasons, and how these are impacted by weather and climate. Second, it investigates how knowledge of current and future climate can mitigate risk important for beekeeping seasonal frameworks. And third, it co-produces informed practices together with beekeepers to support them in anticipating and adapting to weather and climate related risks. *BEEWARE* aims to initiate reflection on good beekeeping practices in times of climate change, and co-produce socially robust knowledge for food security.

Keywords: social practices, co-production, bee ethics, climate adaptation, time ecology

Introduction

In this paper, we will address the challenges of weather and climate related risks to beekeeping as a practice. So far, beekeeping, or apiculture, has been the focus of much academic and media attention because of mounting challenges including honeybee losses due to neonicotinoids (cf. Drivdal and van der Sluijs, 2021), the contamination of honey by GM plants (cf. Karafyllis and Friedmann, 2017) or the (potential) detrimental effects of (hobby) beekeeping on wild bees (cf. Geldmann and González-Varo, 2018; Steffan-Dewenter and Tschardt, 2000; Fenske, 2020). Especially, debates on bee losses due to the application of neonicotinoids and other such substances raised public awareness to the relevance of beekeeping for the global agricultural and food sector. Pollination by insects such as the honeybee is a crucial 'ecosystem service and a production practice used extensively by farmers all over the world for crop production' (Gallai *et al.*, 2009, 810; cf. also Karafyllis and Friedmann, 2017). In 2009, an ecological economics study calculated a 'world value for the contribution of pollinators to the production of crops used directly for human food of €153 billion, which is about 9.5% of the total value of the production of human food worldwide' (Gallai *et al.*, 2009, 819), and '87 crops, that is 70% of the 124 main crops used directly for human consumption in the world, are dependent on pollinators.' (*ibid.*, 810) Agriculture in tropical zones seem to depend even more on pollination than for instance in Europe (cf. *ibid.*, 820).

Weather and climate strongly influence beekeeping practices. For example, changes in weather and climate impact honeybees directly by modifying foraging and breeding patterns, but also indirectly through changes in their environment such as the timing of plant blooms. Beekeepers must regularly adapt their practices to these changing conditions, particularly in the Vestland region of Norway, which

Section 1

experiences large changes in conditions from day to day and season to season. Climate change is expected to lead to an increasing frequency of extreme weather events (e.g. droughts, heavy rains, storms), which pose a physical threat to the diversity of bees and influence the nectar supply in plants. These changes are already occurring in the Vestland region, which has experienced a 15% increase in rain over the last 30 years. A warming climate also results in shorter and milder winters, leading to an extended beekeeping season (cf. Bremer *et al.*, 2020). This increases the length of the honeybee brood rearing period, resulting in higher levels of varroa destructor infestation, a parasitic mite generally understood to be among the largest threats to beekeeping worldwide. This, in turn, will force beekeepers to change the way they treat pests (cf. Knight *et al.*, 2018).

Beekeepers themselves are realising that the weather and seasons are changing. For instance, in 2021, the Vestland County launched their climate magazine with a headline story on the negative impacts of global warming on local beekeepers (cf. Alvsaker *et al.*, 2021). The story highlights how traditional beekeeping practices are vulnerable to climate change, but also draws attention to the climate risk faced by agriculture: In Norway, pollination services provided by beekeepers are important in the Hardanger region producing 40% of all Norwegian fruit. The story opens with the headline: ‘No må vi handle raskt!’ (‘We must act now!’), underlining the urgency of these weather and climate risks for beekeepers in Vestland.

Recent developments in numerical forecasting offer a potential strategy for mitigating weather and climate risk. *Forecasts* on timescales longer than a typical weather forecast, ranging from one week to three-months ahead, are increasingly becoming available and dependable. Indeed, these forecasts have already started being used in agriculture, a closely connected industry (Ceglar and Toreti, 2021). These extended range forecasts could help beekeepers make decisions that require prior knowledge of change conditions weeks in advance, e.g. when to start feeding the bees in spring, when to start queen production, when and where to move their hives to harvest the next plant bloom. Thus, integration of extended range forecasts in beekeeping practices could potentially help buffer weather and climate risk.

Yet, despite clear evidence of weather and climate risk, and the accessibility of tools to mitigate it, there exists surprisingly little published research on how this risk impacts beekeeping, what practices are deployed to mitigate it, or how climate services could support these practices (cf. Vercelli *et al.*, 2021). In this paper, we present our *BEEWARE* project (2022), an explorative study, that collaborates with beekeepers in the Norwegian Vestland region to co-create knowledge and practices for good climate adaptation, especially relative to shifting seasonal rhythms. In its research, we deal with the question how beekeepers’ knowledge can be mobilised to transform their seasonal knowledge and practices in the face of risks related to weather and climate. Doing so, the project touches on, and deals with, a variety of ethical concerns, such as co-production, notions of good beekeeping practice, deliberations on good climate change adaptations, or more-than-human agency. Below, we first describe how *BEEWARE* explores the challenges beekeepers are facing in the Vestland region. Second, we discuss the emerging epistemological and ethical issues. Finally, we present some first insights.

The *BEEWARE* project

The *BEEWARE* project conducts a novel cross-cutting pilot study exploring the climate risk adaptation strategies of beekeepers in Vestland, Norway. The idea emerged from discussions at the boundary of three on-going research projects⁴ associated with the *Climate Futures* centre (NORCE) and the *Centre for the*

⁴ CALENDARS – Co-production of Seasonal Representations for Adaptive Institutions (<https://www.uib.no/en/calendars-project>); CANALS – Changing Water Cultures (<https://www.uib.no/en/svt/146488/changing-water-cultures-canal>); Climate Futures – Centre for research-based innovation developing climate prediction for handling climate risk (<https://www.climatefutures.no/en/home-en/>)

Study of the Sciences and the Humanities at the University of Bergen. Partnering with regional beekeepers and integrating their knowledge marks *BEEWARE* as a genuinely transdisciplinary investigation.

The project's overarching aim is to study how beekeepers' knowledge can be mobilised to transform their seasonal knowledge and practices in the face of risks related to weather and climate. The project has three phases (cf. Table 1).

A central organising framework for the project is the seasonal calendar of rhythms that structure, organise and synchronise beekeepers' practices in Vestland over the year. In Phase 1, this means mapping the climatic but also apian, phenological, organisational, social, and other conditions and cycles that are linked to bundles of beekeeping practices over the year, e.g. readying the bees for the season in March, or moving them to different sites in April. This is about describing the seasonal organisation and norms of beekeeping practices and how they are formalised in a repertoire of calendars, natural cues, information sources, beekeeper-bee interactions, styles of beekeeping and so on (cf. e.g. Shove *et al.*, 2009). In Phase 3, the project changes tack, and asks beekeepers to critically reflect on their organisation and norms, relative to experienced and anticipated changes to seasonality from climate change, but also other influences such as parasites, technological shifts, organisational innovation, or bureaucratic regulation (cf. Bremer *et al.*, 2021). This means asking beekeepers to imagine together – or co-create – new bundles of practices that could be better suited to shifts in seasonal rhythms and conditions (cf. e.g. work on critical horology Bastian, 2012; Pschetz and Bastian, 2017).

Epistemological and ethical perspectives

In *BEEWARE*, we study how weather and climate risks influence beekeeping and which ethical issues emerge. Our reasoning departs from previous research on climate co-production (cf. Bremer and Meisch, 2017) by first regarding beekeeping as a set of practices that is co-produced by humans, bees, plants etc., and second by acknowledging that practices such as beekeeping possess their *Eigenzeiten*, i.e. 'system-specific times and seasonal rhythmicity' (Adam, 1998, 3), leading to the co-production of beekeeping seasons. With the first perspective, we are referring to normative approaches in multispecies studies (cf. Phillip, 2014; 2020; Fenske, 2020) and insect ethics (cf. van Loon and Bovenkerk, 2021; Gjerris *et al.*, 2016) and, with the second, to time ecology (cf. Adam *et al.*, 1997; Adam, 1998).

Climate co-production

The academic literature distinguishes a descriptive and normative perspective on climate co-production (cf. Bremer and Meisch, 2017). The former uses the co-production idiom to analyse and interpret how society, science, nature, and climate are stabilized in diverse techno-scientific configurations, socio-natures, and cultural practices, and how these can at times get destabilized and reconfigured. The latter, in contrast, looks at how different actors collaborate to produce a public good of sorts, e.g. a public

Table 1. Structure of the *BEEWARE* project.

PHASE 1: Conducting semi-structured interviews with beekeepers in Vestland to determine how variability in the current climate impacts beekeeping as a set of practices.

PHASE 2: Comparing beekeepers' perceptions to numerical data (observations, extended range forecasts, climate projections) to investigate how knowledge of current and future climate can help mitigate weather and climate risk. In parallel: conduct focus groups with beekeepers to evaluate the use of extended range forecasts in real time.

PHASE 3: Holding a workshop that brings together stakeholders in beekeeping, pollination, and honey production in Vestland, as well as scientists, to co-produce informed knowledge and practices for mitigating risk related to weather and climate.

Section 1

policy, better knowledge for action, or the empowerment of marginalised groups. Both perspectives can be further differentiated in two descriptive and six normative respects (or lenses as in the co-production prism, cf. Figure 1). Depending on the co-production variant, (social) scientists play different roles. They are observers and critics of co-production processes in descriptive variants and participants in co-production processes in the normative variants.

BEEWARE engages with both forms of co-production. In the descriptive sense, it studies how the practice of beekeeping in the Vestland region is co-produced by beekeepers, bees, techniques and tools, worldviews, nature, and weather, and how it gets challenged by weather and climate risks. In the normative sense, *BEEWARE* aims to co-produce useful knowledges, practices, and policies for good climate adaptation with the intention to create extended science, public services, and governance structures (cf. Figure 1). Both approaches are inspired by two further ethical and philosophical considerations: more-than-human practices and seasonality.

Co-producing beekeeping as a more-than-human practice

The *BEEWARE* project takes an interest in the question of how bees take part in co-producing beekeeping. With this, it relates to two academic discussions. The first refers to the multispecies studies, which explore ‘a broad terrain of possible modes of classifying, categorizing, and paying attention to the diverse ways of life that constitute worlds’ and ask, ‘what is at stake – epistemologically, politically, ethically – in learning to be attentive to diverse ways of life’ (van Dooren *et al.*, 2016, 1). Within this context, scholars have studied how bees contribute to co-produce the world around them, and what humans can learn by seeing weather and climate through the bees’ eyes (‘weathering’) (cf. Phillip, 2014; 2020; Fenske, 2020).

Our second reference point is insect ethics that argues for a moral status of insects as non-sentient beings (cf. Gjerris *et al.*, 2016; van Loon and Bovenkerk, 2021). *BEEWARE* contributes to this debate, yet from a different angle. For bees are probably the only insects that live transculturally together with humans in their households or *oikos*. So, it is worth exploring eudaimonic lines of reasoning when it comes to *bee ethics* as a subgenre of insect ethics.

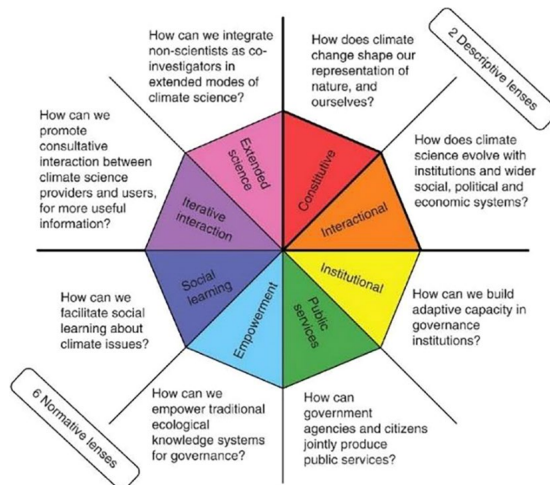


Figure 1. Co-production prism (Bremer and Meisch, 2017).

Co-producing beekeeping seasons

BEEWARE studies how seasonal ideas steer beekeeping practices in Vestland, and how they could be used to adapt to changes in weather and climate. With this, we build on insights of time ecology, according to which humans as natural beings are 'embedded in the temporal structures of nature. In particular, it is the rhythmicity of nature which allows for our orientation in time: the change of the seasons, of day and night, of activity and rest, of inhaling and exhaling [...]' (Adam *et al.*, 1997, 73). 'Seasons' mean different things to different people, depending on their geographical location, professions, and culture. They might see the year split up into different periods according to different rhythms. Weather and climate lead to changing seasons and impact the practices organized around them. So, we agree that the 'focus on time ecology facilitates not only a better appreciation of the multitude of mutually constitutive temporalities and rhythms of nature-culture' (Adam *et al.*, 1997, 75) – i.e. *BEEWARE*'s descriptive perspective – 'but also a deeper understanding of the degrees of freedom at the disposal of humans to create and construct temporalities of their choosing' (*ibid.*) – *BEEWARE*'s normative perspective.

Within the first project phase, we study the *Eigenzeiten* of beekeeping in Vestland. Based on these insights, we explore, in the third phase, together with beekeepers and other stakeholders such as fruit farmers dependent on pollination and representatives of beekeeper associations and governmental agencies, how ideas of alternative beekeeping seasons and related practices might support beekeeping in Vestland to adapt to climate change.

First insights

In May 2022, the project is in its first phase. So, very first findings can only stretch to insights about how beekeeping as a *social practice* (cf. Reckwitz, 2002) is co-produced, how it is seasonally patterned and how climate change is affecting this practice and its seasonal rhythms. At this early stage, three observations seem particularly relevant for us. First, there is not one practice of beekeeping but many. We found different forms of bodily performances, ways of understanding the world and making use of knowledge and tools, and varying rhythms and temporalities. Accordingly, also vulnerabilities to climate risks differ. Second, how beekeeping practices are co-produced depends on the (normative and evaluative) relationship of beekeepers to their bees. The most obvious example is the difference between the ends of a spectrum: hobby beekeepers and full-time professionals. What we learnt is that beekeepers see the bees as co-agents in the co-production of practices and seasonal rhythms. Third, the *BEEWARE* project presents a forecast to beekeepers and deliberates with them how it can become useful. Such a forecast shows the probability of a specific weather happening a couple of weeks in the future. It emerged that depending on the specific form of practicing beekeeping this tool has a different relevance for different beekeepers at different times.

Conclusions

BEEWARE explores how weather and climate risks – amplified by climate change – are challenging apiculture in the Vestland region. It studies how beekeeping is co-produced as a set of social practices, and what values, norms, symbols, meanings, and worldviews underpin this practice (cf. e.g. Velardi *et al.*, 2021). In addition, and in line with a narrative ethical perspective, the project goes beyond mere descriptive ethics by contributing to 'the value-oriented debate about the good life' and providing a hermeneutic framework for the normative question of the moral ought' (Haker, 2010, 3, own translation; cf. also Meisch, 2019, 6). *BEEWARE* engages beekeepers in deliberations about good beekeeping practices and the reasons about how to act in the face of weather and climate risk. Such deliberations are guided by insights how these practices are embedded in temporal, spatial and multispecies relations.

Acknowledgements

Many thanks to Barbara Adam and Leonie Bossert for discussing earlier versions of this paper with us. Scott Bremer had support from the CALENDARS project, which has received funding from the European Research Council under the EU Horizon 2020 research and innovation programme (Grant agreement 804150). Simon Meisch acknowledges funding for the CANALS project from Horizon 2020 Marie Skłodowska-Curie Actions, European Union (Grant Agreement No 895008).

References

- Adam, B. (1998). *Timescapes of modernity: the environment & invisible hazards*. Routledge, London.
- Adam, B. *et al.* (1997). Time for the environment: the tutzing time ecology project. *Time & Society* 6(1): 73-84.
- Alvsaker, S.C. *et al.* (2021). No må vi handle raskt! Online: <https://www.vestlandfylke.no/den-grone-leiartroya/no-ma-vi-handle-raskt/> (10 Nov 2021).
- Bastian, M. (2012). Fatally Confused: Telling the time in the midst of ecological crises. *Journal of Environmental Philosophy* 9(1): 23-48.
- Bremer, S. *et al.* (2021). Beyond rules: How institutional cultures and climate governance interact. *WIREs Climate Change* 12(6): e739. <http://doi.org/10.1002/wcc.739>.
- Bremer, S. *et al.* (2020). Portrait of a climate city: How climate change is emerging as a risk in Bergen, Norway. *Climate Risk Management* 29: 100236.
- Bremer, S. and Meisch, S. (2017). Co-production in climate change research: reviewing different perspectives. *WIREs Climate Change* 8(6): e482. <https://doi.org/10.1002/wcc.482>.
- Ceglar, A. and Toreti, A. (2021) Seasonal climate forecast can inform the European agricultural sector well in advance of harvesting. *npj Climate and Atmospheric Science* 4, 42.
- Drivdal, L. and van der Sluijs, J. (2021). Pollinator conservation requires a stronger and broader application of the precautionary principle. *Current Opinion in Insect Science* 46: 95-105.
- Fenske, M. (2020). Agency. In: Heimerdinger, T. and Tauschek, M. (eds), *Kulturtheoretisch argumentieren*. UTB, Münster, pp. 56-76.
- Gallai, N. *et al.* (2009). Economic valuation of the vulnerability of world agriculture confronted with pollinator decline. *Ecological Economics* 68(3): 810-821.
- Geldmann, J. and González-Varo, J. (2018). Conserving honey bees does not help wildlife. *Science* 359(6374): 392-393.
- Gjerris, M., Gamborg, C. and Röcklinberg, H. (2016). Ethical aspects of insect production for food and feed. *Journal of Insects as Food and Feed* 2(2): 101-110.
- Haker, H. (2010). Narrative Ethik. *Zeitschrift für Didaktik der Philosophie und Ethik* 2: 74-83.
- Karafyllis, N. and Friedmann, G. (2017). Kein Honigschlecken: Bienen als ‚Ökosystemdienstleister‘ und natürliche Mitwelt. In: Kirchhoff, T. *et al.* (2020). *Naturphilosophie*. Mohr Siebeck, Tübingen, 311-321.
- Knight *et al.* (2018). Reflections on and visions for, the changing field of pollination ecology. *Ecology Letters* 21: 1282-1295.
- Meisch, S. (2019). I want to tell you a story: how narrative water ethics contributes to re-theorizing water politics. *Water* 11(4), 631.
- Pschetz, L. and Bastian, M. (2018). Temporal design: rethinking time in design. *Design Studies* 56: 169-184.
- Phillips, C. (2020). Telling times: more-than-human temporalities in beekeeping. *Geoforum* 108: 315-324.
- Phillips, C. (2014). Following beekeeping: More-than-human practice in agrifood. *Journal of Rural Studies* 36: 149-159.
- Shove, E. *et al.* (eds) (2009). *Time, consumption and everyday life – practice, materiality and culture*. Berg, New York.
- Steffan-Dewenter, I. and Tschamtker, T. (2000). Resource overlap and possible competition between honey bees and wild bees in central Europe. *Oecologia* 122: 288-296.
- Reckwitz, S. (2002). Toward a theory of social practices. a development in culturalist theorizing. *European Journal of Social Theory* 5(2): 243-263.
- Van Dooren, T., Kirksey, E. and Münster, U. (2016). Multispecies studies: cultivating arts of attentiveness. *Environmental Humanities* 8(1): 1-23.

- Van Loon, M.S. and Bovenkerk, B. (2021). The ethics and mindedness of insects. In: Schübel, H. and Wallimann-Helmer, I. (eds). Justice and food security in a changing climate. Wageningen Academic Publishers, Wageningen, pp. 218-223.
- Velardi, S. *et al.* (2021). 'You treat them right, they'll treat you right': understanding beekeepers' scale management decisions within the context of bee values. *Journal of Rural Studies* 81: 27-36.
- Vercelli, M. *et al.* (2021). A qualitative analysis of beekeepers' perceptions and farm management adaptations to the impact of climate change on honey bees. *Insects* 12(3), 228.

10. Sustainable school food procurement in England: when there is a will, there is a way

F. Sabet

Graduate School of Education, University of Exeter, Heavitree Rd, Exeter, EX1 2LU, United Kingdom; fs374@exeter.ac.uk

Abstract

This exploratory study is a part of a larger ESRC-funded PhD on sustainable school food and discusses the implications of the findings on sustainable food procurement in primary schools in England. Data were collected using a mixed methods approach: methods included a survey to 8 schools and semi-structured interviews with 15 key informants. Participants included parents, caterers, local producers, school heads and school food experts. Findings uncovered current food procurement (FP) practices in schools in England, where local, seasonal, organic and sustainable food procurement (SFP) is considered as an overly idealistic ambition. Local producers are marginalised and catering staff disempowered by the over reliance on large multi-national wholesale corporations and industrial pre-packaged foods. However, producers and school caterers expressed a growing interest in transforming school food. Schools could potentially be a lucrative market for local producers while school caterers are driven to inspire best practice. These findings have significant implications on public food procurement in the UK of which schools account for the largest share. Schools, caterers, and local food producers could collaborate to initiate a dynamic school food procurement system aimed at shortening food chains, empowering kitchen staff and rewarding local and organic growers. Such a synergy could improve both health and sustainability standards of school food in England.

Keywords: food procurement (FP), sustainable food procurement (SFP), food education, economy of quality

Background and problem statement

Representing the largest share of public food procurement in England (De Laurentiis, 2018), schools are potentially a powerful vehicle to increase the sustainability of our food system. Schools, however, have not yet taken advantage of the opportunity to prioritise local, seasonal, and organic food (Morgan and Sonnino, 2013; Soil Association, 2019). Food procurement (FP) is the term we use to describe the current mainstream sourcing of school food and is different from the normative understanding of sustainable food procurement (SFP) which we adopt in this paper to refer to quality, local and organic food procurement in schools (Kimberlee *et al.*, 2013). Food quality here is reflected in the physical characteristics of food- freshness and nutritiousness, for example- as well as in the ethical considerations surrounding the processes of production and retailing. Therefore, SFP is a means for establishing a direct connection between food producers and consumers (Reid and Rout, 2016), and ensuring socio-economically sustainable and environmentally produced food (Sonnino, 2009).

Sonnino (2009) used the organic school catering revolution in Rome to exemplify the concept of 'economy of quality' to encourage a shift away from the conventional mass production of food towards a system which sees social, environmental and health considerations as fundamental. It accounts for the power dynamics in different interactions which cut across the food chain from production to consumption. In conventional food systems, consistency, predictability and food cost reduction are

prioritised over transparent food origins, freshness, nutritiousness, restored connections between farms and kitchens, and trust between producers and schools. Thus, for the school consumers, local producers represent the 'knowable' who generates a sense of trust in the safety, nutritiousness, and accessibility of food. Sustainable food procurement (SFP) in schools entails a complex and underresearched process of negotiations between the consumer and producer and the conclusion of which is often determined by hidden power dynamics in the food chain (Sonnino, 2009). While it is important to make the current processes underpinning school food procurement visible, Lever and Sonnino also stress the urgency for practical and transformational research which uncovers contextual barriers to change (Lever and Sonnino, 2022).

An understanding of SFP within an 'economy of quality' framework offers an alternative in the school food procurement system where power dynamics can be unpicked and rebalanced, trust can be restored, and quality improved. While uncovering some current FP practices in schools, this paper voices the different perspectives of multiple stakeholders on how a collective vision of 'economy of quality' could be realised through SFP practices in schools in England.

Method

A mixed methods approach was employed to collect and analyse data using both qualitative and quantitative methods (Cohen et al., 2018) in order to access views of multiple stakeholders and enhance the quality of overall data (Creswell and Clark, 2011).

Two data collection tools were used: a web-based survey and semi-structured interviews. The web-based survey ensured the reach of a large sample and included a mixture of close and open-ended questions, which generated a comprehensive account of the participants' perspectives. The purpose of using a survey was to explore the perspectives and experiences of parents and school staff on healthy and sustainable school food and how SFP should be reflected in school meals. The survey was developed on Qualtrics and divided into three sections: (1) participants' demographics; (2) school meals; and (3) food education. After piloting this tool, it was distributed through email to a group of headteachers in England where eight schools with different catering models and demographics gave their consent to take part. A total of 427 responses were recorded, 343 of whom were parents, 48 teaching staff, 11 members of the senior leadership team, and 7 school kitchen staff.

Using a purposive sampling, 20 key stakeholders with 10 years minimum experience in sustainable food system and/or school food, were contacted and invited to participate in the semi structured interviews. 15 school food, food educators and/or sustainable food system key informants (4 catering leads and chefs, 2 school heads and 1 multi-academy trust CEO, all three with sustainable school food visions, 3 local food producers of meat, fish and fruit and vegetables successively and 5 school food experts and campaigners) accepted to participate. The interviews lasted around an hour each and were conducted using Zoom. The interview protocol included questions covering sustainable catering and food education practices in schools.

For data analysis, a statistical descriptive analysis was conducted using IBM SPSS 20.0 on all close questions from the WBS. Text entered in the open-ended questions was collated in a single document and thematically analysed with the 15 interview transcripts on NVIVO 12. Following Braun and Clarke's (2019) Reflexive Thematic Analysis, I started by familiarising myself with the data, reading and highlighting extracts and arranging them within similar conceptualisations of SFP in schools. I, then, rearranged these codes into patterns which shaped the final themes, which were then, along with extracts, reviewed and finalised.

Section 1

Findings

Two core themes emerged from the qualitative data and will be presented with cross referencing to the quantitative findings in this section.

A collective aspiration for SFP in schools

Stakeholders agreed that SFP should be prioritised in schools with 34% of survey respondents choosing SFP as the number one criterion for sustainable school meals of whom 15% prioritised local, 12% seasonal and 7% organically sourced ingredients. Survey parent respondents also added:

School food should be organically produced.

The school kitchen should be more seasonally and locally driven.

Nevertheless, different stakeholders, particularly parents and caterers, believe SFP in schools might not even be a possibility due to the associated additional financial cost. For example, two parent and caterer respondents blamed cost as the main obstacle:

Sustainably sourced is preferable, local would be ideal, but anticipate cost prohibitive.
A parent respondent. (Survey parent respondent)

All of the above would be amazing but unsure whether budget allows for this?
(Survey catering respondent)

The perception of SFP as a far-fetched ideal is significant because any SFP initiatives cannot occur in schools without an existing belief of their practical feasibility. Furthermore, disempowering kitchen staff by the over-reliance of pre-packaged food and marginalising local and small producers is another barrier for achieving SFP in schools in England. Speaking of kitchen chefs, a Copenhagen school food consultant exclaimed in an interview: 'I am really wondering, what are you doing in a kitchen where everything is already made for you!'. Another catering lead added in an interview: 'There is no doubt that kitchen staff have been deskilled over the years by the overreliance on pre-packaged food'. Interviews with kitchen staff showed they are expected to follow the same menus and recipes and use two or three contracted corporate suppliers and restricted wholesale order lists. Decisions regarding menus, recipes and suppliers are made by catering companies' managers in head offices mainly for practical reasons and to control costs.

Furthermore, small, local, and organic producers have been marginalised and excluded from the school FP system, due to the perceived higher cost of their produce. For example, a CEO of a private catering company stressed in an interview:

Can we introduce organic food into schools on current pricing? No, as simple as that, the price model doesn't match, unless an organic producer wants to essentially change their pricing structure to fit with ours.

Supplying schools, on the other hand, was found to be an ambition for small, local producers, and many would try and accommodate school kitchens orders. For example, in an interview, an organic fruit and vegetable farmer reiterated, 'We would love to supply schools, in fact, we can plan our crops to accommodate school kitchens' needs if they tell in advance us what they want and how much of it.'

Moreover, local producers see supplying schools with fresh, quality and nutritious food, often inaccessible for many pupils at home, as an ethical responsibility. For example, a local fish supplier who had recently started supplying schools stated in an interview, ‘What I found with schools, and especially after having children is that I really like providing fish to schools because they are the future generations.’

As much as local small producers would like to supply schools, a school caterer-producer dialogue seems to be missing, caterers in schools are put off by the perceived additional costs associated with local produce. For example, a school food expert and campaigner confirmed:

It’s looking at seasonality and having regular conversations with suppliers, which for some reason, isn’t the school culture, like picking up the phone and saying, what do you have that I can have at a really good price? You know, as simple as that.

The need to prioritise SFP education

For school caterers to establish connections with local food suppliers and adapt their menus and recipes to be more attuned to what is sustainably available across the seasons, they need the autonomy, and the training. For example, the local fish supplier confirmed that:

They (*schools*) have been buying more local fish, I sent them oysters, mussels, scallops, salmon, tiger prawns, and line caught Pollock ... you can work within your budget, but the chefs were trained a little bit more in house to portion better.

Secondly, the interdependency between what children eat and what they learn about food in school has come up as a dominant theme in the findings of this study. Prioritising SFP in schools should not only be reflected in school food procurement practices but also be communicated to pupils both during and outside lunch time. For example, a school meals expert from Copenhagen illustrated:

I would think that what is important for children is this connection, to understand what a carrot is, where it comes from, why they taste a difference between one that’s been growing in soil, and one that’s been growing in pesticides and understanding the whole circle of life that we are part of, and that we are not sitting on top of it, but we are part of a whole system and that our actions have an impact everywhere.

The majority of survey respondents (89%) said that school meals should be used as a learning opportunity for pupils in schools. The actual school kitchen practices including food procurement, cooking and serving can promote pupils’ understanding of SFP. For example, a respondent in the survey elaborated, ‘Serving organic and more variety of seasonal, local, and environmentally friendly meals to choose from, not just boring pizza, pasta, jacket potatoes, fish fingers, is educational in itself’.

Respondents also suggested that schools should deliver food education including food growing, farm visits, and cooking lessons, and that those should go hand in hand with kitchen practices in promoting pupils’ experiences of SFP. For example, a respondent in the survey added:

Food education and the school menu work in tandem, schools have the responsibility of educating the children on the food included in the meals and encouraging them to try new foods. The schools / teachers should be jointly responsible.

Section 1

Prioritising SFP should not only be reflected in the food provision, but also in food education. A school catering lead and campaigner stressed, 'It is essential that they are learning about food at the same time as being provided a healthy meal.'

Education was perceived as necessary, not only for pupils but also for kitchen staff, to enable them to navigate such a complex task. Practicing SFP will entail juggling a seasonally changing availability list, managing tight budgets, pupils' preferences, parents' expectations while fulfilling the school food standards. Data, however, shows that caterers in schools need to be trusted and given autonomy to transform the existing practices. A catering regional manager in a catering company stated, 'I do recognise that our menu could be better. But it would take I think schools complaining (*to the company*) and backing me really, for changes to be made.'

A school food expert and educator addressed this aspect in an interview by adding:

You want food that is a bit inspiring and a little bit weird sometimes and that can only come if you let chefs and cooks be creative. The problem is with big catering corporations, they have very set menus for kind of convenience... (To) grab a bit of this, add a bit of that, you can't, because you must stick to this kind of quite formal menu.

Discussion and recommendations

Despite a collective aspiration towards SFP in schools, different stakeholders in this study uncover multiple barriers to SFP in schools in England. Tight school food budgets and the dominant convenience culture in school food leaves pupils with a limited variety of food on the plate, kitchen staff restricted in practice, and local food producers disregarded, all are conditions not conducive for prioritising SFP in schools. Such conditions are expected to persist under the compounded economic pressures induced by Covid-19, Brexit, and the Russian-Ukrainian war.

This study indicates, however, that local producers are keen on winning a share of school food business but are just not invited to, on the other hand, kitchen staff are not trusted to enact sustainable change. These unbalanced power dynamics are significant within the school food system, firstly, because powerful actors end up shaping quality to their advantage which then determines who has access to the market, who dominates it and who ends up being pushed out. Food quality, therefore, is socially and politically constructed through complex practices and values of different stakeholders (Sonnino, 2009). Secondly, actors who are empowered through education are more likely to take initiatives and challenge the status quo (Wallerstein and Bernstein, 1988). Furthermore, this study showed that schools, caterers, parents, local producers and food experts have different perspectives of SFP which calls for a practical understanding of SFP in schools where synergies between socio-economic and environmental goals can be achieved, such contextual understanding of SFP in schools in England is currently missing.

Exceptional initiatives for change have emerged such as the Bath and Northeast Somerset (B&NES) dynamic school food procurement pilot. B&NES provided 7,000 school meals using suppliers of fresh meat, fruit and vegetables from within the local region which was made possible through innovation partnership, creative kitchen operations and simplified procurement procedures and documentations (Howroyd, 2016). Evaluating such pioneering models can contribute towards shaping a practical understanding of SFP for schools in England. The Food for Life initiative highlighted the urgency for food education as part and parcel of SFP in schools (Kimberlee *et al.*, 2013), which is supported by findings from this study. Therefore, both innovative collaborations and education are necessary to involve small local producers in school food. Challenging the current FP system in schools will only be possible if stakeholders are connected and informed. The affordability of SFP can only be evidenced through

collaborative SFP interventions in schools. Adaptability, creativity, and compliance with school food standards are skills which can be fostered in school kitchens through training.

Schools hold the largest share of public food procurement in England and potentially is a missed opportunity to transform public FP in England. A SFP alliance between producers and consumers which is governed by a new understanding of 'economy of quality' can transcend the actual food products and bring other hidden elements of the food system to the forefront, such as production methods, retailing, education and eating culture. The proposed SFP alliance between local food producers, caterers and schools is at the heart of this study and its recommendations and can bring environmental, economic, and social benefits which the prevailing school FP in England is currently missing. A comprehensive framework for SFP in schools reflective of 'economy of quality' and integrated in updated School Food Standards (DoE, 2021) is critical in guiding a school food transformation in England. Practical interventions are urgent to put SFP theoretical ambitions to the test and to exemplify how an alliance between schools, caterers and local producers could be facilitated in multiple contexts and for what outcomes.

References

- Braun, V. and Clarke, V. (2019). Reflecting on reflexive thematic analysis. *Qualitative Research in Sport, Exercise and Health*, 11(4), 589-597. <https://doi.org/10.1080/2159676X.2019.1628806>
- Cohen, L, Manion, L. and Morrison, K. (2018). *Research in Education* (Eighth edi). Routledge.
- Creswell, J.W. and Clark, P. (2011). *Designing and Conducting Mixed Methods Research* (2nd ed.).
- De Laurentiis, V. (2018). Environmental sustainability assessment of the primary school catering sector. July.
- DoE. (n.d.). The School Food Standards. 2021. <https://www.gov.uk/government/publications/school-food-standards-resources-for-schools/school-food-standards-practical-guide>
- Kimberlee, R., Jones, M., Morley, A., Orme, J. and Salmon, D. (2013). Whole school food programmes and the kitchen environment. *British Food Journal*, 115(5), 756-768. <https://doi.org/10.1108/00070701311331535>
- Lever, J. and Sonnino, R. (2022). Food system transformation for sustainable city-regions: exploring the potential of circular economies. *Regional Studies*, 0(0), 1-13. <https://doi.org/10.1080/00343404.2021.2021168>
- Morgan, K. and S.R. (2013). *The school food revolution: public food and the challenge of sustainable development*. Routledge.
- Reid, J. and Rout, M. (2016). Getting to know your food: the insights of indigenous thinking in food provenance. *Agriculture and Human Values*, 33(2), 427-438. <https://doi.org/10.1007/s10460-015-9617-8>
- Richard Howroyd. (2016). Provision of School Food in Bath. Available at: https://sppregions.eu/fileadmin/user_upload/Tenders/SPP_Regions_Tender_model_food_contract_final.pdf
- Sonnino, R. (2009). Quality food, public procurement, and sustainable development: The school meal revolution in Rome. *Environment and Planning A*, 41(2), 425-440. <https://doi.org/10.1068/a40112>
- Wallerstein, N and Bernstein, E. (1988). Freire's ideas adapted to health education. *Health Education Quarterly*, 15(4), 379-394.

11. Assessing the food security implications of climate change on global food trade

G.N. Sixt^{1,2*} and K. Strzepek^{1,2}

¹Abdul Latif Jameel Water and Food Systems Lab, Massachusetts Institute of Technology, 77 Massachusetts Ave., Cambridge, MA 02139, USA; ²Food and Climate Systems Transformation (FACT) Alliance, 77 Massachusetts Ave., Cambridge, MA 02139, USA; sixt@mit.edu

Abstract

As the ripple effects of climate change accelerate through the complex and interdependent global food systems, the widely accepted paradigm that a country's food security increases with national wealth will be challenged. This threat is particularly relevant for countries that have limited capacity for domestic food production and that rely heavily on imports to meet demand for food. Rising temperatures and extreme weather events are expected to increasingly disrupt agricultural productivity in many food-exporting countries, causing food price instability and threatening rural livelihoods and sustainable food security. The methodology employed for this analysis was the linkage of The Global Trade, Assistance, and Production (GTAP) Data Base with the International Food Policy Research Institute's (IFPRI) IMPACT modelling framework. For this analysis, GTAP data are used for identifying current bilateral trade dynamics, and projections on climate change impacts on food production, demand, and trade for 2050 from IFPRI's 'IMPACT Projections of Food Production, Consumption, and Hunger to 2050, with and without climate change: Extended Country-level Results for 2019' are used. Drawing from the model outputs, a new index was developed to assess the food security vulnerability due to climate change impacts on food trade. In phase 1, Food security was limited to six main food commodity groups: Grains, Rice, Fruits and Vegetable, Oil Seeds, Meat and Milk, and Processed Foods. This paper draws from the IMPACT results for 2050 based on the RCP 8.4 emission scenario and the 3.0 Shared Socio-economic Pathway which shows significant impacts on World Market Prices, total global food production, and trade.

Keywords: climate change, food trade, food security, food trade vulnerability, bi-lateral trade

Introduction

The 2009 Declaration of the World Food Summit defines food security as 'when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life' (FAO, 2009). Food security is built on four pillars: availability (sufficient supply of food), access (sufficient resources and market availability), utilization (sufficient knowledge of food preparation and dietary diversity do achieve healthy nutritional status), and stability in achieving the other three dimensions over time (FAO, 2009, 2008; Hassen and Bilali, 2019).

The effects of climate change pose a long-term threat to all four pillars of food security. Multiple, interconnected impacts are anticipated, key among them: crop yields are predicted to decline for all major crops due to changes in precipitation patterns, extreme weather events, and increasing competition from weeds and pests (Table 1) (CDC, 2020; IFPRI, 2019); pests, disease, heat stress, reduced quality of animal feed, and changes in water temperature will affect livestock and fisheries (CDC, 2020; USEPA, 2021); climate change-induced geopolitical instability and infrastructure damage could disrupt food distribution systems (Benton *et al.*, 2020; CDC, 2020); the nutritional quality of many crops will

decrease with elevated atmospheric CO₂ (CDC, 2020); and yield loss and supply chain disruption, in addition to population and economic growth, will drive increases in world market food prices (Table 2).

The impacts of climate change could trigger a worldwide food crisis by the latter part of this century (IPCC, 2019), and the negative effects of climate change on food production are already evident. The widely accepted paradigm that a country's food security increases with economic development may no longer hold true in the coming decades. Even wealthy nations may not be able to ensure future food security as the ripple effects of climate change accelerate through the complex and interdependent global food system. This threat is particularly relevant for countries – such as the rich Arab Gulf countries – that have limited capacity for domestic food production and rely heavily on imports to meet demand for food. However, even wealthy countries that are major food producers are at risk. Rising temperatures and extreme weather events are expected to increasingly disrupt agricultural productivity in the United States and other producer countries, causing food price instability and threatening rural livelihoods and sustainable food security (USGCRP, 2018).

The COVID-19 pandemic and the increase in climate change-driven extreme weather events have laid bare the fragility of global food supply chains. A confluence of factors is causing surging global food prices, putting staple meals out of reach for millions of people (Taylor, 2021). Climate change, population growth, changing diets, and a food system reliant on global trade increase the likelihood of persistent price volatility, supply disruptions, and food insecurity. Such conditions increase the risk for political instability.

Table 1. Global average of percent change in yield due to climate change 2020-2050 (IFPRI, 2019).

Commodity	% change in yield
Grains	-8.6
Rice	-7.9
Fruits and vegetables	-5.9
Oilseeds	-8.2
Meat and milk	-3.5
Processed foods	n.a.

Table 2. Changes in world market prices from 2020-2050 not factoring in climate change (CC) and factoring in climate change impacts to world market prices.¹

Commodity	World market prices (US\$)			% increase from CC
	2020	2050: no CC	2050: CC	
Grains	230	259	336	30
Rice	396	457	567	24
Fruits and vegetables	952	1,145	1,311	14
Oilseeds	485	511	669	31
Meat and milk	2,713	2,832	2,955	4
Processed foods	640	743	851	15

¹ Percent increase from CC indicates projected increase in price over 2050 No CC prices (IFPRI, 2019).

Section 1

There is an imminent need to understand and assess the factors affecting future food security to guide resilient production, trade, and foreign policy in a changing climate. However, there remain significant knowledge gaps regarding how different climate scenarios may affect agricultural productivity *and* its related impacts on global food supply chains and security.

Food trade vulnerability

In the sometimes-competing objectives of food self-sufficiency and food security, the role of food imports is a key factor. While the globalized food system has led to lower food prices and wider product choices for many consumers, it has also driven agricultural specialization and created a situation where many food staples are produced by a limited number of countries (Hamilton *et al.*, 2020). This, combined with an increasing reliance on trade to meet demand, has created a global food system in which food production is deeply interconnected with energy and finance markets, and one where a shock in a major food producing country can have food security ripple effects around the globe (Tadasse *et al.*, 2016).

Thus, when viewed through the lens of food trade vulnerability, the food security risk to a nation is a function of: (1) the proportion of food demand that is met through imports vs production (food self-sufficiency), (2) the socioeconomic, socio-political, and agricultural situation of food exporting nations (geopolitical stability), (3) ability to increase local food production (local climate/land/water resources), and (4) world market prices (economy).

There is a pressing need for the development of tools to assess food security as a function of food trade to guide policymaking, development activities, and private sector investment. Developing a deeper understanding of the complex nexus of food systems, trade, and climate change can aid in the development of new policy frameworks that are consistent with the complex realities of this nexus (Friel *et al.*, 2020).

There has been a shift over the last two decades toward regional and bilateral food trade agreements, which sit outside multilateral trade rules (Burnett and Murphy, 2014; Friel *et al.*, 2020). The food commodity trade between countries is central to factors (1) and (2) above. The Global Trade Analysis Project (GTAP) (Aguiar *et al.*, 2019) is a global economic database of commodity imports and exports between 121 countries, representing 98% of global GDP and 92% of global population. This enables assessment of existing conditions but cannot model changes in the future. Domestic food demand and production and the ability to fill any gaps with imports is needed to analyse factors (3) and (4) outlined above.

Other approaches to modelling food trade rely on global economic models in which trade for food and agricultural commodities is quite aggregated, limiting their utility for modelling bilateral food trade under a range of economic and climate scenarios. The International Food Policy Research Institute's (IFPRI) IMPACT model is spatially detailed and is linked to water and crop models that can project climate change impacts to yields, production, demand, and trade, but the model projects trade within a single world market and not bilaterally. Other existing models are unable to project bilateral trade under future climate scenarios.

Building a new food trade and vulnerability index

This work presents the initial findings in the development of a new Food Trade and Vulnerability Index by the Massachusetts Institute of Technology's Jameel Water and Food Systems Lab (J-WAFS) and IFPRI, as part of the Food and Climate Systems Transformation (FACT) Alliance – a global research network aimed at supporting food systems transformations through stakeholder-driven convergence research. Phase 1 of the analysis is a proof-of concept, and preliminary work has used the

Gulf Cooperation Council (GCC) countries and the rest of West Asia as a case study. Table 3 presents preliminary findings from this analysis. Feedback from EURSAFE 2022 conference participants will help to guide the further development of the Index.

For this analysis, we utilized the latest data from the GTAP database. FAO-based agricultural production targets are incorporated into the GTAP 10A database build stream to produce a special release of the GTAP database. For each country/region, the database reports production, intermediate and final uses, international trade and transport margins, and taxes/subsidies for 65 economic sectors and 12 agricultural sectors (Aguiar *et al.*, 2019).

Phase 2 will refine the Index for analysis of multiple future climate and economic scenarios. The further development of the Index will expand collaboration to an additional FACT Alliance members, Oxford Martin School and Ethiopian Institute for Agricultural Research, and the United Arab Emirates University for ‘deep-dive’ analyses that will engage stakeholders to improve index accuracy at the national and sub-national levels. A key element of Phase 2 will be the addition of bi-lateral trade modelling to the IMPACT model.

We will further refine the Index by conducting detailed country-level food security analyses at sub-national scales and across various socioeconomic groups, allowing key populations to be targeted in the modelled nation. To perform this analysis, IFPRI’s Rural Investment and Policy Analysis (RIAPA) model will be applied. RIAPA measures how climate change impacts are mediated through prices and resource reallocations and ensures that resource and macroeconomic constraints are respected (e.g. when inputs or foreign exchange are limited). RIAPA provides a consistent ‘simulation laboratory’ for quantitatively examining value chain interactions and spill overs at national, sub-national, and household levels. This allows for distributional issues to be addressed in the Index.

Table 3. Imports for key food commodities by GCC and West Asian Countries.

Commodity	GCC						Rest of West Asia							
	Bhr	Kwt	Om	Qat	Sau	UA	Arm	Aze	Geo	Irn	Isr	Jor	Tur	Other
Grains	12	33	21	11	8	19	3	5	20	5	20	20	4	2
Rice	49	19	30	33	32	24	0	0	11	0	5	4	6	0
Fruits and vegetables	5	6	6	4	3	2	0	0	0	0	0	0	0	1
Oilseeds	14	25	49	12	25	25	4	1	29	3	13	20	7	2
Meat and milk	6	7	7	6	5	5	0	1	2	0	0	3	0	1
Processed foods	3	4	3	3	2	1	0	1	0	2	1	2	0	1

¹ Bottom set of rows show a measure of the vulnerability of a commodity to import embargoes and is the inverse of food security: 0-5 = Low Vulnerability; 6-10 = Medium Vulnerability; 11-15 = High Vulnerability; >15 Severe Vulnerability. Vulnerability index created by dividing the percent of total demand for food commodity met from imports by the number of countries supplying ~80% of imports² (Aguiar *et al.*, 2019; Author calculations for rice from: United Nations, 2022; FAO, 2022).

² Number of countries it takes to pass the 80% threshold (e.g. if 4 countries supply a total of 60% of imports and 5 countries supply a total of 82%, the number of countries will be 5).

Application of the index to policy and further development

The Food Trade and Vulnerability Index will provide valuable insight into the dynamics of food trade and its relationship to food security under both current and future climate conditions. Its focus on commodity crops is reflective of the reality that the current food system relies on commodity crops to meet the majority of demand. This has implications not only for global commodity food trade, but also for debates around the role of international trade in achieving food sovereignty goals (e.g. Burnett and Murphy, 2014; Dekeyser *et al.*, 2018; Siwior, 2021) and on the role of local food production in meeting demand (e.g. Kinnunen *et al.*, 2020; Peters *et al.*, 2009). Thus, the Index is intended to be used as part of a broader transdisciplinary approach.

The insight the Index will provide is very much place dependent, and its application will vary for import-dependent countries and export-oriented countries. In some situations (e.g. in some non-GCC West Asian countries) it may highlight opportunities to increase and/or diversify domestic food production. In other situations, where limited resources exist to expand domestic production (e.g. the GCC countries), it may inform trade and foreign policy or provide insight on the need for domestic nutrition programs with the goal of promoting dietary changes. For example, this preliminary analysis demonstrates that sufficient diversification of food import suppliers can help hedge the risk of relying on imports for achieving food security (Table 3).

The Index's utility as a tool for policymakers is in highlighting resilience and fragility in a country's existing food import regime. In the broader context of transforming food systems towards greater sustainability, resilience, health, and equity, the Index will support policy and investment decision making around whether and how to increase domestic production in a given country.

Developing a better understanding of yield and production impacts under future climate scenarios, across a range of countries and regions, offers an opportunity for considering different food production scenarios in the planning process and for engaging smallholder and medium size producers early in agricultural transition planning processes. It could help to guide investment in building capacity for more climate resilient and sustainable production regimes, inform investment in food system supply chain infrastructure, and support strategic bilateral donor investment by high-importing wealthy nations towards building capacity for more climate-resilient-and-sustainable food production systems. Central to meeting these goals is the strategic engagement of stakeholders through the development of the Index to ensure its utility to end users.

The Index will continue to be refined over the course of a three-year project (beginning Fall 2022) as a tool that highlights the vulnerability of food security in terms of domestic production and food and fodder imports. A critical equity and ethical consideration in the ongoing development of the Index is ensuring that it does not become a tool to continue the current food production paradigm that is a key driver of climate change and that makes food systems and food systems actors vulnerable to its impacts. The Index must address the needs of and help support opportunities for smallholder producers, smaller agri-food companies, and producer collectives.

Central to addressing these equity and ethical considerations is developing the Index to support the planning activities of a wide variety of stakeholders including: government agriculture, economic, and trade ministries; bilateral and multilateral donor organizations; NGOs and philanthropic foundations; and private sector actors. The ongoing development of Index, while being data-driven for current trade paradigms and model-driven for future climate scenarios, will be guided by consultation with a range of stakeholders representing these groups. To ensure actionable outcomes, we will work with the broader

FACT Alliance network to engage stakeholders for guidance on how the Index is framed and packaged and to strengthen the utility of the Index at both the national and sub-national levels.

References

- Aguiar, A., Chepeliev, M., Corong, E.L., McDougall, R., van der Mensbrugge, D., 2019. The GTAP Data Base: Version 10. *J. Glob. Econ. Anal.* 4, 1-27. doi:<http://dx.doi.org/10.21642/JGEA.040101AF>
- Benton, T.G., Fanzo, J., Herrero, M., Nelson, R.J., Bageant, E., Buckler, E., Cooper, K., Culotta, I., Fan, S., Gandhi, R., James, S., Kahn, M., Lawson-Lartego, L., Liu, J., Marshall, Q., Mason-D, D., Mathys, A., Mathys, C., Mazariegos-Anastassiou, V., Miller, A., Misra, K., Mude, A.G., Shen, J., Majele Sibanda, L., Song, C., Steiner, R., Thornton, P., Wood Socio, S., 2020. Socio-technical innovation bundles for agri-food systems transformation, Report of the International Expert Panel on Innovations to Build Sustainable, Equitable, Inclusive Food Value Chains. Cornell Atkinson Center for Sustainability and Springer Nature, Ithaca, NY and London.
- Burnett, K., Murphy, S., 2014. What place for international trade in food sovereignty? *J. Peasant Stud.* 41, 1065-1084. doi:10.1080/03066150.2013.876995
- Centers for Disease Control and Prevention (CDC), 2020. Food security [WWW Document]. *Clim. Heal. Clim. Eff. Heal.* URL https://www.cdc.gov/climateandhealth/effects/food_security.htm (accessed 11.30.20).
- Dekeyser, K., Korsten, L., Fioramonti, L., 2018. Food sovereignty: shifting debates on democratic food governance. *Food Secur.* 10, 223-233. doi:10.1007/S12571-017-0763-2
- FAO, 2022. FAOSTAT [WWW Document]. URL <https://www.fao.org/faostat/en/#home>.
- Food and Agriculture Organization (FAO), 2009. Declaration of the World Summit on Food Security. Rome.
- Food and Agriculture Organization (FAO), 2008. An Introduction to the basic concepts of food security [WWW Document]. *Food Secur. Inf. Action Pract. Guid.* URL <http://www.fao.org/3/al936e/al936e00.pdf> (accessed 2.8.21).
- Friel, S., Schram, A., Townsend, B., 2020. The nexus between international trade, food systems, malnutrition and climate change. *Nat. Food* 1, 51-58. doi:10.1038/s43016-019-0014-0
- Hamilton, H., Henry, R., Rounsevell, M., Moran, D., Cossar, F., Allen, K., Boden, L., Alexander, P., 2020. Exploring global food system shocks, scenarios and outcomes. *Futures* 123. doi:10.1016/j.futures.2020.102601
- Hassen, T. Ben, Bilali, H. El, 2019. Food security in the Gulf Cooperation Council countries: challenges and prospects. *J. Food Secur.* 7, 159-169. doi:10.12691/jfs-7-5-2
- Intergovernmental Panel for Climate Change (IPCC), 2019. Climate change and land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems.
- International Food Policy Research Institute (IFPRI), 2019. IMPACT Projections of food production, consumption, and hunger to 2050, with and without climate change: extended country-level results for 2019 GFPR Annex Table 5. doi:10.7910/DVN/BMPQGN
- Kinnunen, P., Guillaume, J.H.A., Taka, M., D'Odorico, P., Siebert, S., Puma, M.J., Jalava, M., Kumm, M., 2020. Local food crop production can fulfil demand for less than one-third of the population. *Nat. Food* 1, 229-237. doi:10.1038/S43016-020-0060-7
- Peters, C.J., Bills, N.L., Wilkins, J.L., Fick, G.W., 2009. Foodshed analysis and its relevance to sustainability. *Renew. Agric. Food Syst.* 24, 1-7.
- Siwior, P., 2021. Food Sovereignty: Definition, Origin of the Concept, and Sustainable Food System, in: Filho, W.L., Azul, A.M., Brandli, L., Salvia, A.L., Özuyar, P.G., Wall, T. (Eds.), *No Poverty*. Cham: Springer International Publishing, pp. 343-352.
- Tadasse, G., Algieri, B., Kalkuhl, M., Von Braun, J., 2016. Drivers and triggers of international food price spikes and volatility, in: Kalkuhl, M., von Braun, J., Torero, M. (Eds.), *Food Price Volatility and Its Implications for Food Security and Policy*. pp. 59-82. doi:10.1007/978-3-319-28201-5_3
- Taylor, A., 2021. Surging prices put staple meals out of reach, from Nigerian jollof rice to Russian pasta and Argentine steak. *Washington Post*.
- United Nations, 2022. UN Comtrade Database [WWW Document]. URL <https://comtrade.un.org/>

Section 1

United States Global Change Research Program (USGCRP), 2018. Fourth national climate assessment, volume II: impacts, risks, and adaptation in the United States. doi:10.7930/NCA4.2018

USEPA, 2021. Climate Impacts on Agriculture and Food Supply [WWW Document]. Clim. Chang. Impacts. URL <https://archive.epa.gov/epa/climate-impacts/climate-impacts-agriculture-and-food-supply.html> (accessed 2.9.21).

12. Impact of the COVID-19 pandemic on food and livelihood security of agricultural households in India

D. Veluguri^{1*}, A. Awasthi², A. Roy³, P. Prabhakaran³ and L. Jaacks^{1,3,4}

¹Global Academy of Agriculture and Food Security, University of Edinburgh, Edinburgh, United Kingdom;

²Harvard India Research Center, Mumbai, India; ³Public Health Foundation of India, Gurugram, India;

⁴Harvard T.H. Chan School of Public Health, Boston, MA, USA; d.veluguri@sms.ed.ac.uk

Abstract

In May 2021, India reached a record number of COVID-19 cases, with more than 9 million new cases in just one month. This second peak, unlike the first in 2020, also severely affected rural areas, where households are largely dependent on agriculture. In May 2020, just after the nationwide lockdown, we conducted telephone surveys with 1,437 farmers across 12 states. The same farmers were surveyed again in June 2020 (follow-up 1), July-August 2020 (follow-up 2), and July-August 2021 (follow-up 3). This paper focuses on findings from follow-up 3. In July-August 2021, 75% of households reported earning less income as compared to January 2021; 25% reported selling assets due to COVID-19; and 30% reported borrowing money for COVID treatment. With regards to government support, 40% of households reported receiving cash (10%), food (34%), or medical supplies (6%) in the past month. Food insecurity increased over the course of the pandemic, with 29% reporting worrying about food in July-August 2021 compared to 21% in July-August 2020 ($P < 0.001$). Landless and small farmers were significantly more likely to report worrying about food ($P < 0.001$) and eating less food ($P < 0.001$) compared to large farmers, despite being more likely to receive food rations ($P < 0.001$). Results indicate that agricultural households in India faced significant economic distress and higher food insecurity in July-August 2021 compared to the same period in 2020, neither of which were fully mitigated by government support.

Keywords: COVID-19, South Asia, farmers, income, government support

Introduction

India declared a nationwide lockdown in April of 2020 in response to the COVID-19 pandemic. Restrictions were steadily eased between May and August of 2020, while the number of daily new cases peaked at just under 100,000 between August and October of 2020. A second wave, credited to the Delta variant of the virus, swept the country from April to June of 2021. Daily new cases peaked at over 400,000 in the month of May 2021 (CSSE, 2022). This resulted in various city-specific and state-level restrictions on travel, gatherings, and hospitality venues as well as school closures.

The first lockdown had a significant financial impact across the country. By April-June of 2020, urban unemployment was 21%, more than double the number for the same period in the previous year, pre-COVID-19 (PLFS, 2021). Income loss and unemployment also led to significant food insecurity across the country. Various studies on informal workers, migrant workers, and marginalized households in both urban and rural areas reported that between one-fourth and three-fourths of households reported eating less food in April-May 2020 than before the pandemic (Drèze, 2021).

In order to understand the impact of the national lockdown on agricultural households, we conducted a survey in May 2020. A total of 1,437 agricultural households were interviewed from the twelve largest states by cultivated area (in alphabetical order): Andhra Pradesh, Bihar, Gujarat, Haryana, Karnataka,

Section 1

Madhya Pradesh, Maharashtra, Punjab, Rajasthan, Telangana, Uttar Pradesh, and West Bengal. Following this baseline, two follow-up surveys were conducted in June 2020 and July-August of 2020.

Results indicated that landless farmers were more likely to be food insecure, despite being more likely to receive food rations. A majority of households received COVID-19 specific food rations (51%) in April-May 2020, and also received some form of cash transfer (non-COVID specific) from the government between April-August 2020 (64%) (Jaacks *et al.*, 2021; Pandya, 2021). Farmers growing two or more crops were protected from reduced dietary diversity in the face of market disruptions during the lockdown; but nonetheless, diet diversity remained low throughout the pandemic (Connors, 2021).

While relatively few rural households reported being infected by COVID-19 during the first wave of the pandemic, news reports indicated that rural households reported a higher number of infections during the second wave (Delta) (The Hindu, 2021). Other news reports highlighted a lack of adequate testing, medical supplies, and healthcare providers. Hospitals across the country were overflowing, with numerous reports of families unable to access care (Arasu, 2021).

Concerned about these new circumstances in rural areas, we conducted a third round of follow-up surveys in July-August 2021 with a total of 734 agricultural households responding, comprised of 676 participants from the baseline survey (47% response rate) and 58 new participants. The survey, results of which are presented herein, covered: (1) receipt of government support in the form of cash transfers, food rations, and medical supplies in the past month; (2) change in household income compared to January of 2021; (3) sale and mortgage of assets, cost of treatment, and loans due to medical expenses; (4) incidence of COVID-19, including symptoms in the past month; and (5) food security and diet diversity.

Methods and analysis

Details of the survey methodology are published elsewhere (Connors, 2021). Briefly, farmers for the baseline survey were identified with the support of civil society organizations and through snowball sampling. The third follow-up survey identified additional landless and small farmers through snowball sampling as they were underrepresented in our baseline survey. Surveys were conducted telephonically in eight regional languages, with each survey taking approximately 10 minutes to complete. Data cleaning, management, and analysis were conducted using Stata release 16 (StataCorp LLC, College Station, Texas). Results were reported according to farm size with differences across farm sizes tested using chi-square tests for binary and categorical variables and using analysis of variance for continuous variables. $P < 0.05$ was considered statistically significant.

Ethics

This study was reviewed and approved by the Harvard T.H. Chan School of Public Health Institutional Review Board (Protocol #: IRB20-0689) and the Public Health Foundation of India Institutional Ethics Committee (Protocol #: TRC-IEC 438.1/20). Informed verbal consent was obtained from all respondents.

Results

Demographic characteristics

Respondents were mostly male (95%) [compared to 30% of cultivators and agricultural workers classified as women (Government of India, 2011)] with an average age of 42 years [compared to the average age

of 50 years for farmers in India (Ministry of Agriculture & Farmers Welfare, 2021)]. A majority had completed either primary (21%) or secondary (38%) schooling, while 32% had graduate or professional degrees (compared to 4.2% of farmers with degrees nationally). About 44% of households were small and marginal farmers (owning <2 ha of land) while 22% were medium (2–4 ha) and 27% were large (>4 ha). This is compared to 86% small and marginal, 13% medium, and less than 1% large farmers nationally (Ministry of Agriculture & Farmers Welfare, 2020).

Income and government support

A majority of respondents (75%) reported earning less income in July as compared to January of 2021. Report of income-loss did not differ across farm sizes ($P=0.23$). Agricultural household income in India is composed of income from cultivation (37%), wages (40%), livestock (16%), and non-farm income (6%) (NSSO, 2021). During the lockdown period of April 2020, 80% of households reported a decline in wage-based income and 49% reported a decline in livestock income (Jaacks, Veluguri *et al.*, 2021), with only marginal recovery by July–August 2020 (Pandey, 2021). This income decline is in the context of an increase in wage-income (Kumar, Anwer *et al.*, 2020) and an increase in household income observed over a 15-year period pre-COVID-19 (NSSO, 2021).

Participants were asked if they received any of three types of government support: cash, food rations, or medical supplies. These were selected because cash-based subsidies and food rations are the most common form of state-distributed direct subsidies in India (Ministry of Finance, 2022). About 40% of households surveyed reported receiving any form of government support in the past month, with small and marginal farmers (48%) significantly more likely to do so as compared to large farmers (29%) ($P<0.001$). Just over one-third of households (34%) reported receiving food rations from the government, of which 53% received rations through a COVID-19-specific program. Landless (43%), and small and marginal (42%) farmers were most likely to receive food rations, compared to medium (30%) and large farmers (9%) ($P<0.001$), which is as expected given that the food distribution program targets families in need.

Our survey did not distinguish between types of cash transfer and respondents could report money received through various state or central government programs. While some schemes are farmer-specific, like PM-KISAN (an income support scheme for all landed farmers by the central government) and Rythu Bharosa (a cash-based input support scheme for landed farmers in the state of Telangana), others like Ujjwala Yojana benefits (cash assistance to women for clean cooking gas) are need-based transfers. Only 11% of agricultural households reported receiving a cash transfer in the past month; of these, only 9% said it was due to COVID-19 rather than standard government support. Small and marginal farmers were twice as likely to receive a cash transfer: 15% compared to 8% of large farmers, and zero landless farmers.

COVID-19 and related spending

Around 18% of households reported having family members who tested positive for COVID-19 since January 2021 (i.e. past ~6 months), with large farmers most likely to report the same ($P<0.001$). This was likely due to higher testing among large-farm households, rather than higher rates of infection, given that COVID-19 symptoms in the past month did not differ significantly by farm size ($P=0.38$). On symptoms in the past month, 10% of respondents reported that they or another adult in their household had three COVID-19 symptoms: a dry cough, fever, and shortness of breath. However, only 45% of those with these symptoms reported having a positive test. This suggests a lack of testing in rural areas – either in terms of access to tests or health-seeking behaviour.

Section 1

Households with a family member that had tested positive for COVID-19 since January 2021 or had reported at least one of three COVID-19 symptoms in the past month (a total of 292 participants or 40%), were also asked questions on (1) access to medical care, (2) cost of care, and (3) money borrowed for treatment to understand the magnitude of COVID-19 related costs due to the potential impact on long-term livelihood security of households. Of these, 15% of households reported that they were unable to access medical treatment for COVID-19 when needed, with no significant difference across farm size. With regards to spending, 70% of these households reported spending money on COVID-19 treatment and 30% reported borrowing money for the same. Households spent an average of 24,596 INR (327 USD), with a standard deviation of 63,942 INR (849 USD). These values exclude one outlier that had reported 2,400,000 INR (31,876 USD). There was no variation by farm size on borrowing behaviour ($P=0.92$) or on amount borrowed ($P=0.41$). Only 6% of all interviewed households reported receiving medical supplies from the government, with no variation across farm size ($P=0.72$).

Sale of assets

A quarter (25%) of all respondents reported selling assets between January and July 2021 due to financial need, compared to only 14% reporting selling of assets between April and August of 2020, following the first nation-wide lockdown. Small and marginal farmers were more likely to have sold assets compared to large farmers ($P=0.05$), with livestock being the most-sold asset (40% of sales), followed by precious metals (31%). This differs from what the same respondents reported in 2020: metals were sold most often (59% of sales) as opposed to productive assets such as livestock (28%) (Pandey, 2021).

Food security

Food insecurity was measured using four questions. Three from the FAO's Food Insecurity Experience Scale: in the past month, was there a time when you or others in your household (1) worried you would run out of food, (2) skipped a meal, or (3) went without eating for a whole day (Ballard, Kepple *et al.*, 2013). A fourth question was added based on feedback from enumerators following the baseline survey: in the past month, was there a time when you or others in your household (4) ate less food.

In July-August 2021, 28% of agricultural households reported worrying about food, 17% reported eating less food, 6% reported skipping a meal, and 2% reported going without food for a whole day. Landless and small and marginal farmers were significantly more likely to report worrying about food ($P<0.001$) and eating less food ($P<0.001$) compared to large farmers, despite being more than three-times as likely to receive food rations ($P<0.001$).

Based on data from 420 households for whom data were available at all four time points, results indicate that agricultural households in India faced significantly more food insecurity in July-August 2021 compared to the same period in 2020, including higher rates of worrying about food ($P<0.001$), eating less food ($P<0.001$), and skipping a meal in the past month ($P=0.01$). Land-owning farmers reported higher food insecurity in July-August 2021 on all indicators compared to every other period during the pandemic.

Limitations

A sample size of 734 cannot be representative in a country as large as India. Phone-based interviews are likely to have resulted in the selection of more affluent farmers with access to a working phone connection. Telephonic interviews are also the reason our sample is predominantly male, given cultural norms discouraging women from speaking to unfamiliar enumerators. Given that participating farmers tended to be younger, male, with higher educational attainment and larger landholdings than average, our results may underestimate the real distress experienced by the average Indian agricultural household.

The recall period for survey questions ranged from one month for questions on food security and consumption, government support, and COVID-19 symptoms and up to six months for loss in income and sale of assets. The recall period may have impacted accurate reporting by participants. Results should be interpreted accordingly.

Discussion

Most agricultural households in India (75%) reported a decline in income in 2021 due to the COVID-19 pandemic. Our results are consistent with Oxfam India's report that 84% of Indians saw a decline in income in 2021 (Oxfam India, 2022). Data from the Centre for Sustainable Employment show that average household incomes saw a drastic fall during the lockdown period in April 2020, and again during the second wave in May 2021, without fully recovering to pre-pandemic levels by August of 2021 (CSE, 2022). It is possible that income of agricultural households also did not recover by July-August 2021 due to the seasonal nature of income from crop cultivation, as the harvest period of the primary crop in India is during September-November.

At the same time, 18% of households reported having a member who tested positive for COVID-19 in the first half of 2021. Nearly a third of households with a family member that had tested positive for COVID-19 or had symptoms, borrowed money for treatment – on average, 24,596 INR (327 USD), which is two and a half times the average monthly household income of 10,218 INR (136 USD) for agricultural households in 2018-19 (NSSO, 2021). A quarter of respondents reported selling assets, and it is a cause for worry that while non-productive assets were most frequently sold during the early stages of the pandemic, productive assets like livestock were most frequently sold during the second wave in 2021, limiting households' capacity to recover post-pandemic. This also indicates increased financial distress with the progression of the pandemic.

Small and marginal farmers were most likely to receive a cash transfer, and landless farmers were most likely to receive food rations, reflecting the fact that both types of subsidies target lower-income households. However, there was no significant relationship between households receiving any government support and selling of assets ($P=0.13$) or borrowing money for COVID-19 treatment ($P=0.67$). Receiving food rations was also not significantly related to the four food security indicators: worrying about food ($P=0.56$), eating less food ($P=0.07$), skipping a meal ($P=0.25$), or going a whole day without eating ($P=0.52$).

Households that reported a decrease in income due to COVID-19 were also significantly more likely to report worrying about food ($P<0.001$) and consuming less food ($P<0.001$). However, there was no correlation to household members testing positive for the virus and any of the food insecurity indicators. The income impact on food security was the most relevant, compared to the health impacts.

Financial distress of agricultural households caused by income loss may have been exacerbated due to COVID-19-related medical expenses, increased borrowing, and sale of assets. Government support, while targeted and most likely to reach potentially vulnerable groups, was not sufficient in mitigating higher economic distress or food insecurity. Post pandemic recovery in India must focus on increasing household income for agricultural households.

References

- Arasu, S. (2021). See how rural India has been overrun by the pandemic's second wave.
- Ballard, T.J., A.W. Kepple and C. Cafiero (2013). The food insecurity experience scale: development of a global standard for monitoring hunger worldwide. Rome, Food and Agriculture Organization.

Section 1

- Connors, K.J., Lindsay M; Prabhakaran, Poornima; Veluguri, Divya; Ramanjaneyulu, G.V.; Roy, Aditi; (2021). 'Impact of Crop Diversity on Dietary Diversity Among Farmers in India During the COVID-19 Pandemic.' *Frontiers in Sustainable Food Systems* 5(192).
- CSE. (2022). 'Covid-19 Employment and Income Tracker.' February 2022, from <https://cse.azimpremjiuniversity.edu.in/covid19-data-tracker/>.
- CSSE (2022). John Hopkins University CSSE COVID-19 Data.
- Drèze, J.S., A; (2021). The Covid-19 crisis and food security. Ideas for India.
- Government of India, O. o. t. R. G. C. C. (2011). Census. G. o. India. New Delhi.
- Jaacks, L.M., D. Veluguri, R. Serupally, A. Roy, P. Prabhakaran and G.V. Ramanjaneyulu (2021). 'Impact of the COVID-19 pandemic on agricultural production, livelihoods, and food security in India: baseline results of a phone survey.' *Food Secur*: 1-17.
- Kumar, S., M.E. Anwer, T. Immanuelraj, S. Kumar, H. Singh, S.N. Mishra and S. Sarkar (2020). 'Agricultural wages in India: trends and determinants.' *Agricultural Economics Research Review* 33(347-2020-1417): 71-79.
- Ministry of Agriculture & Farmers Welfare (2021). All India Report on Input Survey 2016-17. C. F. W. Department of Agriculture. New Delhi.
- Ministry of Agriculture & Farmers Welfare, G. o. I. (2020). All India Report on Agriculture Census 2015-16. New Delhi, Ministry of Agriculture & Farmers Welfare, Government of India.
- Ministry of Finance (2022). Statement on subsidies and subsidy related schemes.
- NSSO (2021). Situation Assessment of Agricultural Households and Land and Livestock Holdings of Households in Rural India 77th round. N. S. S. Organization. New Delhi.
- Oxfam India (2022). *Inequality Kills: India Supplement* Oxford, UK, Oxfam International.
- Pandey, N.V., Divya; Aditi Roy, Poornima Prabhakaran, Lindsay M. Jaacks (2021). 'Economic Impact of the 2020 COVID-19 lockdown on Indian farmers.' *Economic and political weekly* 56.
- Pandya, N.V., Divya; Roy, Aditi; Prabhakaran, Poornima; Jaacks M, Lindsay (2021). 'Economic Impact of the 2020 COVID-19 Lockdown on Indian Farmers.' *Economic and political weekly* 56(50).
- PLFS (2021). Periodic Labour Force Survey (January-March 2021). N. S. Office. New Delhi.
- The Hindu (2021). Share of new cases in rural/urban areas, The Hindu Data Team.

13. Food system resilience and governance: a pork story in China

J. Zhang^{1*}, L.X. Liu² and D. Tyfield¹

¹Lancaster Environment Centre, Lancaster University, Lancaster, LA1 4YQ, United Kingdom; ²Lancaster University Management School, Lancaster, LA1 4YX, United Kingdom; j.zhang54@lancaster.ac.uk

Abstract

Given the leading role of pork in China's meat diet, the stability of pork supply alongside the sustainability of pork production had been priorities in the pork system governance. The central government thus began the environmental protection campaign (EPC) of the pork system in 2014, aiming at optimising the regional layout of pig breeding and the producers' competence. However, such efforts have been interrupted and challenged by the outbreak of African swine fever (ASF) in 2018, with domestic pork yield falling sharply in 2019 and pork prices and imports soaring consequently. By applying an empirical and in-depth observational analysis with the driver-pressure-state-impact-response (DPSIR) model of these two significant events (EPC and ASF) in China's pork system, this paper examines how governance may influence food system resilience. This analysis demonstrates the crucial role of governance in China's pork system – as a pressure source for EPC by proactively facilitating systemic transformation or as partners with the pork industry to fight ASF shocks. The pork-related policy priorities have experienced a swing between environmental sustainability and production recovery, particularly as manifested in adjusting the regional layout of pig breeding. Advocacy and preferential policies for large-scale breeding have resulted in factual inequalities and accelerated the withdrawal of small producers from the pig production system. Public authorities' weighing of sustainability and resilience across different stages has also led to contrasting views on policy formulation and implementation. From the perspective of resilience, this paper illustrates that pursuing reorientation of the pork system during the EPC has undermined the systemic robustness to cope with the ASF, while dedicated policies on recovery have further compromised the original goals of systemic reorientation. By exploring the sharing of risks and benefits among multi-jurisdictional and multi-level policymakers, this paper explains the involvement of governance in building food system resilience and reveals the complex trade-offs among sustainability, resilience and several dimensions inside resilience, i.e. robustness, recovery and reorientation.

Keywords: environmental management, African swine fever, pork production, recovery, reorientation

Introduction

The activities of the food system are significant drivers of a variety of global environmental changes, while these changes may, in turn, interfere with the food system's function – to provide stable levels of consistent nutrition to the public (Springmann *et al.*, 2018; Gerten *et al.*, 2020; Tendall *et al.*, 2015). As one of the critical subsystems contributing to the overall environmental impacts of the food system, the livestock system provides the vast majority of meat for human consumption whilst also being severely threatened by crises arising from environmental changes. The foreseeable continuing growth of meat consumption has thus raised critical concerns about livestock production over its sustainability and resilience against disruptions (Henchion *et al.*, 2017).

Compared to sustainability which has been better studied, research on resilience has been rising in the food system related issues in recent years. While food system resilience is still a developing concept, the core is acknowledged as providing stable levels of consistent nutrition to the public despite disruptions (Tendall *et al.*, 2015). Animal diseases, supply chain breakdown, feed supply crisis and poor management on site may lead to fluctuations in livestock yields and marketing prices, thereby threatening the resilience

Section 1

of the livestock system. However, livestock systems' economic, social, and environmental pursuits at various levels are not fully aligned (Duru and Therond, 2015), in which systemic targets may even conflict with its actors' interests. Building resilience in the livestock system may thus vary considerably in spatial and temporal conditions. These illustrate the importance of the holistic strategy at the system level and the practical implementation at the actor level in building resilient livestock systems.

Therefore, this paper looks at one globally important case via an empirical and observational analysis of China's pork system. By applying the lens of food system resilience, this paper examines the process by which China's pork systems experienced crises, with particular focus on how governance has affected the actors of the pork system and the trade-offs between systemic resilience and sustainability.

Case background and method

The strong appetite of Chinese people for pork has made China both the top pork producer and consumer in the world. Regarding the regional layout, China's pig production was concentrated in key producing areas, as the top 13 provinces accounted for over 78.7% of the total yield in 2015 (National Bureau of Statistics, NBS). However, many traditional pork-producing provinces have a relatively fragile environmental capacity and are geographically far from the main producing areas of maize – one of the significant feed crops (Zhuo *et al.*, 2019). China's most economically developed and densely populated regions and megacities could hardly produce enough pork to meet their demand and thus rely heavily on importing pork from other provinces and abroad. At the local level, the distribution of pig farms has long been relatively decentralised, with numerous non-scale producers (annual pig slaughter of fewer than 500) providing 58% of the total yield in 2014 (NBS). Such a composition of pork yield has allowed for the repeated occurrence of the 'pig cycle' in China's pork system, in which small producers could be prone to swarm into or out of the market due to fluctuations in pork prices, resulting in cyclical variations in pork yield and prices. Non-scale producers are often less financially and technically equipped and therefore lack necessary waste treatment facilities for manure disposal, which risks contaminating the production site's water, air, and land.

With climate change intensifying globally, mitigating greenhouse gas emissions and environmental pollution from livestock production have become increasingly critical. Pig farms would preferably remain distant from residential areas due to the terrible odours and potential pollution, but the rapid urbanisation of east-central China has diminished available land. China's pork system faced long-term pressure on sustainability from the great contradictions between production and environment, while occasional shocks from animal diseases had caused dramatic fluctuations in pork yields and prices. Given that pork is the most significant single component of the CPI basket, the rapid rise in pork prices could threaten national inflation at the whole economic level (Funke *et al.*, 2015). All these constitute the drivers for the transformation of China's pork system towards a more sustainable and resilient orientation.

The reform of China's pork system requires cooperation in multi-jurisdictional and multi-level governance. At the central level, the Ministry of Agriculture and Rural Affairs (MARA) is directly responsible for national pork production, while other central departments, such as the Ministry of Ecology and Environment (MEE) and the Ministry of Natural Resources (MNR), provide regulatory or guiding policies to the pork system based on the requirements of the State Council and the concerns of their departments. However, the interests at the central level do not necessarily coincide with those of the provinces. The sharing and gaming of interests between the central government and provinces may affect policy implementations.

Given China's pork system background, the Driver-Pressure-State-Impact-Response (DPSIR) framework has been utilised to explore the disturbances in China's pork system and how governance has engaged with such pressures. We collect statistics and policy documents regarding China's pork system from 2014 to 2020 to apply to the DPSIR model.

Results

DPSIR-EPC

Since 2014, with environmental protection becoming a strong political will, the central government has begun the Environmental Protection Campaign (EPC) in the pork system intended to optimize the regional layout and the producers' structure and competence. The DPSIR-EPC analysis is shown in Figure 1. The drivers motivated the EPC that began in 2014 and manifested as Pressure-EPC on the pork system through policies from the central government promoting pollution management, encouraging scale breeding at pig farms, and relocating pig production layout as primary objectives. The State-EPC reflects what changes the Pressure-EPC has brought to the holistic environment of the pork system, while Impact-EPC demonstrates how these changes in the pork system have affected society. The Response-EPC involves the institutional efforts to address changes in the state.

The requirement for existing pig farms to establish qualified pollution treatment facilities has increased their operational costs and reduced the overall profits. However, pig breeding had apparent scale effects, with the costs diluting as the scale grows and the net profit of one pig subsequently increasing. The threshold imposed on coming farms for environmental assessment has further limited the entry of non-scale producers. Such policies intended to phase out scattered farms unable to meet environmental requirements or sustain losses and encouraged farms that remain financially and technically capable of transforming further or introducing more scale breeding. Consequently, the total number of pig farms in China fell by more than 8.8 million from 2015 to 2017, 94.6% of which are scattered farms with an annual pig slaughter of fewer than 50 (CVAHY, 2018). In contrast, there was a 55.9% increase in pig farms, with more than 50,000 pigs slaughtered per year. Despite the pains of transformation during the EPC, the pork system has reached its Phase-1 milestones and was progressing towards Phase-2 goals positively.

DPSIR-ASF

The outbreak of African swine fever (ASF) first occurred in August 2018 during adjusting regional pork production capacity and has heavily damaged China's pig production since then. Regarding the

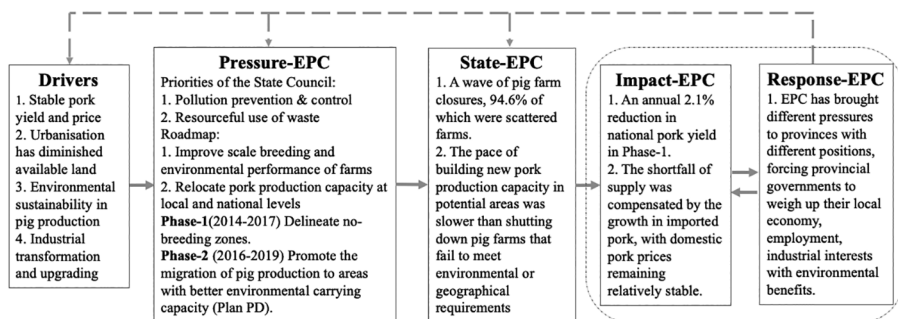


Figure 1. The DPSIR-EPC process from 2014 to 2017.

Section 1

State-ASF, the repeated outbreaks affected the sale of pigs and further diminished producers' ability and willingness to replenish piglets. The control and prevention of ASF have placed higher demands on the biosecurity protection and feed sources of pig farms, which pushed up the cost of breeding and made non-scale producers more challenging to sustain. China's pig stock and pork production thus fell sharply, with the pork prices doubling in the second half of 2019 (NBS). The central and local governments have, either actively or passively, responded by introducing a series of policies targeting production recovery. The DPSIR-ASF analysis is shown in Figure 2.

The State Council required immediate adjustments to no-breeding zones that exceeded the limits of laws, which proved some overreaches of policy implementation during EPC. In addition, the MEE and MARA have also relaxed the requirements for environmental assessment for pig farms, thus encouraging the building of new pig farms. Besides policy concessions on pig production on land use, electricity, financial taxes, *etc.*, the central government also rearranged the regional layout of pig production. Unlike the previous 'National Pig Production Development Plan 2016-2020' (Plan PD), which highlighted the environmental carrying capacity of each area, the 'Three-year Action Plan to Accelerate Recovery & Development of Pig Production' issued in 2019 (Plan RD) made certain adjustments on the roles of provinces according to their local production and consumption of pork. Some constrained zones changed to main supply zones, illustrating that the recovery of production capacity and securing supply, rather than improving the environmental performance, became the priority for the pork system under the attack of ASF. As the effects of policy responses unfolded, pigs in stock surged by 31% at the end of 2020. Pork yield rebounded strongly in 2021, rising by 28.8% over the previous year, a recovery of 98% of the 2018 level, which fulfilled the policy target highlighted in Plan RD.

Research implications

Unpacking the two DPSIR processes from a resilience perspective (Figure 3) couples this analysis with resilience theories (Ingram, 2017). The central government highlighted the transformation and upgrading of pork production towards an optimal functionality of the pork system – maintaining a basic level of pork self-sufficiency at a relatively moderate environmental cost. While this is intended to achieve a reorientation of China's pork system from a resilience lens, it has created unequal access to policy preferences among the various actors at an ethical dimension. Vulnerable small producers were put under more significant pressures to either exit or improve their environmental performance. However, in the process of reorientation, China's pork system has encountered the shock of ASF. As a result, the domestic pork yield fell considerably with the prices and imports soaring in 2019, undermining the robustness of China's pork system.

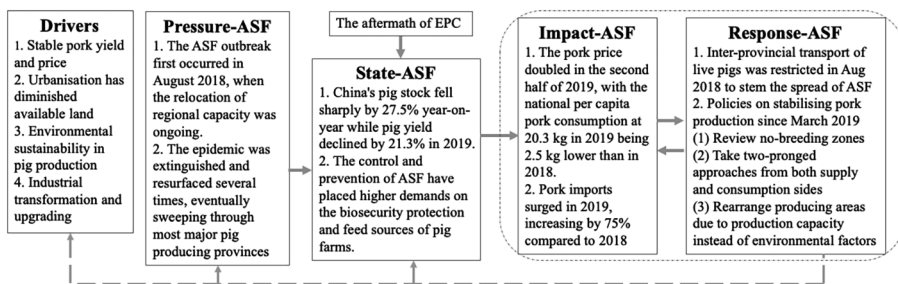


Figure 2. The DPSIR-ASF process from 2018 to 2020.

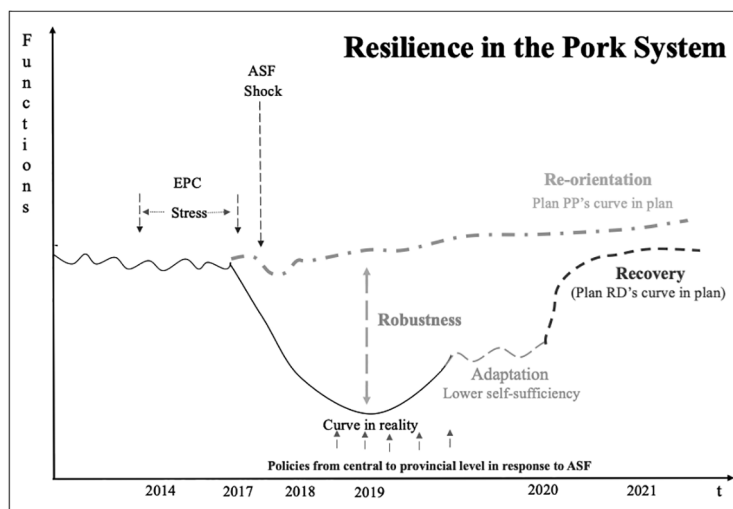


Figure 3. Explaining the two DPSIR processes via a resilience lens.

As the previous efforts aiming at the reorientation in EPC have affected producers at both the regional and local levels, the ASF shock accelerated the withdrawal of more vulnerable and less adaptable actors. Consequently, the pork supply shortage is emerging rapidly, but it takes a longer time to recover the pork production. In order to make up for the short-term lack of pork supply, the government has put in pork reserves, increased pork imports, and encouraged the consumption of substitute meat. Given that these adaptive policies have changed the previous optimal expectations of the pork system, we argue that such adaptations are not a core measurement of resilience capacity as it is more sort of a temporary expedient. For longer-term capacity recovery, the central government has proposed a range of policies along Plan RD. However, some of these policy objectives are not consistent with those previously introduced to achieve reorientation, indicating the complex trade-offs between sustainability, resilience, and several dimensions inside resilience.

This paper explores how governance may affect food system resilience, where public authorities can be a source of stress and a partner to manage shocks. This paper also sheds light on the ethical reflections that pursuing system-level resilience may lead to unequal effects on stratified actors.

References

- Duru, M. and Therond, O. (2015). Livestock system sustainability and resilience in intensive production zones: which form of ecological modernization? *Regional Environmental Change* 15: 1651-1665.
- Funke, M., Mehrotra, A. and Yu, H. (2015). Tracking Chinese CPI inflation in real time. *Empirical Economics* 48: 1619-1641.
- Gerten, D., Heck, V., Jaegermeyr, J., Bodirsky, B.L., Fetzer, I., Jalava, M., ... Schellnhuber, H.J. (2020). Feeding ten billion people is possible within four terrestrial planetary boundaries. *Nature Sustainability* 3: 200-+.
- Henchion, M., Hayes, M., Mullen, A.M., Fenelon, M. and Tiwari, B. (2017). Future protein supply and demand: strategies and factors influencing a sustainable equilibrium. *Foods* 6: 53.
- Ingram, J. (2017). Food system resilience. *Food Science and Technology* 31: 21-23.
- Springmann, M., Clark, M., Mason-D'croz, D., Wiebe, K., Bodirsky, B.L., Lassaletta, L., ... Willett, W. (2018). Options for keeping the food system within environmental limits. *Nature* 562: 519.

Section 1

- Tendall, D.M., Joerin, J., Kopainsky, B., Edwards, P., Shreck, A., Le, Q. B., . . . Six, J. (2015). Food system resilience: Defining the concept. *Global Food Security-Agriculture Policy Economics and Environment* 6: 17-23.
- Zhuo, L., Liu, Y., Yang, H., Hoekstra, A.Y., Liu, W., Cao, X., . . . Wu, P. (2019). Water for maize for pigs for pork: An analysis of inter-provincial trade in China. *Water research* 166: 115074.
- China Veterinary Animal Husbandry Yearbook (2018).
- National Bureau of Statistics (2022). Available at: <https://data.stats.gov.cn/>. Accessed 1 May 2021.

14. Organisational resilience and COVID lockdown: a multi-case study from restaurants in Wuhan, China

J. Zhang^{1*}, L.X. Liu² and D. Tyfield¹

¹Lancaster Environment Centre, Lancaster University, Lancaster, LA1 4YQ, United Kingdom; ²Lancaster University Management School, Lancaster, LA1 4YX, United Kingdom; j.zhang54@lancaster.ac.uk

Abstract

At the beginning of 2020, Wuhan was attacked by the outbreak of Covid-19 and experienced severe lockdowns lasting for 76 days. Along with its supply chains, the urban food system has survived COVID, but many businesses in the food system were significantly impacted, and the restaurant industry was among the most impacted ones with a 65.8% annual revenue reduction. In this study, we look into the organisational resilience of SMEs in the restaurant business. Nine semi-structured interviews were conducted one year after the lockdown was lifted, covering a wide range of restaurant types and scales. By examining the experiences of restaurants via the theoretical lens of dynamic capabilities, we focus on whether and how they sensed the threats and opportunities around the outbreak of Covid-19, seized opportunities by absorbing threats and adapting during and managed threats and transformed after the lockdown. The analysis highlights that reconfiguring resources to react rapidly has compensated for unpreparedness, which relies heavily on the operators' ability to access resources and collaborate with traditional and non-traditional supply chain actors. The cumulative effects of dynamic capabilities on organisational resilience at the sensing, seizing and transforming phase further underline the significance of keeping up and responding promptly to developments. However, inequality in access to resources has affected the dynamic capabilities of restaurants, with self-employed and independent restaurants tending to absorb the change and maintain the status quo, while restaurants with professional management are more willing to seize opportunities and transform. These findings reflect several worrying aspects around the recovery and transformation of China's urban restaurant sector in the post-Covid age. From an ethical view, the environment for independent restaurants has generally deteriorated, with prominent players gaining overwhelming advantages over small competitors in terms of capital resources, access to finance supports, advertising ability and technology accumulation. This paper contributes to resilience theories and managerial insights and sheds light on how the dynamic capabilities of restaurants have affected their organisational resilience, through which we also explore the implications of organisational resilience to achieve food system resilience.

Keywords: catering, dynamic capabilities, pandemic, lockdown, recovery

Introduction

The outbreak of Covid-19 exposed the vulnerabilities as well as the unpreparedness of the urban food system (Blay-Palmer *et al.*, 2021), and further highlights the significance of resilience of this system against various risks. The restaurant industry has the most intensive and unavoidable human contact in the urban food system and is therefore among the most impacted ones in the Covid context. The restaurant sector contributes to the urban food system particularly by supporting employment, generating economic income and tax revenue (Meneguel *et al.*, 2019), and perpetuating local dietary culture (Zhang *et al.*, 2021), thereby rendering its survival an essential aspect of the urban food system resilience. Recent studies revealed that the pandemic had brought business constraints and changes in consumption patterns to the restaurant industry (Kim *et al.*, 2021; Yang *et al.*, 2020). Lockdown and

Section 1

social restrictions forced many restaurants to shut down, with revenues plummeting and job losses (Brizek *et al.*, 2021, Kim *et al.*, 2021, Song *et al.*, 2021).

Wuhan was among the first major cities to be attacked by the outbreak of Covid-19 and experienced severe lockdowns lasting for 76 days (23rd Jan to 8th April 2020). Before the epidemic, Wuhan's catering industry had maintained steady growth in revenue and the number of branches in chain restaurants. However, Wuhan's GDP for 2020 decreased by 3%, while the total revenue from catering fell dramatically by 65.8%, with its contribution to GDP dropping from 4.67% to 1.66% (Figure 1). The shares of chain and above designated size restaurants in the total revenue of Wuhan's catering industry, which had remained stable before the epidemic, rose to 2.5 times the original levels in 2020. Amidst the wave of restaurant closures, the expansion of chain restaurants has shown a counter-trend growth. The epidemic has violently shaken Wuhan's catering industry, with large corporations and chains gaining significant advantages.

The experience regarding SARS indicated that changing customers' negative attitudes towards restaurants after the epidemic would be challenging because of customers' self-protection (Chuo, 2014). As the Covid-19 pandemic was far worse than SARS in terms of the number of cases and the spread of infection, restaurants that survive the initial shock must contemplate managing themselves and building resilience under the long-term pressures. This paper thus apply the theories of organisational resilience, which refers to the organisation's ability to withstand discontinuities in the system and adapt to new circumstances

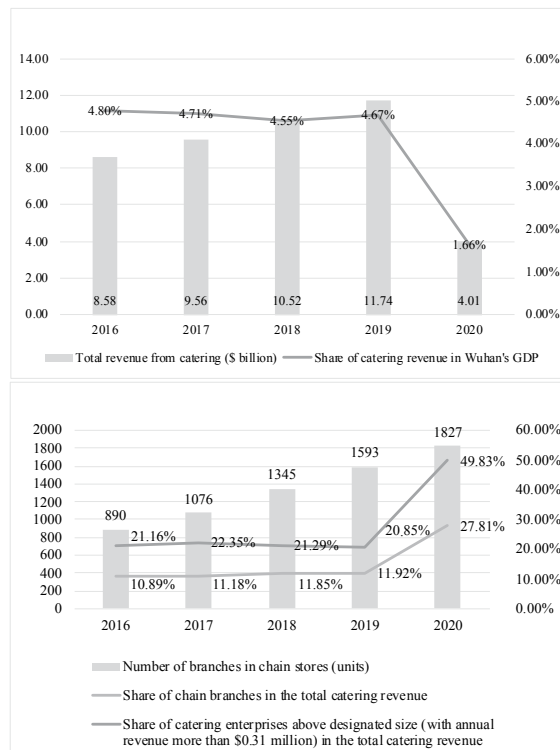


Figure 1. The development of the catering industry in Wuhan (Wuhan Statistical Yearbook 2017-2021, <https://tjj.hubei.gov.cn/tjsj/sjksxc/tjnj/gszjtj/whs/>).

(Starr *et al.*, 2003), and dynamic capabilities, which are based on reconfiguring internal and external resources, modifying routine operations, and transforming knowledge (Cepeda and Vera, 2007), as the theoretical lenses. Through conducting interviews with restaurant operators in Wuhan, this study examines how catering organisations’ dynamic capabilities including sensing, seizing and transforming (Teece, 2007, 2017) in response to the Covid-19 affect organisational resilience (Figure 2), through which we also explore the implications of organisational resilience for urban food system resilience.

Material and methods

Given the explorative nature of the research, a multi-case study approach was adopted to enable an in-depth investigation of the phenomenon of interest (Voss *et al.*, 2002; Hendry *et al.*, 2019). This research designed interviews focusing on three main categories of questions– each of which was investigated for the individual organisation: (1) the routine operation and supply chain relationships, (2) the experiences during the lockdown and (3) the transformation and organisational performance after the lockdown.

In selecting research participants, given disparities in the experiences and the recovery of restaurants in different types (Yang *et al.*, 2020, Perez *et al.*, 2021), we chose restaurants with diversified characters in terms of affiliation, scale & size, operated years and location. In total, nine case studies have been included. Table 1 provides a list of these organisations with their simplified basic information and indicates the mnemonics used hereafter to refer to the data for the nine individual interviewees.

The interviews were conducted between May to September 2021 – one year after Wuhan’s lockdown being lifted. The interviews were semi-structured, allowing the interviewees to express themselves freely and provide additional information as appropriate. The length of each interview ranges from 40 to 90 minutes. Data from interviews have been coded and interpreted using the dynamic capabilities perspective, covering sensing, seizing, and transforming stages.

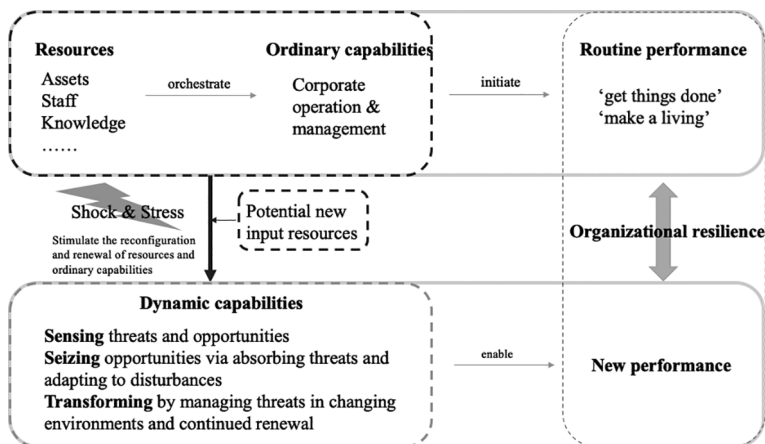


Figure 2. Research model: linking organisational capabilities, performances and resilience.

Section 1

Table 1. The basic information of the interviewees.

Mnemonics	R1	R2	R3	R4	R5	R6	R7	R8	R9
Cuisine style	Grill & barbecue	Group catering	Chinese cuisines	Halal food	Chinese cuisines	Chinese cuisines	Chinese fast food	Banquet	Business and private dinner
Years operated	3	2	17	25	2	14	3	15	3
Number of employees	150+ (in 11 chain branches)	10+ (in 2 branches)	22	30+ (in 2 chain branches)	20	40-50	10	100+ (in one of 2 chain branches)	48 (in one of 27 chain branches)
Price per person (RMB)	60	15	70	80	55	160	50	80	100+
Interviewee	Founder, shareholder, manager	Owner	Owner	Owner	Owner	Shareholder and manager	Owner	Manager	Manager

Results

Our findings suggest that an essential source of the performance gap for organisational resilience is whether and how well they exploit their dynamic capabilities. Such process includes the reconfiguration of resources and the modification of ordinary capabilities. The main results have been displayed in Table 2. All three stages are considered critical components of the organisational resilience process.

The epidemic has driven restaurants to look at themselves, discover and refine their true identity and explore the path forward. In comparison, R1, R2, R8 and R9 are more resourceful and capable of transformation with experienced operators and disciplined internal management. The younger, self-employed R5 and R7 are also willing to transform. R3 and R4 have been in operation for over 20 years, but their older owners prefer to keep their business as usual. R6 suffered severe losses during the epidemic as it failed to spend its stock. R6 is still struggling to recover after reopening despite suffering from the shrinkage of its original business and has made no move to transform itself.

Research implications

The empirical analysis of restaurants' responses to Covid-19 provides organisations insights on enhancing their dynamic capabilities and resilience. Our interviewees all survived and thus are all 'resilient' in a way, but how resilient they are depends on how these organisations access resources and apply their dynamic capabilities. Food inventories can also serve as buffer resources that allow the organisation to remain operational under challenging times from the resilience perspective. However, delays in response and action can occur at almost every phase of a restaurant's application of dynamic capabilities. The boundary between resource buffers and waste is also variable. Once an organisation fails to seize the opportunity to utilise buffer resources, those food inventories may become a burden. Serving group catering during the lockdown delivered co-benefits at both the organisational and system-level resilience. In general, self-employed restaurants tend to absorb the change and maintain business as usual, while those operated and managed professionally are more willing and able to seize opportunities and transform their business models and products.

Table 2. The summary of main results.

Dynamic capabilities	Sample performance from the evidence	
Sensing (around the outbreak)	Threats	<ol style="list-style-type: none"> 1. The unguaranteed supply chain during Chinese New Year (R1, R2, R4, R6, R8) 2. An infectious disease (R7, R8)
	Opportunities	<ol style="list-style-type: none"> 1. Serving group catering to people in need (R4, R5, R6, R8, R9)
Seizing (during the lockdown)	Absorbing threats	<ol style="list-style-type: none"> 1. Losses on rent owing to the nature of landlord (public-R2, R5, R7; private-R1, R3, R4, R6, R8, R9) 2. The payment of staff wages when not operating normally (no pay-R5, R7, reduced pay-R1, R3, R4, R6, R9; regular pay-R8)
	Adapting to the lockdown	<ol style="list-style-type: none"> 1. Serving group catering (R2, R4, R8, R9) 2. Expanding sales and spending the food stock via several channels (R1, R7, R8) 3. No actions (hesitation resulting in huge losses-R6)
Transforming (after the lockdown)	Managing threats and transforming	<ol style="list-style-type: none"> 1. Fewer consumers: extending products and services to where the customers are (transforming business model-R3, R9; selling dishes and semi-finished products via contactless ways-R1, R8, R9; delivering services to customers-R9) 2. Labour issues (redundancies-R3, R7, R8; recruitment difficulties-R1, R9) 3. Other operational cost (rising prices of food ingredients-R2, R3, R4, R6, R8; cutting operating costs-R3, R5, R7)

At the system level, China’s urban restaurant sector has been transforming towards industrialization, mainly in terms of: (1) the normalization of management and operation driven by chains and branded restaurants; and (2) the trend of (1) and the growth of takeaways further promoting the standardization of products. Although the industrialisation of the restaurant industry has left room for a diverse range of restaurants that the products and services offered still retain numerous customised features far from being fully standardised, the diversity and equity of the restaurant sector are still concerning from an ethical perspective. Branded restaurants have gained overwhelming advantages over independent competitors in capital resources, access to finance supports, and advertising ability. The technological colonisation of small businesses by prominent players through exporting semi-finished products might stifle their creativity and knowledge accumulation, while the abuse of semi-finished products may further domesticate consumers, thus imperilling the diversity of food culture and leaving traditional dining in a challenging future.

References

Blay-Palmer, A., Santini, G., Halliday, J., Malec, R., Carey, J., Keller, L., . . . Van Veenhuizen, R. (2021). City Region Food Systems: Building Resilience to COVID-19 and Other Shocks. *Sustainability* 13: 1303-1325.

Brizek, M.G., Frash, R.E., Mcleod, B.M. and Patience, M.O. (2021). Independent restaurant operator perspectives in the wake of the COVID-19 pandemic. *International Journal of Hospitality Management* 93.

Cepeda, G. and Vera, D. (2007). Dynamic capabilities and operational capabilities: A knowledge management perspective. *Journal of Business Research* 60: 426-437.

Chuo, H.Y. (2014). Restaurant diners’ self-protective behavior in response to an epidemic crisis. *International Journal of Hospitality Management* 38: 74-83.

https://www.wageningenacademic.com/doi/book/10.3920/0978-90-8686-939-8 - Wednesday, December 14, 2022 7:49:12 AM - IP Address:185.128.124.75

Section 1

- Hendry, L.C., Stevenson, M., Macbryde, J., Ball, P., Sayed, M. and Liu, L.X. (2019). Local food supply chain resilience to constitutional change: the Brexit effect. *International Journal of Operations & Production Management* 39: 429-453.
- Kim, J., Kim, J. and Wang, Y.Q. (2021). Uncertainty risks and strategic reaction of restaurant firms amid COVID-19: Evidence from China. *International Journal of Hospitality Management* 92.
- Meneguel, C.R.D., Mundet, L. and Aulet, S. (2019). The role of a high-quality restaurant in stimulating the creation and development of gastronomy tourism. *International Journal of Hospitality Management* 83: 220-228.
- Perez, V., Aybar, C. and Pavia, J.M. (2021). COVID-19 and Changes in Social Habits. *Restaurant Terraces, a Booming Space in Cities. The Case of Madrid. Mathematics* 9.
- Song, H.J., Yeon, J. and Lee, S. (2021). Impact of the COVID-19 pandemic: Evidence from the US restaurant industry. *International Journal of Hospitality Management* 92.
- Starr, R., Newfrock, J. and Delurey, M. (2003). Enterprise resilience: managing risk in the networked economy. *Strategy and business* 30: 70-79.
- Teece, D.J. (2007). Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal* 28: 1319-1350.
- Teece, D.J. (2017). Towards a capability theory of (innovating) firms: implications for management and policy. *Cambridge Journal of Economics* 41: 693-720.
- Voss, C., Tsikriktsis, N. and Frohlich, M. (2002). Case research in operations management. *International Journal of Operations & Production Management* 22: 195-219.
- Yang, Y., Liu, H. B. and Chen, X. (2020). COVID-19 and restaurant demand: early effects of the pandemic and stay-at-home orders. *International Journal of Contemporary Hospitality Management* 13: 3809-3834.
- Zhang, H., Zhou, X., Tang, G., Xiong, L. and Dong, K. (2021). Mining spatial patterns of food culture in China using restaurant POI data. *Transactions in GIS* 25: 579-601.

Section 2.

Land and wild places

15. On the forms of harm stemming from the instrumentalization of large-scale ecosystems

S.I. Espinosa Flor

University of Vienna, Universitätsstraße 7, 1010 Vienna, Austria; sarah.espinosa@univie.ac.at

Abstract

One could argue that the use, extraction, and development of natural resources for human purposes, i.e. resource exploitation, constitutes a form of instrumentalization of the ecosystems from which these resources are derived. Moreover, that such instrumentalization may be carried out in a way that has adverse social and environmental impacts. Given that a number of ecosystems are indispensable for the satisfaction of human interests and needs, their instrumentalization may nevertheless be justified. In this context, if the amount and rate of instrumentalization of ecosystems leads to their depletion, people whose well-being depends on the ecosystems' existence may be profoundly harmed. Those instrumentalization practices and actions that lead to states of depletion are generally considered as harmful, but only to those whose interests and needs are frustrated as a result of such practices and actions. In this paper, I argue that the way in which ecosystems are instrumentalized, and not just the quantity and rate, may also cause a philosophically relevant form of harm, and not necessarily to humans: A given ecosystem may be meaningfully harmed not only when it is depleted, but also when its functioning is altered in such a way that it cannot retain core capacities it had before it was instrumentalized.

Keywords: resource exploitation, natural resources, commons, extractivism, integrity

Harm and instrumentalization

Broadly, resource exploitation refers to the use, extraction, and development of 'non-human nature' as a means to achieve human ends (Blackburn, 2016). Resource exploitation can thus be understood as the instrumentalization of non-human nature by human beings in pursuit of certain purposes, such as the fulfilment of their vital needs. Following this definition, a broad concept of non-human nature (however defined) makes it possible to indicate the origin of all goods and services, i.e. natural resources, available for human purposes (whether justified or not). Yet, if one considers concrete cases of resource exploitation, such a concept seems to be insufficient to indicate what is actually being instrumentalized and whether practices or actions of this kind can be of philosophical interest. For instance, when water is extracted from an underwater reservoir, it is 'the system' that constitutes the reservoir from which the water flows that is being instrumented, not 'non-human nature' as a whole.

In this sense, so-called natural resources can be said to derive from ecosystems that, given their particular characteristics, can provide humans with the means to achieve certain ends (Walker and Salt, 2012). If this premise can be reasonably sustained, one could argue the following: Resource exploitation refers to the instrumentalization of ecosystems, from which natural resources flow. I shall go a step further and argue that resource exploitation can be meaningfully understood as the harmful instrumentalization of the ecosystems from which these resources flow. I shall elaborate on this. First of all, it should be clarified that although the use, extraction and development of resources may be reasonably defined as the instrumentalization of the ecosystems from which these resources flow, resource exploitation does not manifest itself through any type of instrumentalization practices and actions, but only through those

Section 2

that can be qualified as harmful. This is because the way of instrumentalizing an ecosystem may produce different consequences in each case, both for those who instrumentalize and for the instrumentalized.

For example, if a rainforest providing with vital resources is instrumentalized in such a way that its trees cannot grow or resprout over time, the rainforest and those who depend on it will be affected differently than if the rainforest had not been instrumentalized in that way or instrumentalized at all. Although in different ways, both the instrumentalizer and the instrumentalized are affected. Either because access to the rainforest is difficult to restrict or because its capacity to provide resources to humans is limited, instrumentalization actions and practices to it need not have a negative impact on it and on those who carry them out. Drawing on common-pool resources literature (e.g. Gibson *et al.*, 2000), one could think of ways of instrumentalizing the rainforest, for example, by managing it in such a way that the trees that compose it can grow, resprout, and generally sustain themselves over time while the communities of users of this rainforest benefit from it. From this perspective, I examine the extent to which resource exploitation amounts only to those harmful instrumentalization practices and actions to the ecosystems.

Given the relational nature of ecosystems, however, this is not the only form of harm that may result from resource exploitation. Consequently, the purpose of this paper is to provide a brief theoretical picture of two forms of harm that could arise from resource exploitation, one in relation to the ecosystems themselves (observable harm) and the other in relation to the would-be instrumentalizers of the ecosystems (perceivable harm). According to the literature on social harm (e.g. Yar, 2012; Pemberton, 2016), a state of harm is usually validated or discarded according to the empirical knowledge of those who have the capacity to perceive it. Hence, one might be tempted to say that only those who have this capacity can directly be harmed. Against this idea, I shall analyse some of the conditions required for being in a harmed state and, therefore, who and what can properly be considered as the harmed subjects of resource exploitation.

I begin by providing some influential definitions of harm that can be put to the test in the context of resource exploitation and, in the following sections, provide an analysis of the perceivable and observable harm that can be said result from said practices and actions. Legal philosopher Feinberg (1987) gives a well-known account of harm by differentiating between a non-normative and a normative notion, the former defined as a setback of individuals' interests and the latter as wrongs. His own notion, as he considers it relevant to justify state coercion over the liberty of the individual, combines both notions (Feinberg, 1987, Ch. 3). He further distinguishes 'welfare interests', which are those necessary and minimum for the attainment of a well-being, from 'ulterior interests', which are rather interests related to one's own personal projects and goals. Well-being understood as the 'advancement' of ulterior interests provided that welfare interests are met to a minimum degree, e.g. when there is no incapacitating suffering (Feinberg, 1987, 51).

According to him, although nonhuman animals can be said to possess welfare interests, only humans can be said to pursue their fulfilment in order to advance their ulterior interests (Ibid., 59). In other words, to the extent that welfare interests set the basis for the advancement of ulterior interests, only humans can be indefensibly (unjustifiably and inexcusably) thwarted and also wronged in their ulterior interests. Nevertheless, animals can also be indefensibly thwarted in their interest to achieve those conditions that are indispensable for their welfare. Non-living entities or 'mere things' can shatter or split and others at best be broken. Entities that have some function in a wider context may cease to work, and even complex assemblages composed of living organisms may be impaired when one of these components is crucially altered so that they can no longer behave as they normally would.

In general, though, all things in which no person has an interest or in which no person has a derivative interest at most, cannot properly be said to be harmed. In a less legal vein, others have opted for a more

open and deliberative definition of harm, i.e. they present this concept as a work in progress (Hillyard and Tombs, 2004). Similarly, other scholars argue that harm can be regarded as a 'reflection of relations, processes, flows, practices, discourse, actions and inactions that constitute the fabric of our societies which serve to compromise the fulfilment of human needs' (Pemberton, 2016, 24). Although the latter notion may be more encompassing in relation to unmet needs, the harmed subject as a site of philosophical inquiry is still relegated to the interpersonal and social sphere. Hence, if the definition of harm is to be taken as a work in progress, there is room to inquire whether entities such as ecosystems can be directly harmed when instrumentalized.

Exploitation and perceivable harm

Perceivable harm can be considered as the form of harm experienced by the injured party. However, not everything that is experienced with displeasure, resentment, or discomfort can qualify as perceivable harm, as it would then have to include innumerable states, rendering the philosophical relevance of harm a mere matter of definition. For example, if an earthquake causes you a physical injury, it will probably hurt, but you will not perceive this injury as a harm done to you. Similarly, if you do not like a specific type of food and eat it, you will probably feel aversion towards it, though it you will probably not describe this experience as harmful. Accordingly, there have to be something that differentiate perceptible harm from other injuries. I shall call these the 'severity' and the 'controllability' conditions of harm.

Regarding the severity of harm, Feinberg (1987) points out that what is significant is not only the particularities of each sensory experience, both physical and mental involving injuries, offenses, or other forms of discomfort, but the general contrast that all of them have with the states of harm. To be harmed (and wronged), you have to be indefensibly 'stripped of' something you value. Though not everything that is valuable is such that its absence is harmful; just as not everything that is undesirable is such that its presence is harmful. An undesirable thing is harmful only when its presence is sufficient to impede an interest (Feinberg, 1987, 48); be it a welfare interest or an ulterior one. Thus, harmful practices and actions come to be defined as are those that infringe on something that can be considered a legitimate interest, whether one chooses to see it in the form of individual needs, goals, or even social conditions.

Regarding the controllability of harm, a distinction can be made between harms caused directly between individuals or harms framed in a broader context. As for interpersonal harm, one option may be to describe it in terms of intentionality, emphasizing individual agency in harming. For broader, or social forms of harm, one option may be to describe it in terms of preventability, emphasizing not necessarily individual agency in causing harm, but intervention to prevent it (e.g. Yar, 2012). Moreover, the consequences of harmful practices and actions, whether towards individuals or collectives, have to be (to some extent) foreseeable (Presser, 2013; Plant, 1998). Returning to the previous example of the rainforest providing human beings with vital resources, one could say that those actions and practices of instrumentalization of this forest that intentionally or foreseeably endanger the provision of these resources are likely to cause perceptible harm to human beings.

Whether one chooses to explain harm in terms of reversal of welfare interests or unmet needs, it seems rather unproblematic to say that those practices and actions which endanger a sentient being's livelihood, can be considered as harmful. Moreover, if it can be argued that a minimum threshold of well-being for human beings, and at least for other sentient beings, can be understood as the absence of incapacitating suffering (Feinberg, 1987, 51), then the non-fulfilment of certain needs could be conceived as instances of harm. Seen in another way, reaching a minimum threshold of well-being would allow the possibility of prospering or, otherwise, languishing. Consequently, when the possibility for humans and other living beings to flourish is restricted by actions and practices that are intentional, preventable, and foreseeable, and such actions and practices compromise their well-being, a harm is caused (cf. Schwendingers, 1970).

Section 2

Expanding on this idea, one could argue that every entity – of which it makes sense to say that it has the possibility to flourish – could also be susceptible to harm. Thus, practices and actions that compromise an entity's possibility of flourishing could also qualify as harmful. In what follows, I point out some arguments as to why and to what extent, it may make sense to say that ecosystems have a potential to flourish and are therefore prone to be appropriately harmed. Provided that a situation is possible in which the instrumentalization of certain ecosystems contributes to the provision of a minimum threshold of well-being for human beings but does not result in damage to these ecosystems, it will be possible to distinguish resource exploitation or harmful instrumentalization from non-harmful or 'sustainable' instrumentalization.

Exploitation and observable harm

Building on the definitions of harm outlined so far, in this section I examine the extent to which the exploitation of resources amounts to harmful instrumentalization of the ecosystem from which these resources flow. In general, the instrumentalization of an ecosystem is considered to be of philosophical relevance when it results in the depletion of the resources that the ecosystem provides. As noted above, this is most prominent when the ecosystem in question cannot longer provide humans with the resources that are vital to them. In relation to so-called renewable resources, depletion means using, extracting, or developing resources in quantities and at a rate that threatens the very existence of the ecosystem that provides them. However, it is possible to think of situations in which an ecosystem continues to exist, even providing humans with vital resources, but having undergone harms that can be made evident. In this section, I suggest that not only the quantity of instrumentalization, but the quality of it, can be harmful to ecosystems.

So far, I have distinguished states of harm from other states of discomfort by providing with the severity and controllability conditions. Accordingly, harm is not only a momentary sting caused by one person to another but according to some, occupies 'the most serious forms of social practice' (Lasslett, 2010, 13). One could argue that these states, however, are not limited to states experienced by human beings. In other words, the perception of suffering and pain may be sufficient indicators of the absence of a minimum threshold of well-being in the case of sentient beings, both human and non-human. Even in relation to sentient beings in general, one could argue that there are situations in which perception is not necessary for harm to occur. For example, someone can be under the influence of some narcotic drug and be unarguably the victim of physical or psychophysical harm. Assuming that this person values their physical and psychological health as an essential element in their ability to lead a flourishing life, the lack thereof implies a harm to this person. This is regardless of whether they are in pain or not.

Hence, there are those who consider that harm refers to the restriction of the potential for flourishing through actions, practices or relationships that are identifiable (Pemberton, 2016, 18). As noted above, it is often thought that non-human entities or 'mere things' cannot be harmed directly, but in an extended or derivative way. For example, if my phone breaks, there is no setback in any interest in the existence of the phone itself, but a setback in my interest in communicating through it, hence the harm. The same would be true for more complex things, for example, computers: If a component of a computer is fundamentally altered, it is likely that the computer will stop functioning as it normally would and therefore be labelled as 'damaged' not as being harmed. If, nevertheless, the necessary conditions of harm are severity and controllability and, on the part of the one who is subject to it, the possibility of flourishing, the notion of harm may be extended to some of the more complex 'functioning wholes.'

Within the field of ecology, collective non-human entities such as ecosystems can be described as consisting of living and non-living components, which interact to form a 'stable system' (Tansley,

1935). Ecosystems are often characterized by being dynamic, complex, and functional systems, which have the capacity e.g. to evolve and sustain themselves through different forms of life, relationships, and interactions with their environment (see Odum, 1994). From this perspective, ecosystems can be understood as complex, relational and collective 'entities' that are dependent on their components and can cease of functioning. Still, this does not mean that they have a possibility to flourish and languish. One could think that the possibility of collective entities, such as colonies, herds and also ecosystems, to flourish is reducible to that of the individual beings that compose them, so that reasoning about their flourishing is reducible to reasoning about the flourishing of individual beings.

Underlying this premise is that the capacity for something to flourish is attributable only to those entities that have a life of their own. Hence, if collective entities lack characteristics such as reproduction, growth, and death, they cannot flourish. In this respect, authors such as O'Neill (1992) have argued that even if it does not make sense to say that collective entities have life in a literal sense, it does make sense to speak of their life in a metaphorical sense. Such an attribution of 'life' is sufficient to speak of that which is good of these entities and thus of the conditions necessary for them to flourish and be impaired in a non-metaphorical sense. For instance, it makes sense to speak of what is good of a corporation, given the kind of entity it is, without reducing its 'welfare' to that of their members (O'Neill, 1992, 130). In the same way, it makes sense to talk about what is good in an ecosystem and, therefore, about what constitutes a state of well-being for it. In the same way, it makes sense to speak of what is good in an ecosystem and, therefore, of what could constitute a state of 'welfare' to it.

In this sense, it may be possible to identify the conditions under which a given ecosystem, given its characteristics, functioning and capabilities, can flourish, and thus the conditions under which it cannot. In the case of a given ecosystem, as in the case of any other living thing, it seems uncontroversial to say that practices and actions that cause its death or cessation of existence constitute a clear impediment to its ability to flourish and can therefore be considered as harmful; depletion of the ecosystem marks this point. Though, an ecosystem may still be 'alive', may even continue to provide resources to humans, and yet not function as it did before being instrumentalized as the type of ecosystem it was. More specifically, if an ecosystem is intentionally and controllably instrumentalized and that instrumentalization results in the ecosystem's inability to return to functioning, after the instrumentalization, substantially as the same type of system it was before the instrumentalization – disrupting its loose integrity (Crescenzo, 2013) –, the ecosystem can be qualified as directly harmed.

If the rainforest trees mentioned throughout this paper are harvested in such a way that the forest cannot retain its ability to function at a minimum level above which it makes sense to say that it can flourish, even if the forest is not depleted, it makes sense to say that the forest has been harmed. To the extent that this state is observable or identifiable, the practices and actions that give rise to it may be preventable. Indeed, even if states of harm are not identified at the time they occur, the consequences of certain instrumentalization actions and practices could be foreseen and thus prevented. For example, through instrumentalization practices and actions that have proven to be harmful in the past. One possibility to infer the consequences of instrumentalization actions and practices to prevent those that are harmful could be, theoretically at least, to establish a criterion to determine the functioning and capacities of an ecosystem and, according to that criterion, collect information on whether or not ecosystems have been harmed.

In this sense, modifying the conditions that give rise to observable harm to ecosystems, and not only to humans, could potentially translate into measures to prevent it. In short, to the extent that it is possible to foresee the harm resulting from resource exploitation, it may be possible to consider a way of relating to certain ecosystems, especially those that provide vital resources to humans, that is not harmful to them.

Conclusions

Resource exploitation can be considered harmful to humans and other living beings insofar as it jeopardizes a minimum threshold for their well-being. Resource exploitation is not always regarded as such with respect to the ecosystems from which those resources flow. Since the use of and access to certain ecosystems is usually justified on the basis of human interests and needs, only instrumentalization practices and actions that destroy ecosystems are considered harmful. Yet, the disruption of the loose integrity of an ecosystem could also qualify as harmful, even if the ecosystem is not yet depleted. In this paper I have discussed two concepts of harm and have argued, firstly, that ecosystems can be directly harmed and, secondly, that while depleting them is harmful, especially to those who depend on them, resource exploitation can already qualify as such, namely to the ecosystems themselves. It is therefore not only the quantity in which an ecosystem is instrumentalized that can be harmful, but the quality in which it is carried out. From there, the conditions of observable harm caused to ecosystems by certain practices and actions of instrumentalization could be further explored.

References

- Blackburn, S. (2016). Exploitation. In *The Oxford Dictionary of Philosophy*. Oxford University Press.
- Odum, H.T. (1994) *Ecological and General Systems: An Introduction to Systems Ecology*. University Press of Colorado.
- Crescenzo, D. L. (2013). Loose integrity and ecosystem justice on Nussbaum's capabilities approach. *Environmental Philosophy*, 10(2), 53-73.
- Feinberg, J. (1987). *Harm to others* (Vol. 1). Oxford University Press.
- Gibson, C.C. McKean M.A. and Ostrom, E. (2000). *People and forests: communities, institutions, and governance*. MIT Press.
- Hillyard, P. and Tombs, S. (2004). Beyond criminology? in P. Hillyard, C. Pantazis, S. Tombs and D. Gordon (eds) *Beyond criminology: Taking harm seriously*, London: Pluto Press, Chapter 2.
- Lasslett, K. (2010). Crime or social harm? A dialectical perspective, *Crime, Law and Social Change*, vol 54, no 1, pp 1-19.
- Pemberton, S. A. (2016). *Harmful societies: Understanding social harm*. Policy Press.
- Plant, R. (1998). Citizenship, rights, welfare, in J. Franklin (ed) *Social policy and social justice*, London: Institute for Public Policy Research, pp 57-72.
- Presser, L. (2013) *Why we harm*, New Brunswick, NJ: Rutgers University Press.
- Schwendinger, H. and Schwendinger, J. (1970). Defenders of order or guardians of human rights, *Issues in Criminology*, vol 5, no 2, pp 123-57.
- Tansley, A. G. (1935). The use and abuse of vegetational concepts and terms. *Ecology*, 16(3), 284-307.
- Walker, B. and Salt, D. (2012). *Resilience thinking: Sustaining ecosystems and people in a changing world*. Island press.
- Yar, M. (2012). Critical criminology, critical theory, and social harm, in S. Hall and S. Winlow (eds) *New directions in criminological theory*, Abingdon: Routledge, pp 52-65.

16. Using domesticated animals in rewilding projects: what does the public think?

C. Gamborg^{1*}, F.S. Jensen² and P. Sandøe^{1,3}

¹Department of Food and Resource Economics, University of Copenhagen, Rolighedsvej 23, 1958 Frederiksberg C, Denmark; ²Department of Geosciences and Natural Resource Management, University of Copenhagen, Rolighedsvej 23, 1958 Frederiksberg C, Denmark; ³Department of Veterinary and Animal Sciences, University of Copenhagen, Grønnegårdsvej 8, 1870 Frederiksberg C, Denmark; chg@ifro.ku.dk

Abstract

Over recent years, rewilding has enjoyed growing traction in restoration ecology and it now receives considerable public exposure. The concept of rewilding has been around since the 1990s. Essentially, it involves retrieving so-called ‘missing’, or ‘dysfunctional’, ecological processes, i.e. ‘restarting’ them, with the goal of creating better habitats and obtaining more species diversity. In this paper, we will focus on a specific form of rewilding, known as ‘translocation rewilding’, in the Danish context. In this kind of rewilding, domesticated larger grazing animals such as horses and cattle are settled in National Nature Parks with an area of 5–30 km² to facilitate the improvements to the ecosystem just mentioned. In some cases, the animal populations will hold male and female animals and will be allowed to reproduce naturally. This way of managing nature is controversial, not only in Denmark but also, for example, in the Netherlands. A key question is how the animals released into the area should be regarded, and treated, over time: Are they domestic or wild animals? Will the public buy into the idea that the animals should fend for themselves, or will they think that they should remain domestic animals in human care, only differing from other domestic animals in the special benefits they provide? This paper aims to develop a better understanding of these questions, and of where the public stand on them. We present an empirically informed ethical analysis. The data were obtained in a nationally representative survey conducted in Denmark in the spring of 2022. The questionnaire contained one section on general attitudes to nature and wild animals, one on National Nature Parks, and another specifically on animal management and welfare. Best-Worst scaling was applied to data from the last two of these sections to elicit public priorities. Our aim was to identify, categorise and characterise the values at play. We anticipated that we would observe three clusters of these relating to nature, animals, and humans, and that the clusters would contain, as salient parts, naturalness, wildness, animal welfare, and human access and safety. So far, discussions of translocation rewilding within the scientific community and civil society have been polarised. We emphasise the need for a more clear and transparent discussion of what people care about and how they think potentially conflicting concerns should be balanced.

Keywords: animal welfare, biodiversity, naturalness, safety

Introduction

The very idea of nature is associated with deeply embedded, mostly positive, values, and animals often evoke strong emotions, either positive (e.g. awe) or negative (e.g. fear). When plans are made to fence off parts of nature and put domesticated animals inside the fenced areas for the sake of biodiversity, the issue inevitably becomes explosive (Dempsey, 2021). A case in point is the controversial rewilding experiment in Oostvaardersplassen in the Netherlands (Kopnina *et al.*, 2019).

The concept of rewilding has been in circulation since the 1990s, but it is only in recent years that rewilding projects have begun to take off. The UN has declared the decade 2020–2029 the ‘United

Section 2

Nations Decade for the Restoration of Ecosystems'. Interest is growing within the scientific field of restoration ecology, as well as among nature and wildlife managers, environmental NGOs and politicians, in many other places in Europe and indeed around the world (Gordon *et al.*, 2021).

Rewilding is not nature restoration in the traditional sense, where one seeks to restore the previous state of a landscape or ecosystem that has been knocked 'out of balance'. It is about retrieving so-called 'missing' or 'dysfunctional' ecological processes, or in other words 'restarting' them. The aim is to generate self-regulating ecosystems that will benefit the vast majority of species that do not thrive without help in modern cultural landscapes. The basic idea of rewilding is therefore to manage nature in a way that seeks to create what may be termed, in a striking oxymoron, 'controlled wildness'. Twenty-five years ago, three Cs (Cores, Corridors and Carnivores) characterised rewilding. Since then, the concept has evolved into a number of approaches with somewhat different characteristics, and today there are forms of rewilding in which these three elements are not all present (Carver *et al.*, 2021). However, this way of managing nature has given rise to rather fierce scientific debates over principles, means of management and the certainty of outcomes.

What makes rewilding a controversial *ethical* issue is the way in which its initiatives affect the various 'parties', or stakeholders: nature, the great herbivores and humans in the intersection between landscape restoration and animal welfare (Gamborg *et al.*, 2010). A key question is: What norms and values should guide the management of such areas and the animals?

We will not address this general question. Instead, we wish to discuss a particular case: a nationwide, state-driven, politically agreed rewilding initiative in Denmark from 2020 aiming to establish up to fifteen National Nature Parks (in Danish: 'Naturnationalparker'). In the parks, rewilding is planned to take place mainly by the help of domesticated animals (large herbivores such as horses and cattle) – a type of 'translocation rewilding'.

The National Nature Parks are designated for state-owned, mostly forested, land. They will range in size from 5 to 30 km², and most are expected to be surrounded by fences up to 2.5 m tall. There will be public access to these areas via gates, stiles and across cattle grids. The National Nature Parks will be kept free of forestry and agricultural production. Large predators are generally not present in the areas, but wolves may gain access to them, as may other non-hoofed animals. The parks work on a passive, or at least reduced, management principle. The animals in them are expected to find their own food all the year round. In some of the parks, male and female animals will be introduced to allow natural reproduction to occur. The animals will be supervised in accordance with the Danish Animal Welfare Act.

This new way of managing parts of the natural landscape in Denmark is now in the designation and planning phase, with work on the creation of the first five parks expected to begin this year (2022). The relatively short time span here – between conception of the plan, a pursuant bill being passed in parliament, and onset of implementation – has given rise to a public debate involving rewilding experts, other professionals, stakeholders and to some extent ordinary members of the public that is notably combative in comparison with discussions of other prominent nature conservation issues (Gamborg and Jensen, 2021). In particular, questions have been raised about the animals involved in the rewilding, and especially the use of domesticated animals (Jensen and Gamborg, 2021). How should they be regarded? How should they be treated, given that they are living in somewhat more natural conditions than most of their conspecifics: as domestic, or as wild animals? Should the way they are managed change over time if they are allowed to reproduce naturally and hence 'de-domesticate'? Should they fend for themselves, or should they continue to be thought of as animals in human care, differing from other domestic animals only in the special benefits they provide? Similar questions have also been raised in relation to the Dutch rewilding project in Oostvaardersplassen (Gamborg *et al.*, 2010).

So far, debates between the supporters (biologists and wildlife and nature special-interest groups) and opponents (organised outdoor recreational groups, horseback riders and mountain bikers, as well as some animal welfare groups and members of the public who are concerned about animal suffering) of translocation rewilding have been harsh and rather intractable. Alongside the obvious disagreement over substantive issues, the advocates of translocation rewilding have typically said they base their arguments on (scientific) facts. They say their opponents base their views on emotions. Their detractors claim that the facts presented by advocates are skewed, and that there is much more uncertainty involved than is acknowledged.

The arguments of the advocates and opponents of translocation rewilding are heavily based on values. It is just that they mobilise – see as relevant, and credible – *different* values. Biologists seem to emphasise biodiversity. Some veterinarians and animal advocates have stressed other values, in particular animal welfare, and seem to have conceptions of what constitutes good animal welfare that differs from that of the biologists. Moreover, the values that are shared, or at least recognised by both parties, are prioritised differently (often implicitly). Whether, and if so to what extent, values such as animal welfare, human quality of life, nature conservation and aesthetic benefit can work in tandem has been considered much less. And we know little about where the public is on these matters – and how united or divided its members are. This paper investigates what the public thinks. It is based on a survey that asks the public: What values could, and should, guide management in translocation rewilding, and how should they be prioritised? With answers to these questions, we present an empirical ethical analysis of this relatively new approach to rewilding.

Methods

Using a representative sample, (n=5,000) we investigate what the Danish population thinks about the rewilding in the National Nature Parks. We ask what knowledge and beliefs they have about these parks. For example, do they believe the parks will benefit biodiversity? Do they think that animals will suffer or thrive? We also examine attitudes to the parks and their management. For example, how important it is to try to improve biodiversity? Is it acceptable to fence in parts of nature? Is reduced public access a price worth paying? Are the potential costs in animal welfare justified? There are also questions designed to identify the public's hopes and concerns, or even fears, about the parks.

In addition, applying the Wildlife Value Orientation framework, we identify the respondents' value orientations. A value orientation forms part of an individual's hierarchical belief structure bearing on some object, such as wildlife. Empirical research has identified two main wildlife orientations: utilitarian and mutualist (Fulton *et al.*, 1996) and four orientation types. Roughly, *utilitarians* believe that wildlife should be used and managed primarily for the benefit of humans and are therefore likely to prioritise human welfare over wildlife in their attitudes and behaviour. *Mutualists* see the coexistence of humans and animals to be fundamental. They perceive wildlife as part of an 'extended family', with the animals being bearers of rights, including the right not to be killed. A person with a strong mutualist orientation is likely to support 'welfare-seeking' activities for the individual animal (e.g. feeding) and see wild animals in anthropocentric (human-like) terms. *Pluralists* have attitudes to wildlife spanning across the utilitarian and mutualist divide. A *distanced* orientation is characteristic of people who are not particularly interested in wildlife and related topics and are neither utilitarian nor mutualist as such.

The survey was initiated in spring 2022 (at the time of writing, data collection is ongoing) and approved by the Research Ethics Committee of Science and Health. The questionnaire has one section on general attitudes to nature and wild animals, one on National Nature Parks, and another focusing specifically on the management of animals in the parks. We are grouping respondents into value orientation types,

Section 2

using the Wildlife Value Orientation framework, and then analysing the data to identify, categorise and characterise general values related to the National Nature Parks. We are using Best-Worst scaling in relation to the National Nature Parks as such and animal management more generally to elicit public priorities.

Results

At the time of writing, as just stated, our data collection is ongoing. However, we will present results at the time of the conference. So here, instead of presenting actual results, we will briefly explain our expectations and what we know from previous studies.

We do not expect the beliefs and attitudes of the public to be as pronounced, or polarised, as they have seemed so far in the public debate. We anticipate that three clusters of value will characterise attitudes to the use of domesticated grazers in rewilding relating to nature, animals, and humans, and that the clusters will contain, as salient parts, naturalness, wildness, animal welfare, and human access and safety. Based on previous surveys of wildlife value orientation (Gamborg and Jensen, 2016), we expect about a third of the public to have a mutualist orientation type, about a third to be distanced, and that the remainder will be a roughly equal mix of pluralists and utilitarians.

A 2008 survey of the Danish public showed that 85% agreed that encountering wildlife on a visit to the natural landscape is important in the experience of nature (Jensen and Cleemann, 2018a), so we expect there to be high levels of interest in encountering animals in the parks. However, it is not necessarily all kinds of animals that people want to see or get closer to, especially if they bring children or dogs. We expect that the interest will be balanced by some concern for human safety. In the 2008 survey, 30% of respondents indicated they were somewhat afraid of horses, 15% of a cow, and 65% of a dog without leash. However, only 6% reported avoiding visits to nature out of a fear of encountering wildlife (Jensen and Cleemann, 2018b). It is important to note that these surveys were carried out at a time when there were no National Nature Parks and only a few fenced off nature areas in Denmark.

As regards the management of animals, and concerns about the animals, drawing on the same previous survey of the wildlife-related values of the Danish public (Gamborg and Jensen, 2016) we expect that around a third of the public will be worried mainly about safety, freedom of movement and access: these concerns are consistent with the distanced wildlife orientation. We also anticipate that a group of about the same share will be mostly concerned about the animals' well-being: this is in line with the mutualist wildlife orientation. Obviously, people with this last orientation will be unlikely to support management that could result in welfare losses for animals in rewilding areas.

Discussion

In the debate, opponents have argued that the establishment of National Nature Parks will amount to gambling with the health and welfare of the individual animals involved. Advocates of the parks have replied that the rate of mortality will hardly lie above what would be expected to occur 'naturally', and that there will always be a certain dynamic in animal welfare due, for example to severe winters and outbreaks of disease.

This brings to mind Oostvaardersplassen, the much-publicised Dutch project we mentioned at the beginning of this summary. Here, cattle, horses and deer were introduced to an approx. 50 km² site to prevent it from turning into forest and benefit biodiversity. With no major predators and sufficient food, the cattle, horses and deer thrived, and their populations rose. Nevertheless, in the harsh winter of 2017-2018 over 3,000 animals starved to death, as they could not move to other areas which wild

animals would otherwise try *and* unlike other domesticated animals were not given supplementary food or were culled (Kopnina *et al.*, 2019). Oostvaardersplassen lies close to roads and railways, and it was not long before the situation led to large public protests.

As a result, management became more active. Feeding the animals, and moving them to other areas or culling them to avoid them starving to death, were now permitted. This gave rise to a discussion about proper and humane treatment of animals in the area, and about acceptable levels of animal welfare. However, it also gave rise to new kind of public criticism: if management was as proactive as *this*, how could this be a *rewilding* project? Did it really involve *wild* nature?

Obviously, nature conservation and rewilding should not be based solely on the beliefs, aspirations, values and concerns of the general public. On the other hand, from a principled democratic point of view it seems reasonable to expect a public administered agency to act (somewhat) in line with pronounced values in the population. More instrumentally, better knowledge of public attitudes and values may help to minimise conflicts by serving as input for politicians devising policies on rewilding, for those designating parks, and for managers on the ground making concrete decisions about fencing, access, animal management and so on. It may also help to curb clashes between the park's management, different user groups, special interest organisations and other stakeholders by potentially adjusting preconceptions.

Knowledge of public perceptions can be used to inform the debate (and the decision makers) and to avoid nature conservation and outdoor recreational management that is governed by the principle that 'the squeaky wheel gets the grease'. We do not want those who shout loudest and most to get what they want, surely. Instead, the information can help us to work out what would make for fair or reasonable compromise between the rather divergent environmental views of different groups of individuals (Jensen *et al.*, 2011).

Conclusions

It seems clear that rewilding sits on a continuum of naturalness, human modification and management. The continuum ranges from 'true' wilderness areas, at one end, to such activities as wildlife-friendly farming, at the other (Gordon *et al.*, 2021). This flexibility in the concept of rewilding creates problems. As Carver *et al.* (2021) note: 'There has been much recent interest in the concept of rewilding as a tool for nature conservation, but also confusion over the idea, which has limited its utility.' Therefore, one challenge is to be clear about the type of rewilding one has in mind, and the goals it allows one to achieve. In addition – but much less discussed so far – there is the challenge of pinpointing the values underlying rewilding, just as various values, and several value dimensions, underlie our attitudes to the environment in general (see O'Neill *et al.*, 2008). These two challenges are connected, as it is reasonable to assume that there will be quite different expectations about, say, the level of animal welfare and degree of naturalness to aim for, depending on where rewilding lies on the continuum, and depending also on the kinds of animal used and the type of management employed. Translocation rewilding of the sort used in the Danish context lies on rewilding light side of the spectrum.

It should be recognised that rewilding practices – especially of the kind discussed in the paper – take place in a grey zone where humans intervene in various different ways in the course of nature, including in the lives of (domesticated and wild) animals. What the balance should be between active and passive nature management in rewilding cannot be determined purely as a scientific matter. It is also, and as much, an ethical issue, so both sets of issues – factual and valuational – should be included in a broad professional and societal discussion. To date, the discussions that have taken place within the scientific community, and in civil society, have been very polarised. We argue that there is a need for a more open

Section 2

and transparent discussion of the aims, the methods, the science and the uncertainties – and, not least, the underlying values – of rewilding.

References

- Carver, S., Convery, I., Hawkins, S., Beyers, R., Eagle, A., Kun, Z., ... and Soulé, M. (2021). Guiding principles for rewilding. *Conservation Biology* 35(6), 1882-1893.
- Dempsey, B. (2021). Everything under control? Comparing Knepp Estate rewilding project with 'traditional' nature conservation. *Plos one*, 16(6), e0241160.
- Fulton, D.C., Manfredo, M.J. and Lipscomb, J. (1996). Wildlife value orientations: a conceptual and measurement approach. *Human Dimensions of Wildlife*, 1, 24-47.
- Gamborg, C. and Jensen, F.S. (2016). Wildlife value orientations: A quantitative study of the general public in Denmark. *Human Dimensions of Wildlife* 21(1): 34-46.
- Gamborg, C. and Jensen, F.S. (2021). Naturnationalparker udfordrer vores syn på naturen. *Kronik. Jyllands-Posten* 13/4 (2021): 12.
- Gamborg, C., Gremmen, B. and Sandøe, P. (2010). De-domestication: Ethics at the intersection of landscape restoration and animal welfare. *Environmental Values* 19(1): 57-78.
- Gordon, I.J., Pérez-Barbería, F.J. and Manning, A.D. (2021). Rewilding lite: Using traditional domestic livestock to achieve rewilding outcomes. *Sustainability* 13(6), 3347.
- Jensen, F.S. and Cleemann, M.F. (2018a). Dyrelivet har stor betydning for naturoplevelsen. *Videnblade Planlægning og Friluftsliv* nr. 06.01-113. Institut for Geovidenskab og Naturforvaltning, KU.
- Jensen, F.S. and Cleemann, M.F. (2018b). Frygt og væmmelse for dyr påvirker kun naturbesøget lidt. *Videnblade Planlægning og Friluftsliv* nr. 06.01-112. Institut for Geovidenskab og Naturforvaltning, KU.
- Jensen, F.S. and Gamborg, C. (2021). Hegn, adgang og store græssere. *Momentum* 1: 10-13.
- Jensen, K.K., Gamborg, C. and Sandøe, P. (2011). The social dimension of pluralism: Democratic procedures and substantial constraints. *Ethics, Policy & Environment* 14(3): 313-327.
- Kopnina, H., Leadbetter, S. and Cryer, P. (2019). Learning to rewild: the failed case of the Dutch 'New Wilderness' Oostvaardersplassen. *International Journal of Wilderness* 25/3
- O'Neill, J., Holland, A. and Light, A. (2008). *Environmental values*. Routledge, London, UK, 233 pp.

17. Do we need a new land ethics?

A. Kallhoff

University of Vienna, Department of Philosophy, Universitätsstr. 7, 1090 Vienna, Austria;
angela.kallhoff@univie.ac.at

Abstract

Land ethics is usually associated with the proposal of Aldo Leopold to interpret and respect land as integral part of life. Today, land ethics is a neglected field of research in ethics. This contribution argues that a new land ethics is obligatory. Land has become a particularly contested resource. Instead of reiterating the proposals of Leopold and of either his followers or his critiques, this contribution tries to develop new horizons for discussing land as a particularly valuable resource. Against the backdrop of plant ethics, of land as a political category, and of concepts of natural heritage, land receives a normative meaning. This helps to think anew about land ethics as an important ingredient in environmental ethics.

Keywords: plant ethics, natural heritage, public goods, normative context

Introduction

Asked whether we need a land ethics, the answer will seldom be negative. Land has become a particularly scarce and valuable resource – in particular land that provides space for settlements and that can be used for agrarian goals. There is evidence that the land for agrarian purposes as well as habitable land is shrinking on a rapid path. In short, land is a very precious and fiercely contested resource. Land ethics, however, appears to start from a different angle. In his Sand County Almanac, Aldo Leopold once argued that land is more than a useful resource (Leopold, 1949). He wishes to reject a property- and resource-based reductions of land. Leopold instead supports the view that land is part and backdrop of the concert of life. In particular, respect for nature includes respect for the capacity of all individual living beings to flourish. Leopold's proposal works on the maxim: 'A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise.' (Leopold, 1949, pp. 224–225) Since then, environmental ethics has developed in a variety of ways. In *The Spirit of the Soil* Paul Thompson explains why we need to care about the surface of the land, the soil, for environmental reasons and in order to protect the land for the usage of future generations (Thompson, 2017).

One reason for not developing a land ethics is the severe critique of Aldo Leopold's work. Some argue that his land ethics amounts to romanticism, others even find ecofascism (Lo, 2001). It is not my goal here to discuss both. Instead, one of the ecocentric thinkers who agree with Leopold on some fundamentals of a land ethics, J. Baird Callicott, has recently argued that the biggest problem with Leopold is not the ecocentric outlook of a land ethics. Instead, the biggest problem is that it is local in scale; what is, however, needed in the Anthropocene is a global level. We need an earth ethics instead of a land ethics (Callicott, 2021).

This contribution argues that even though Callicott is right with respect to an ethics of the Anthropocene, we nevertheless need to pay attention to the category of space as an intrinsic element of a land ethics. Thus, we do need a *new* land ethics as compared to both Leopold's and Callicott's proposals. This contribution has three sections. The *first section* explains that land is the most important resource for plant life. As terrestrial beings, plants need life. Without enough land for plant life to unfold, we will not only continuously lose the diversity of green life, but also endanger our own survival. *Section two* explains the normative meaning of land from another angle. Land is not just one resource among

Section 2

others. Instead, land is contested because land is invested with property rights, and ultimately land is also territory. A land ethics needs to take into account the political meaning of land. One proposal to highlight the meaning of land as a shared resource resonates with recent debate of public goods. *Section three* pays tribute to the meaning of land from an altogether different angle. It argues that protection of land from usage is particularly important in the context of conversation goals.

Land in the focus of plant ethics

In order to protect plant ethics from a usual misunderstanding, it has to be noted first that plant ethics is not primarily about plants as valuable individuals whose unfolding deserves moral respect. Instead, plant ethics is about ethical principles that serve as guidelines for actions and civilisatory practices which in turn have a direct or indirect impact on plant life. Plant ethics also outlines the reasons why we should follow these principles. Basically, it is in the well-informed interest of humankind to protect in the flourishing of plants. In addition, some authors argue that there is no reason to think that plant life has no moral significance at all and that human interests override plant interests (Kallhoff *et al.*, 2018; Stone, 1996). Since plant life needs not only land in order to develop, but land to which plant communities have been adapted over centuries, respect for plant life includes the protection of land that serves as unique resource for distinct communities of plant life. In particular, plant life needs a lot of space to develop and to remain resilient. If we wish to protect biodiversity and if we honour plant life as a unique dimension of life on earth, we need to reserve land for plants to develop and to unfold.

The conflicts over the right amount of wild nature and of cultivated nature as opposed to utilized land is fierce. In terms of a land ethics, it is reasonable not to start with conflicting claims about distinct areas of land, but to think about ways to reconcile not only different claims, but also to develop a reasonable future map with distinct areas reserved for different types of usage. This map needs to resonate with diverse and long-term interests. Plant ethics can add to this picture the idea that plants as living beings have interests on their own⁵ and that reserving some space for a life-form different from human species can be regarded as a moral claim (Mancuso, 2021).

Land as a public good

Land has always been contested as territory of civilizations. Since territory is part of the definition of the nation state, fights about territory are particularly violent. In the context of a land ethics, the political struggle over land cannot be addressed in a sufficient way. However, to focus on land as politically contested space carries an important insight. A land ethics should not be blind with respect to the important political implications of land. Otherwise, the critique of romanticism might still be right. But how can a land ethics accommodate the political dimension of land without losing sight of the political complexity of justified claims and unjustified claims to land?

An initial idea can be derived from Joachim Radkau's monumental historic review of the relationship between nature and power (Radkau, 2002). The history is full of examples of the meaning of nature for power-relations, for the establishment of justified and unjustified power relations and of ways to settle property-rights even when nature does not offer a simple way to do so. In addition, it is helpful to understand natural common goods should not be appropriated by private owners, because a transformation into private properties can be detrimental. Following a proposal of Elinor Ostrom in addressing the Commons, it is helpful to understand that right titles to land are not entitlements to act on land as one wishes, but that they relate to norms that protect the resource as a common good (Ostrom,

⁵ For a discussion of the value of plants, the interests of plants and their general moral status, see (Kallhoff *et al.*, 2018, pp. 13-118).

1990). From the Roman Law onwards, land has also been regarded as a *bonum commune* – and therefore entitlements to act on land have been restricted by some presumptions that the common property shall be protected from maluse. This idea needs to be an integral part of a land ethics. It is not the space here to unfold principles that should guide access to land as a common good; it is, however, important to note that land owners – public as well as private – in a normative perspective do not automatically have the full range of entitlements according to concepts and normative ideas inherent in the idea of land as a *bonum commune*.

One way to acknowledge this normative view on land as a common resource can be spelled out in normative theories of public goods (Kallhoff, 2011). Public goods differ from private goods in many respects. According to the classic definition of a public good, it is non-rival and non-exclusionary in consumption (Sturn, 2010). Different from that technical interpretation, public goods are also a material expression of the *bonum commune*. As such, land also belongs to the public and should be used according to principles of a common good (Kallhoff, 2011, 2014). This interpretation also takes into account that life-sustaining goods should to some degree belong to the public for reasons of social justice. According to this view, decisions over public goods should to some degree relate to the self-determination of the citizenry in democratic states. Decisions on public goods are not reduced to a utilitarian calculus; instead, long-term interests of the citizenry need to be respected.

Land in the perspective of natural heritage

When we think about land, we usually do not relate this to ideas and concepts of natural heritage. However, this link should be made. The World Heritage Convention aims at ‘establishing an effective system of collective protection of the cultural and natural heritage of outstanding universal value.’ (UNESCO, 1972) That focus on particularly prominent natural places has already received critique (Kallhoff, 2020, Rodney, 2015, Heyd, 2006). Instead of focusing exclusively on the beauty of wild and spectacular nature, it is important to acknowledge the value of nature as wild nature, but also as cultivated and therefore also appropriated nature. It can even be argued that human rights and a right to natural heritage relate to each other (Meskell, 2010).

As for a new land ethics, it is important to acknowledge that the separation from landscape, nature and land is highly artificial. A similar idea is encapsulated in the concept of ‘cultural landscapes’ that was introduced as a new category by the World Heritage Convention.⁶ In the context of deliberation about natural heritage and the protection of nature for future generations, it is important to also acknowledge that this will not do without also protecting land from utilization for short-term interests (Kallhoff, 2021). In particular, the protection of landscapes is at the heart of the project to protection of natural heritage for future generations.

Conclusions

Even though this contribution has the modest goal to present some initial ideas of a new land ethics, some lessons can be taken. Instead of repeating the debate on value-based land ethics vs utility-based

⁶‘The term ‘cultural landscape’ embraces a diversity of manifestations of the interaction between humankind and its natural environment. Cultural landscapes often reflect specific techniques of sustainable land-use, considering the characteristics and limits of the natural environment they are established in, and a specific spiritual relation to nature. Protection of cultural landscapes can contribute to modern techniques of sustainable land-use and can maintain or enhance natural values in the landscape. The continued existence of traditional forms of land-use supports biological diversity in many regions of the world. The protection of traditional cultural landscapes is therefore helpful in maintaining biological diversity.’ (UNESCO, 2022)

Section 2

land ethics, it is obligatory to address the problem of extreme scarcity by recalling some important normative contexts. Plant ethics helps to understand the problem that land is not only necessary for settlements, infrastructure and agriculture. Land is also the most important resource for plant life to unfold. Plant ethics also presents arguments to rethink the distribution of land along the lines of space for the unfolding of nature and evolutionary processes, cultivated land and land that is used for other purposes. Since humankind needs plant life to survive, it would be wise to reserve land for 'wild' nature. My second argument relates to the power-blindness of land ethics. I have proposed a discussion of land as a public good and explained some of the implications of that perspective. Finally, land is also an abstraction from natural landscapes. If we wish to protect natural heritage for future generations, we should also think anew about land that is exempt from utilization by short-term interests.

It goes without saying that much more would have to be said about justified entitlements to land, in particular in the discourse on indigenous rights, the loss of land by pollution and also by climate change, and the need to care much more for land in our civilisatory practices of settlements. However, a reminder of the normative meaning of land in the three contexts of plant ethics, public goods theory, and the natural heritage discourse might be a first step to reflect land from a different angle and to start to rethink that category in ethics.

References

- Callicott, J.B. (2021). The Land Ethic and the Earth Ethic(s). *Ethics, Policy & Environment* 24(1): 27-43.
- Harrison, R. (2015). Beyond 'Natural' and 'Cultural' Heritage: Toward an Ontological Politics of Heritage in the Age of Anthropocene. *Heritage & Society* 8(1): 24-42.
- Heyd, T. (2006). Nature, Culture, And Natural Heritage: Toward A Culture Of Nature. In: Sigurjónsdóttir, Æ and Jónsson, Ó.P. (eds.) *Art, Ethics and Environment: A Free Enquiry Into the Vulgarly Received Notion of Nature*. Cambridge Scholars Press, Angerton Gardens, UK, pp. 142-161
- Kallhoff, A. (2011). *Why democracy needs public goods*. Lexington, a Division of Rowman & Littlefield Publishing Group, Lanham, Maryland, USA.
- Kallhoff, A. (2014). Why societies need public goods. *Critical Review of International Social and Political Philosophy* 17(6): 635-651.
- Kallhoff, A. (2021). The Intergenerational Value of Natural Heritage. In: Gardiner, S. M. (ed.) *The Oxford Handbook of Intergenerational Ethics*. Oxford University Press, Oxford, UK.
- Kallhoff, A., Di Paola, M. and Schörgenhuber, M. (eds.) (2018). *Plant ethics: Concepts and applications*. Routledge, London, UK.
- Kallhoff, A. (2020). Integrität als Konzept der Naturethik. Eine Diskussion am Beispiel pflanzlichen Lebens. *Zeitschrift Für Praktische Philosophie* 7(2): 171-190.
- Leopold, A. (1949). *A Sand County Almanac*. Oxford University Press, Oxford, UK.
- Lo, Y. S. (2001). The Land Ethic and Callicott's Ethical System (1980-2001): An Overview and Critique. *Inquiry* 44(3): 331-358.
- Mancuso, S. (2021). *The Nation of Plants* (Conti, G., Trans.) Other Press, New York, USA. (Original work published 2019).
- Meskill, L. (2010). Human Rights and Heritage Ethics. *Anthropological Quarterly* 83(4): 839-859.
- Ostrom, E. (1990). *Governing the Commons. The Evolution of Institutions for Collective Action*. Cambridge University Press, Cambridge, UK.
- Radkau, J. (2002). *Natur und Macht. Eine Weltgeschichte der Umwelt*. Beck, München, Deutschland.
- Stone, C. D. (1996). *Should Trees Have Standing? And Other Essays on Law, Moral and the Environment*. Oxford University Press, Oxford, UK.
- Sturn, R. (2010). 'Public goods' before Samuelson: Interwar Finanzwissenschaft and Musgrave's synthesis. *The European Journal of the History of Economic Thought* 17(2): 279-312.

- Thompson, P.B. (2017). *The spirit of the soil: Agriculture and environmental ethics*. (2nd ed.) Routledge, Taylor & Francis Group, London, UK.
- United Nations Educational, Scientific And Cultural Organisation (UNESCO) (1972). *Convention Concerning The Protection Of The World Cultural And Natural Heritage*. Adopted by the General Conference at its seventeenth session (Paris, 16 November 1972) Available at: <https://whc.unesco.org/archive/convention-en.pdf>.
- United Nations Educational, Scientific and Cultural Organisation (UNESCO) (2022). *Cultural Landscapes*. Available at: <http://whc.unesco.org/en/culturallandscape/>.

18. Challenging our thinking about wild animals with common-sense ethical principles

T. Katz* and I. Wallimann-Helmer

University of Fribourg Environmental Sciences and Humanities Institute, Ch. du Musée 4, 1700 Fribourg, Switzerland; tristan.katz@unifr.ch

Abstract

Significant disagreement remains in ethics about the duties we have towards wild animals. This paper aims to mediate those disagreements by exploring how they are supported by, or diverge from, the common-sense ethical principles of *non-maleficence*, *beneficence*, *autonomy* and *justice* popular in medical ethics. We argue that these principles do not clearly justify traditional conservation or a 'hands-off' approach to wild-animal welfare; instead, they support *natural negative* duties to reduce the harms that we cause as well as *natural positive* duties to promote the welfare of wild animals.

Keywords: non-maleficence, beneficence, autonomy, justice, duties

Introduction

Wild animals are all around us, far outnumber us, and are impacted by us in numerous ways. Yet if one consults the ethical literature, one will find significant debate about the types of moral duties we have towards them (or if we have any at all). While various positions on this question have been produced, their incompatible starting positions often lead to wildly different conclusions. Although a fundamental resolution between these theories is unlikely, some positions claim greater plausibility by arguing that they cohere better with our basic moral beliefs.

The aim of this paper is to present a *prima-facie* argument in favour of positions which claim *natural negative* and (more importantly) *natural positive* duties toward wild animals by showing that they can be supported by 'common-sense' ethical principles. The argument is *prima-facie* in that common-sense morality gives us reasons in favour of certain views, absent any particular compelling or agreed-upon ethical theory.

We proceed as follows. First, we state our working assumptions. Secondly, we categorize theories within wild-animal-ethics according to the types of duties they propose. Thirdly, we describe four principles often taken to represent common-sense morality: *non-maleficence*, *beneficence*, *autonomy* and *justice*. Finally, we discuss how each principle should be understood with regards to wild animals and the types of duties each principle points towards.

Working assumptions

As a starting-point for our argument, we assume a sentientist account of moral status. Sentientism is the position that sentience is necessary and sufficient for moral status. Sentient beings are the *source* of value, however other living or non-living things may nonetheless have derivative and intrinsic value (Jamieson, 1998). As a consequence of this view it is hard to justify discrimination on the basis of species alone, and it follows that, *ceteris paribus*, one should give the interests or rights of animals from different species equal consideration (Horta, 2010).

Different views within wild-animal ethics

We group ethical theories about wild animals into five categories, based on the types of duties which they claim should guide our moral thinking towards wild animals. This categorisation is not meant to be exhaustive, but simply to capture the different ways of thinking about wild animals. The order of the categories reflects a general trend from least to most-demanding.

1. No duties.
2. Indirect duties.
3. Natural negative duties.
4. Natural negative and special positive duties.
5. Natural positive and negative duties.

Categories 1 and 2 are anthropocentric positions which deny the moral status of animals, and are incompatible with our non-speciesist starting assumption. Category 2 includes theories inspired by Immanuel Kant which claim that, while we have no duties to animals themselves, harming them is wrong indirectly due to the effect it can have on our moral character.

Category 3 theories claim that we have a natural negative duty not to harm wild animals, but no positive duties to benefit them. Natural duties are grounded in the intrinsic nature of sentient, rather than any other fact about them, and for most theorists the specifically relevant aspect of animals' nature is their sentience. The rights-theorists Tom Regan (1983) and Gary Francione (2008) fit into this category. Regan argues that we should 'protect wild animals from those who would violate their rights', but that 'being neither the accountants nor managers of felicity in nature, wildlife managers should be principally concerned with *letting animals be*'. Similarly, the virtue-ethicist Rosalind Hursthouse (2011) argues that, even when wild animals face great hardship, 'respect still entails leaving them to live their own form of life'.

Category 4 theories agree with the natural negative duties of category 3, but argue in addition for *special* positive duties towards wild animals. Special duties are owed due to some non-intrinsic fact about an individual. The prototype of this category is Clare Palmer (2010), who argues that we only have positive duties towards wild animals when we have established certain relationships with them. In the absence of such special conditions, no positive duties pertain. Alongside her, Donaldson and Kymlicka (2011) argue that the relationships wild animals have within self-regulating communities, and how they refuse human interference, gives us duties to respect their autonomy. While Donaldson and Kymlicka do accept natural, rights-based positive duties towards domesticated and 'liminal' animals, they argue that our relation-based duties to wild animals *cancel out* those positive duties in most cases, placing their theory most suitably in this category.

Finally, category 5 theories argue for both natural negative and natural positive duties. It is this category which we argue is best supported by common-sense ethical principles. Here the very nature of wild animals gives us reasons not only to avoid harming them, but also to promote their flourishing or well-being. Most notable in this category are Oscar Horta (2017), Martha Nussbaum (2006), and Jeff McMahan (2015). Importantly, claiming that we have natural positive duties towards wild animals does not exclude the possibility of having special duties *in addition*. This is evident in Cochrane's theory (2018), which claims that all sentient animals have rights based on their interests, however animals' *political* entitlements are based on their relationships with us. Although relationships play an important role in Cochrane's theory, *all* wild animals are said to have relationships with humans which justify political rights, making the question of sentience ultimately more decisive for defining our duties towards them.

The role of common-sense ethical principles

It is often thought that the coherence of an ethical theory to our ordinary moral thinking gives it greater *prima-facie* plausibility, but our ordinary moral thinking is notoriously prone to logical fallacies and biases. Capturing the common-sense morality in ethical principles and then applying them systematically can help to avoid such errors and provide a more solid basis for defending particular theories.

In the medical field, the four principles of non-maleficence, beneficence, autonomy and justice have gained wide popularity due to their ability to capture the moral concerns of different people both within academia and practice. We follow Beauchamp and Childress who argue that they capture the values of common-sense morality, at least in western democratic societies (2013). They can be defined as follows:

- Non-maleficence: abstain from causing harm to others.
- Beneficence: act for the benefit of others (contribute to their health, welfare or flourishing).
- Autonomy: support and respect autonomous choice of others.
- Justice: ensure that individuals are treated fairly (treat equal cases equally and unequal cases unequally).

As this paper remains at a very general level, looking at all the ways we can consider wild animals, we provide only a broad discussion of each principle and the duties they might entail. For ethical guidance in particular situations these principles would need to be further specified and then weighted against each other.

Non-maleficence

Beauchamp and Childress define non-maleficence as the avoidance of *inflicting* harm, in contrast with *preventing* harm which is captured by beneficence. Reasons to avoid harming others are therefore considered separately from reasons to protect or improve others' welfare, and non-maleficence establishes *greater* reason to avoid causing harm. In the environmental context this justifies taking a precautionary approach in decision-making, especially due to the complexity of ecosystem processes and our limited understanding about the determinants of wild-animal welfare.

All theories in animal ethics which are compatible with sentientism (categories 3-5) consider harms to sentient wild animals to be problematic regardless of context or other special conditions, and a straight-forward understanding of non-maleficence across different contexts implies no different. We therefore take this principle to uncontroversially establish a natural negative duty. It implies that we should identify harms and make efforts to reduce them – not merely intentional harms like hunting, but also unintentional harms, which account for a greater amount of wild-animal suffering (Fraser, 2019). This has large implications for many human activities: it gives us reason to consider and take seriously the wellbeing of wild animals whenever designing, constructing and managing urban areas (Animal Ethics, 2021); to reduce the harms to wild animals in our agricultural systems; to limit deforestation dramatically; and to prevent the introduction of alien species.

Beneficence

Beneficence is about improving the welfare or flourishing of others. Beneficence has been described both as a natural duty (e.g. owed to all sentient beings), and as a special duty (e.g. based on particular relationships or proximity). Here wild-animal ethicists tend to disagree, with those in category 5 understanding beneficence as a natural duty, and those in category 4 understanding it as a special duty. As a principle of common-sense morality, beneficence must be owed in some form to at least some wild animals, giving *prima-facie* reason against the validity of categories 3, 2 and 1.

To assess whether beneficence is best understood as a natural or special duty, it is useful to compare its application to human cases. We believe that wild animals are best compared to distant strangers because, in virtue of being wild, we typically have no relationship or shared background with them. Fortunately, there is a vast literature on the duty to aid distant strangers, and while there is significant disagreement about *how much* we owe to distant strangers, virtually all writers agree that some duty of beneficence is owed (Hadley, 2006). This is not because of any special relationship but because they matter, morally. Similarly, with nonhuman animals, some may argue that we have weaker duties towards them, just as we have weaker duties towards strangers when compared to friends. But it is not clear why the species-category would affect the *kind* of duty beneficence is; rather, beneficence seems to extend to all who can be benefited.

In the case of wild animals, many authors have argued in recent years that most individuals endure very poor welfare (Horta, 2015; Ng, 1995; Tomasik, 2015). Wild animals frequently struggle to find food, water, and shelter, and face disease and violence from predators, parasites, members of other species or even their own. Because such suffering arises due to fundamental conditions of natural ecosystems, such as high reproductive rates and the scarcity of resources, in most cases it is not clear that there is any feasible action we could pursue to mitigate this suffering at little cost to ourselves or other sentient animals (Horta 2015). Nonetheless, there are at least some cases where such opportunities arise, such as encounters with injured or orphaned animals who can be rescued and taken to a rehabilitation facility. Moreover, we argue that Singer's postulate suggests that as a society we at least have a duty to research potential interventions in case effective and low-risk options can be identified.

Some writers such as Donaldson and Kymlicka (2011) have argued that other considerations, such as respect for autonomy, not only oppose duties of beneficence for wild animals but cancel them out completely. This question will be dealt with in the following section.

Respect for autonomy

The principle of respect for autonomy motivates us both to respect the autonomous choices and wishes of others and to support others to be able to express their autonomy. Consequently, it leads to both positive and negative duties. As a negative duty, the respect for autonomy appears to be natural: we should respect individuals' informed choices or desires simply because they are agents capable of choice (i.e. have the ability to act intentionally), and this appears to apply to all agents regardless of species, relationship, distance and so on. Not all sentient wild animals have the ability to act intentionally, so the principle of autonomy will not apply in all cases. Nonetheless, the principle applies as long as at least some do (e.g. see Beauchamp and Wobber [2014] for an argument for autonomy in chimpanzees).

But it is less clear in what cases we have positive duties to support the autonomy of wild animals. Donaldson and Kymlicka (2011) argue in favour of a very limited natural, positive duty on the grounds that, *qua* beings with a good that is promoted by autonomous living, wild animals confer on us a negative duty to intervene in their communities as little as is necessary. This is because, they argue, wild-animal communities are able to regulate themselves well, and because species have adapted to be able to survive despite predation and other environmental pressures. This negative duty (with the exception of natural disasters) *cancels out* any positive duties of beneficence we might owe wild animals.

Contrary to Donaldson and Kymlicka, a proper understanding of natural processes makes clear that in most cases wild animal communities are not able to safeguard the wellbeing of their members. Most wild animals are unable to meaningfully express their autonomy due to the types of environmental pressures described in the previous section (Horta, 2013; Mannino, 2015). To use the terminology of Raz (1986), one cannot be considered to have an 'adequate range of options' when one is struggling (and

Section 2

often failing) to survive. As a consequence, it seems that respect for autonomy gives us much stronger positive, natural duties to *help* agency-possessing wild animals, than Donaldson and Kymlicka assume. At the very least, respect for autonomy cannot be said to cancel out duties of beneficence in all cases, and it seems that in many cases it actually justifies natural positive duties.

Justice

The principle of justice mainly concerns fair distribution and treatment. For that reason, as with others in the literature, we focus on distributive and rectificatory justice (e.g. Johannsen, 2021). However, it is unclear whether the concept of distributive justice should be extended to wild animals.

Most conceptions of distributive justice define it according to a particular community or political group, thereby making it a special positive duty. Cochrane (2018) argues that because we affect wild animals in numerous ways we should consider them part of our community, giving them the right to a fair distribution of resources. However, it is not clear why merely affecting someone should make them part of your community. Alternatively, it could be argued that only rectification is needed for harms. Because this duty applies only where an individual is directly responsible or complicit in a harm, it is also best understood as a special positive duty. It may be then that we should avoid harming wild animals, try to rectify the situation when we do, but that ensuring a fair distribution, being based on community membership, in general is not required.

Due to the widespread nature of wild-animal suffering, if we were to extend distributive justice to wild animals, a 'fair distribution' might be incredibly demanding. But, assuming that distributive justice does not apply to wild animals, rectificatory justice may more intuitively capture what we think we owe wild animals. Indeed, environmental conservation can be understood as rectification. Still, with the widespread destruction of ecosystems and the effects of climate change, it seems that a very great amount is owed (Hettinger, 2018). But conservation faces two challenges: firstly, because ecological restoration takes time, many individuals who deserve compensation will not survive to benefit from it; and secondly, due to natural wild-animal suffering, conservation might not benefit the victims of injustice (if other competing populations increase) or it might cause harms to others. Nonetheless, rectificatory justice does support other interventions not necessarily aligned with conservation, such as rescuing animals from human-caused environmental disasters and caring for or rehabilitating them.

Conclusions

Two of the common-sense ethical principles discussed in this article supported natural positive duties towards wild animals (beneficence and autonomy), while two supported natural negative duties (non-maleficence and autonomy). Finally, the principle of justice supported positive special duties. Considered together, our application of the principles indicates that theories suggesting both natural negative and natural positive duties best cohere with our common-sense moral thinking. This analysis lends prima-facie support for theories of category 5. Readers who disagree must show a more compelling account of common-sense ethical principles, or alternatively face the burden of proof to demonstrate why a particular theory of category 1-4 is more compelling. This conclusion will be surprising to many writers in the field, as it shows that positions in categories 1-4, which many defend on the basis of their coherence with common morality, are not in fact supported by common-sense ethical principles.

References

- Animal Ethics (2021). Investigating the welfare of wild animals in urban environments. Oakland. Available at: <https://www.animal-ethics.org/welfare-urban-animal-ecology>. Accessed 10 February 2022.
- Beauchamp, T.L. and Childress, J.F. (2013). *Principles of Biomedical Ethics*. Oxford University Press, Oxford.
- Beauchamp, T.L. and Wobber, V. (2014). Autonomy in chimpanzees. *Theoretical Medicine and Bioethics*, doi:10.1007/s11017-014-9287-3.
- Cochrane, A. (2018). *Sentientist Politics: A Theory of Global Inter-Species Justice*: Oxford University Press, Oxford.
- Donaldson, S. and Kymlicka, W. (2011). *Zoopolis: A Political Theory of Animal Rights*. OUP Oxford, Oxford.
- Francione, G.L. (2008). *Animals as persons: Essays on the abolition of animal exploitation*. Columbia University Press, New York.
- Hadley, J. (2006). The Duty to Aid Nonhuman Animals in Dire Need. *Journal of Applied Philosophy*, doi:10.1111/j.1468-5930.2006.00358.x.
- Hettinger, N.E. (2018). Naturalness, wild-animal suffering, and Palmer on laissez-faire. *Les ateliers de l'éthique/The Ethics Forum*, doi:10.7202/1055118ar.
- Horta, O. (2010). What is Speciesism? *Journal of Agricultural and Environmental Ethics*, doi:10.1007/s10806-009-9205-2.
- Horta, O. (2013). Zoopolis, interventions and the state of nature. *LEAP*, 1, 113-125.
- Horta, O. (2015). The Problem of Evil in Nature: Evolutionary Bases of the Prevalence of Disvalue. *Relations*, doi:10.7358/rela-2015-001-hort.
- Horta, O. (2017). Animal Suffering in Nature: The Case for Intervention. *Environmental Ethics* 38(3), 261-279.
- Hursthouse, R. (2011). Virtue Ethics and the Treatment of Animals. In *The Oxford Handbook of Animal Ethics*.
- Jamieson, D. (1998). Animal Liberation is an Environmental Ethic. *Environmental Values* 7(1), 41-57.
- Jeff McMahan (2015). The Moral Problem of Predation. In *Philosophy Comes to Dinner* (pp. 278-304): Routledge.
- Mannino, A. (2015). Humanitarian intervention in nature: crucial questions and probable answers. *Relations* 3(1).
- Ng, Y.-K. (1995). Towards welfare biology: Evolutionary economics of animal consciousness and suffering. *Biology & Philosophy*, doi:10.1007/BF00852469.
- Nussbaum, M.C. (2006). *Frontiers of Justice: Disability, Nationality, and Species Membership*. The Belknap Press, Cambridge.
- Palmer, C. (2010). *Animal ethics in context*. Columbia University Press, New York.
- Raz, J. (1986). *The Morality of Freedom*: Clarendon Press.
- Regan, T. (1983). *The Case for Animal Rights*. University of California Press, Berkeley.
- Tomasik, B. (2015). The Importance of Wild-Animal Suffering. *Relations* 3(2), 133-152.

19. Urban nature experiences for public health: an embodied perspective

S. McBride* and I. Wallimann-Helmer

University of Fribourg, Environmental Sciences and Humanities Institute, Chemin du Musée 4, 1700 Fribourg, Switzerland; shea.mcbride@unifr.ch

Abstract

Initiatives advocating for nature-based solutions, such as increased urban biodiversity, aim to promote public health as a part of creating sustainable cities. These initiatives are supported by a plenitude of scientific literature demonstrating the link between human health and nature contact. Despite these findings, positive human-nature interactions are declining worldwide, negatively effecting human development and health. We support an embodied approach to mental health. Taking this approach seriously illuminates how cities can be enhanced by modifying environmental and social affordances and the ways in which urban dwellers interact with urban natural greenspaces. We argue that urban nature experiences can be used to promote mental health, but that indicators of environmental injustice need to be addressed.

Keywords: urban design, embodied cognition, affordances, green spaces, environmental justice

Introduction

Given the ongoing environmental crises and the high rate of urbanisation, there is increasing political interest in promoting nature-based solutions for public health as part of creating sustainable cities (Bauduceau *et al.*, 2015). Nature-based solutions are defined as ‘actions to protect, sustainably manage and restore natural and modified ecosystems in ways that address societal challenges effectively and adaptively, to provide both human well-being and biodiversity benefits.’ (Cohen-Shacham *et al.*, 2016). A growing body of evidence supports these initiatives by linking nature contact to health benefits, such as stress reduction, attention restoration, improvement in mood and cognitive performance, quickened recovery from illness, and feelings of relaxation (Franco *et al.*, 2017; Kondo *et al.*, 2018; Myers, 2020). However, positive human–nature interactions are progressively declining around the globe – a phenomenon referred to as the ‘extinction of experience’ (Pyle, 1978), which is purported to pose serious threats to human health, childhood development, and support for biodiversity conservation (Soga and Gaston, 2016). Additionally, biodiverse urban green spaces, which help attenuate urban environmental stressors, such as noise pollution and urban heat island effects (Marselle *et al.*, 2021) are often distributed unequally, correlating with socio-economic status, leading to inequalities in health benefits for members of disadvantaged social groups (Jennings *et al.*, 2016; Lin *et al.*, 2021; Rigolon, 2016). Accordingly, access to urban nature, and to which types and qualities of nature, become issues of public health and environmental justice.

In this paper we address how the design of the built environment can foster mental health. We do so by taking seriously the notion of embodiment: that the mind, and thus brain and mental health, are deeply and inextricably dependent on the continuous interactions between the brain, body, and environment (Gallagher, 2017). Using an embodied approach, we argue that urban design and planning can be enhanced by modifying environmental and social affordances (opportunities for action) and the ways in which urban dwellers interact with them (Ramstead *et al.*, 2016). We contend that urban nature experiences can support an embodied approach to mental health, but that several indicators of injustice

need to be addressed. In the next section we present some of the growing body of literature showing the health effects of direct experiences of nature, especially in urban contexts. We then show why these effects can best be understood through the interdisciplinary lense of embodied cognition and what normative implications can be derived from this. Finally, we show what are the crucial environmental justice issues to be considered when implementing urban design according to the criteria we developed.

The nature-health link

Health can be approached from two perspectives: the traditional pathogenic model, i.e. focusing on causes of diseases or a salutogenic approach, i.e. focusing on the factors that support health and well-being (Antonovsky, 1996). We agree with the line of thinking that promotes a salutogenic approach to design (Dilani, 2009). What this might mean and how this might inform guidelines for urban design can be shown by a short look at findings tying positive nature experiences to health benefits.

People have long touted the salubrious effects of contact with nature (Franco *et al.*, 2017; Olmstead, 1952; Spence, 2021), but only relatively recently have researchers begun to study and quantify the link between human health and nature. In 1984, Roger Ulrich found that hospital patients recovering from gall bladder surgery whose room had a window with a view of trees healed quicker and with less pain medication than those with a view of a wall (Ulrich, 1984). This motivated a new line of research focused on understanding how nature influences our health and well-being. Today, a diverse and vast scientific literature supports the human health value of nature and that access to natural settings are an essential component of creating liveable and sustainable cities (USDA, 2018).

Exposure to nature can improve health through stress recovery and attention restoration (Kaplan, 1995; Ulrich *et al.*, 1991). Visual perception has traditionally been prioritised in research in the West, but evidence supports the view that all our senses are important, as well as non-sensory pathways (Franco *et al.*, 2017; Myers, 2020). One example is *Shinrin-yoku*, known as ‘forest bathing’, which refers to mindful sensory engagement with the forest, including paying attention to the sights, sounds, smells, and feel of nature (Spence, 2021; USDA, 2018). Researchers found that forest walks, as compared to urban walks, beneficially influence stress physiology, markers of inflammation and immunity, affective state and attitude, blood pressure, and heart rate variability (Wen *et al.*, 2019). This practice, which originated in Japan in the 1980s, has gained widespread popularity because issues of the mind require a ‘whole-body’ approach (Myers, 2020).

Interestingly, biodiversity might be relevant for the psychological benefits of nature. People who spent time in a park with more plant and bird species diversity reported higher on measures of psychological well-being than those who spent time in a less biodiverse park (Fuller *et al.*, 2007). While there is some evidence supporting the link between biodiversity and mental health, more research is needed to establish a causal relationship (Marselle *et al.*, 2019). Even though the causal mechanisms underlying the nature-health link are still unclear, what we do know so far provides a compelling case for maintaining and expanding natural green spaces in cities and bringing people closer to nature.

These examples illustrate how the design of the built environment can support public health by focusing on environmental conditions that contribute to health, such as positive nature experiences. While a pathogenic approach can propose normative guidelines of how to avoid insufficient access to urban nature, a salutogenic approach can provide guidelines for how to design and maintain urban natural greenspaces.

Embodied cognition and affordances in the built environment

In the previous section we framed the nature-health link, now we draw on concepts from theories of embodied cognition to develop an embodied approach to mental health and well-being. We argue that this approach can direct urban designers and planners how to enhance the lived experiences of city inhabitants by modifying the environmental and social affordances of natural green (or blue) spaces.

Theories of embodied cognition maintain that human cognition is deeply tied to and dependent on the subjective experience of being in a body that is embedded in a physical and social environment (Shapiro, 2021). In short, studying the brain is necessary, but not sufficient for understanding the mind. Moreover, according to enactivist approaches to embodiment, cognition is not possible without action (Varela *et al.*, 1991). We cannot look at the brain without looking at the action-perception cycle; the environment is acting upon us, and we upon the environment, thus creating a dialogue. The emphasis is on the dynamic co-modulatory coupling between brain, body, and environment, thus dissolving clear-cut boundaries between this triad (*ibid.*). By focusing on the dynamics of brain-body-environment, enactivism offers a holistic conception of cognition (Gallagher, 2017).

Approaches to embodied cognition make use of the notion of *affordances*. Originally introduced by ecological psychologist J.J. Gibson, affordances are the perceivable environmental opportunities for action, which are defined in relation to the agent's body (1979). Chemero expanded upon Gibson's notion of affordances, defining them as relations between an agent's abilities to perceive and act and features of the environment (2009). In other words, they are understood to be dynamical organism-environment relations. The environment is broadly construed, and includes the physical, cultural, and social environment. According to this approach, we perceive the world in terms of affordances, that is, we perceive the world as opportunities for action (Ramstead *et al.*, 2016).

Some studies investigated the types of affordances outdoor environments can provide to children (e.g. Cosco, 2006, Zamani and Moore, 2013). In one study, Kytä (2002) found that rural environments have the potential to afford more social and play behaviours than urban environments. Others used the affordance concept to assess how restoration gardens can aid in the recovery of stress and stress-related illnesses (Grahm *et al.*, 2010). Stolz and Schaffer (2017) used an affordance approach to model how edible forests in urban green spaces could be used to provide affordances for human health and potentially even encourage pro-environmental behaviours. Many factors affect the affordances perceived, including individual needs and characteristics, social variables, and physical environmental conditions (*ibid.*).

As a consequence of these observations, urban designers can improve the lived-body experiences within the built environment by taking into account the available affordances to urban dwellers. Our bodies constrain how we perceive and how we act upon the world, and the ways in which we interact with our environments influence how we think and develop our self-identity. In other words, our bodily interactions with the environment shape mental functioning and affect human well-being. By facilitating salutogenic affordances within the built environment, we can support human health and development. Hence, normative guidelines for urban planning should promote conditions of the built environment which contribute to rather than detract from human and environmental health and well-being. One such way would be for the design and planning of urban environments to include both conserving biodiversity and providing fair opportunities (affordances) for urban dwellers to experience it. To this concern we now turn in the next section that follows.

Environmental and procedural justice concerns

Environmental justice researches the distribution of environmental goods and burdens. In what follows we argue that the use of urban nature experiences as a nature-based solution to foster mental health requires careful consideration of issues of distributive and procedural justice. From a mental health perspective, urban planners need to take into account not only unequal access to urban nature, but also the fair distribution of nature of appropriate environmental quality. Not all green spaces are equally beneficial to inhabitants, and often impoverished or marginalised populations have less access to high quality green spaces (Rigolon, 2016).

For these reasons of justice it is important that both quantity and quality are considered when setting minimum targets for the just distribution of natural green space. Linked to this is the potential of urban nature to disproportionately benefit disadvantaged populations by offsetting some of the effects of poverty and reducing health disparities (Frumkin *et al.*, 2017, Jennings *et al.*, 2016), and whether these populations should be prioritised (e.g. based on past injustices or socio-economic status). However, decision-makers must also take into account that urban greening and improved access to nature can unintentionally harm vulnerable populations, i.e. via 'green gentrification' (Wolsh *et al.*, 2014). Greening a low-income neighbourhood can make it more attractive and desirable, which may raise housing costs and unintentionally displace or exclude the residents it was intended to benefit.

Another consideration for the planning and designing of urban green spaces is that cultural and contextual factors can affect nature preferences and nature experiences (Clayton *et al.*, 2017), making it essential to engage the relevant stakeholders in the planning and creation of natural green spaces. This is especially relevant given that health outcomes from nature experiences can vary depending on contextual factors. Involving local stakeholders in fair decision procedures gives attention to the diversity of embodied experiences and overcomes an assumed uniformity or 'one size fits all' model of what urban nature should be and how it should be designed. This avoids creating new normative behaviours for how public space should be utilized (Myers, 2020). Additionally, it may allow individuals or communities to perceive affordances in urban nature that they might not have based on previous social exclusion from those areas.

Conclusions

Today, more than half of the world's human population live in urban environments, and it is estimated to increase to two-thirds by 2050 (United Nations, 2014). While urbanization brings many benefits, it is linked with an increase in mental disorders, such as depression, anxiety, and schizophrenia (Akdeniz *et al.*, 2014, Haddad *et al.*, 2015, Peen *et al.*, 2010). The causal mechanisms for the link between urbanization and mental illness are not well understood, but a suggested explanation is the corresponding decrease in nature experiences, given the compelling evidence for nature experiences conferring psychological benefits. The extinction of experience represents a loss of opportunities, or affordances, for experiencing nature. We contend that urban designers and planners should give more priority to the embodied experiences of urban dwellers and the salutogenic affordances available to them, whilst also taking precaution to combat issues of environmental and procedural injustice. In this paper, we argued that direct experiences of urban nature can support mental health whilst also promoting biodiversity conservation. We are not suggesting that urban nature experiences will be a panacea for public health issues or combating biodiversity loss and climate change. Instead, we are making a modest claim that these experiences can be complemented with other nature-based solutions to promote public health and create sustainable cities.

References

- Akden Akdeniz, C., Tost, H. and Meyer-Lindenberg, A. (2014). The neurobiology of social environmental risk for schizophrenia: An evolving research field. *Social Psychiatry and Psychiatric Epidemiology* 49(4), 507-517.
- Antonovsky, A. (1996). The salutogenic model as a theory to guide health promotion. *Health Promot. Int.* 11, 11-18.
- Bauduceau, N., Berry, P., Cecchi, C., Elmqvist, T., Fernandez, M. and Hartig, T. (2015). Towards an EU Research and Innovation Policy Agenda for NatureBased Solutions & Re-Naturing Cities: Final Report of the Horizon 2020 Expert Group on 'Nature-Based Solutions and Re-Naturing Cities'. Brussels: European Commission.
- Chemero, A. (2009). *Radical Embodied Cognitive Science*. Cambridge, MA: MIT Press.
- Clayton, S., Colléony, A., Conversy, P., Maclouf, E., Martin, L., Torres, A.C., ... and Prévot, A.C. (2017). Transformation of experience: Toward a new relationship with nature. *Conservation letters*, 10(5), 645-651.
- Cohen-Shacham, E., Walters, G., Janzen, C. and Maginnis, S. (2016). Nature-based solutions to address global societal challenges. IUCN: Gland, Switzerland, 97, 2016-036.
- Gibson, J. J. (1979). *The ecological approach to visual perception*. Boston: Houghton Mifflin.
- Cosco, N.G. (2006). *Motivation to Move: Physical Activity Affordances in Preschool Play Areas*. Doctoral Dissertation, Edinburgh, Edinburgh College of Art.
- Dilani, A., 2009. *Psychosocially Supportive Design: A Salutogenic Approach to the Design of the Physical Environment*, 12.
- Franco, L.S., Shanahan, D.F. and Fuller, R.A. (2017). A review of the benefits of nature experiences: More than meets the eye. *International journal of environmental research and public health*, 14(8), 864.
- Frumkin, H., Bratman, G.N., Breslow, S.J., Cochran, B., Kahn Jr, P.H., Lawler, J.J., ... and Wood, S.A. (2017). Nature contact and human health: A research agenda. *Environmental health perspectives*, 125(7), 075001.
- Fuller, R.A., Irvine, K.N., Devine-Wright, P., Warren, P.H. and Gaston, K.J. (2007). Psychological benefits of greenspace increase with biodiversity. *Biology letters*, 3(4), 390-394.
- Gibson, J. (1979). *The Ecological Approach to Visual Perception*. Boston, MA: Houghton Mifflin.
- Grahn, P., Tenngrat Ivarsson, C., Stigsdotter, U. K. and Bengtsson, I. L. (2010). Using affordances as a health-promoting tool in a therapeutic garden. *Innovative approaches to researching landscape and health*, 1(5), 116-154.
- Haddad, L., Schafer, A., Streit, F., Lederbogen, F., Grimm, O., Wust, S., Deuschle, M., Kirsch, P., Tost, H. and Meyer-Lindenberg, A. (2015). Brain structure correlates of urban upbringing, an environmental risk factor for schizophrenia. *Schizophrenia Bulletin*, 41(1), 115-122
- Jennings, V., Larson, L. and Yun, J. (2016). Advancing sustainability through urban green space: Cultural ecosystem services, equity, and social determinants of health. *International Journal of environmental research and public health*, 13(2), 196.
- Kaplan, S. (1995). The restorative benefits of nature: Toward an integrative framework. *Journal of environmental psychology*, 15(3), 169-182.
- Kyttä, M. (2002). Affordances of children's environments in the context of cities, small towns, suburbs and rural villages in Finland and Belarus. *J. Environ. Psychol.* 22, 109-123. d
- Lin, J., Wang, Q. and Li, X. (2021). Socioeconomic and spatial inequalities of street tree abundance, species diversity, and size structure in New York City. *Landscape and Urban Planning*, 206, 103992.
- Myers, Z. (2019). *Wildness and Wellbeing: Nature, Neuroscience, and Urban Design*. Springer Nature.
- Marselle, M. R., Lindley, S.J., Cook, P.A. and Bonn, A. (2021). Biodiversity and health in the urban environment. *Current Environmental Health Reports*, 8(2), 146-156.
- Marselle, M.R., Martens, D., Dallimer, M. and Irvine, K.N. (2019). Review of the mental health and well-being benefits of biodiversity. In *Biodiversity and health in the face of climate change* (pp. 175-211). Springer, Cham.
- Olmsted, F.L. 1952. Yosemite and the Mariposa Grove: a preliminary report, 1865. *Landscape Architecture*. 43(1): 12-25.
- Peen, J., Schoevers, R.A., Beekman, A.T. and Dekker, J. (2010). The current status of urban-rural differences in psychiatric disorders. *Acta Psychiatr. Scand.* 121, 84-93. <https://doi.org/10.1111/j.1600-0447.2009.01438.x>
- Pyle, R. M. (1978). The extinction of experience. *Horticulture* 56, 64-67
- Ramstead, M.J., Veissière, S.P. and Kirmayer, L.J. (2016). Cultural affordances: Scaffolding local worlds through shared intentionality and regimes of attention. *Frontiers in psychology*, 7, 1090.

- Rigolon, A. (2016). A complex landscape of inequity in access to urban parks: A literature review. *Landscape and Urban Planning*, 153, 160-169.
- Shapiro, Lawrence and Shannon Spaulding, 'Embodied Cognition', *The Stanford Encyclopedia of Philosophy* (Winter 2021 Edition), Edward N. Zalta (ed.), Available at: <https://plato.stanford.edu/archives/win2021/entries/embodied-cognition/>.
- Soga, M. and Gaston, K.J. (2016). Extinction of experience: the loss of human-nature interactions. *Frontiers in Ecology and the Environment*, 14(2), 94-101.
- Spence, C. (2021). *Sensehacking: How to Use the Power of Your Senses for Happier, Healthier Living*. Penguin UK.
- Stoltz, J. and Schaffer, C. (2018). Salutogenic affordances and sustainability: Multiple benefits with edible forest gardens in urban green spaces. *Frontiers in Psychology*, 2344.
- Ulrich, R.S. (1984). View through a window may influence recovery from surgery. *Science*, 224(4647), 420-421.
- Ulrich, R.S., Simons, R.F., Losito, B.D., Fiorito, E., Miles, M.A. and Zelson, M. (1991). Stress recovery during exposure to natural and urban environments. *Journal of environmental psychology*, 11(3), 201-230.
- United Nations (2015). *World Urbanization Prospects: The 2014 Revision*, (ST/ESA/SER.A/366). Available at: <https://esa.un.org/unpd/wup/publications/files/wup2014-report.pdf> [accessed February 20, 2017].
- USDA (US Department of Agriculture, Forest Service). (2018). *Urban Nature for Human Health and Well-Being: A Research Summary for Communicating the Health Benefits of Urban Trees and Green Space*.
- Wen, Y., Yan, Q., Pan, Y., Gu, X. and Liu, Y. (2019). Medical empirical research on forest bathing (Shinrin-yoku): A systematic review. *Environmental health and preventive medicine*, 24(1), 1-21.
- Wolch, J.R., Byrne, J. and Newell, J.P. (2014). Urban green space, public health, and environmental justice: The challenge of making cities 'just green enough'. *Landscape and urban planning*, 125, 234-244.
- Zamani, Z. and Moore, R. (2013). The cognitive play behavior affordances of natural and manufactured elements within outdoor preschool settings. *Landsc. Res.* 1, 268-278.

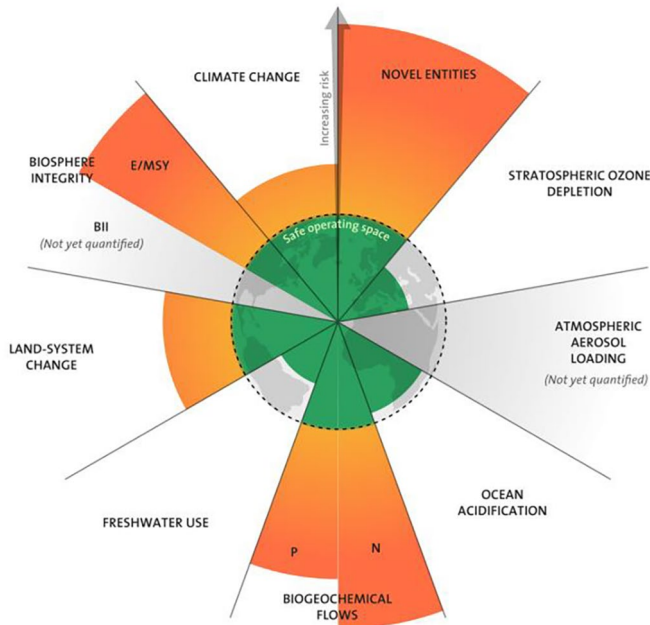


Figure 1. Planetary Boundaries (2022 Update, designed by Azote for Stockholm Resilience Centre, based on analysis in Persson *et al.*, 2022 and Steffen *et al.*, 2015).

Planetary boundaries framework

The concept

The PB framework identifies the ‘environmental preconditions’ for human development through nine ‘control variables’ that establish a safe operating space for humanity amid Earth-system processes (Rockström *et al.*, 2009a; Figure 1). The framework also came with a normative promise: the ‘freedom to pursue long-term social and economic development’ so long as the threshold values for key variables, such as for climate change and biodiversity, were not transgressed (Rockström *et al.*, 2009a, 475). Since being proposed, the PB framework has rapidly gained influence in global governance agendas, such as the SDG (e.g. Sachs, 2015; Hajer *et al.*, 2015). Key to the uptake of the framework is how it links the quantification of key variables to qualitative claims (such as those of freedom). This connection forms an important entry point for our work.

Our work treats the ‘control variables’ of the PB as proxy measures that frame the immense complexity of Earth’s biogeochemical processes in two normative senses. The first is with respect to narrative. In this sense, the PB framework provides a way to story relations of people to planet, principally in terms that both produce and explain the gap between ‘control variables’ and a ‘safe operating space for humanity’. The late ecologist, James Kay (2000, 135) described such efforts as those that put ‘scientists in the role of narrators’, who are then socio-politically placed to scope potential trade-offs and possible futures for decision makers. The second sense in which ‘control variables’ function normatively is collectively. In this sense, the nine PB together operate as a boundary object in the sense described by Star (2010) – they allow for interpretive flexibility, structure the pursuit and co-production of knowledge, and operate in ways that allow for (and arrange) cooperation across disciplines. Often, these two normative senses are

Section 2

combined in claims that it is necessary to 'think in systems' to identify leverage points for transforming planetary systems (Meadows, 1999, 2008).

Normative engagement

Here, we consider two previous normative uses of the PB. The first is characterised by efforts to complement the 'upper ceiling' of PB with a 'social floor.' Popularised by Kate Raworth (2017) as a 'doughnut' shaped arrangement of science, values, and a moral economy for the distribution of human impacts on the Earth system (Figure 2). Later attempts to operationalise the idea at existing scales of decision making (i.e. states), however, organised normative decisions hierarchically, with determinations of biophysical contexts and socio-economic concerns happening prior to ethical deliberation (Hayha *et al.*, 2016). A second normative attempt to employ the PB framework arose in international law, where the framework was proposed as a *grundnorm* – that is, a norm that comes logically and empirically prior to, and operates in hierarchical fashion over, others. Kim and Bosselmann (2015) argued that the environmental preconditions identified through the PB framework satisfy the logical and empirical demands to be a *grundnorm* for international agreements on the argument that it is irrational to undermine the conditions for existence.

Despite the power of the normative uses of the PB frameworks above there have been significant critiques. Schmidt (2019) notes that delaying ethical deliberation until after biophysical and economic concerns are 'settled' ignores the role of ethics in those activities (Benessia *et al.*, 2012; Meisch, 2019). Further, positing a *grundnorm* as hierarchically justified through the PB framework ignores the important non-linear and cross scalar dynamics of the Earth system (Schmidt, 2019). Other critiques target the PB framework itself; Biermann and Kim (2020) argue that it prioritises epistemic practices of the Global North and, indeed, shrouds the ethical worlds of those scientific communities of practice behind a putatively authoritative claim to have determined a 'safe operating space' for all humanity.

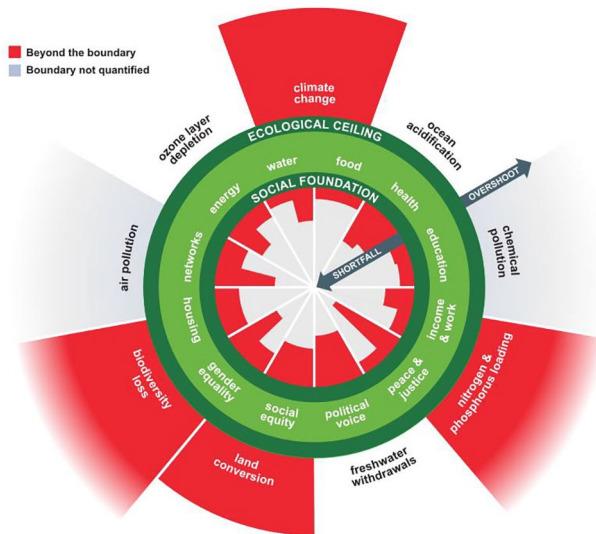


Figure 2. The Doughnut of social and planetary boundaries (2017) (Doughnut Economics Action Lab, Creative Commons BY SA 4.0 license).

The ongoing project 'Earth System Ethics: Unravelling the Planetary Boundaries'

The project

The two-year project is a collaboration between Jeremy Schmidt (University of Durham) and Simon Meisch (University of Tübingen) and funded by the *Tübingen-Durham Seedcorn Fund*. It was planned at the outset of the COVID-19 pandemic and is digital only. Hence, it uses to its advantage tools and practices established during the pandemic to engage in a global dialogue.

The goal of the project is to provide the first sustained engagement from the social sciences and humanities into the normative dimensions of the PB framework and thus lay the foundation for an Earth system ethics. The core research area lies at the intersection where geography and practical philosophy converge on concerns regarding the unequal processes through which humans are altering the Earth and how those impacts are known and governed. Our aim is to examine connections among sciences and societies; complex and often violent histories that underpin accelerating human impacts on the planet; and the obligations at stake in discussions of competing futures.

The project has four mutually supporting activities. The first is a series of nine dialogues among Earth science, social science, and humanities scholars on the PB. Each conversation consists of two experts and us, the authors of this paper. As project members, we facilitate and record the dialogues. We selected experts that have previously shown a normative concern with (at least) one of the topics addressed in the PB framework. Pairs were matched so that they represent different but complementary experiences (e.g. disciplinary, regional, gender etc.). Dialogues were designed to explore the moral ecologies through which different scholars approach, and engage with, the PB framework; so, the conversations are not seeking generalisable results. Second, the meetings are held on zoom and recorded. Later, audio file will be used for podcasts. Third, conversation partners will write a short paper each that will be assembled in an open-access book. Fourth, this all will build up in the application for a research grant.

Regarding our understanding of ethics, we took two basic decisions. First, from the beginning, we expected that ethical dimensions of the PB are approached in multifaceted ways, and we aimed to be open to a diversity of perspectives. As such, we kept a broad understanding of ethics that highlights how different ways of identifying matters of concern, and of evidencing and supporting arguments regarding those concerns, are central to thinking critically about the PB in dialogues across disciplines. Second, ethical considerations are pressing concerns in interdisciplinary fields of human-environment studies; yet, there is no systematic appraisal of concerns regarding the use of the PB framework in global policy. More often, there is contest and divergence owing to differences over how histories of colonialism, globalization, and power affect the production of knowledge about the Earth and to what ends. Thus, a key commitment of our project is to amplify voices often marginalized in these discussions and to accord dialogic parity to different disciplinary orientations. So, the project is built on principles of equity, diversity, and inclusion. It did its best to include scholars of diverse gender orientations, race, ethnicity, region, and religion across the sciences, social sciences, and humanities. Our aim is to expand our partnerships in the pursuit of the grant initiative so that our project operates in an ethos of respect and engagement.

Methodological decisions

The design of the conversations builds on three main methodological decisions.

First, we see the PB framework as a *boundary object* (Star, 2010), i.e. as something that has great 'interpretative flexibility'. As such, it serves as a discursive reference point for discussants coming from

Section 2

different communities of practice, enabling them to collaborate ‘in the absence of consensus’ (*ibid.*, 604). This approach allows us to present the PB framework to participants in the dialogues as a ‘basis for communication’ or a ‘good communication device’, even in those cases when participants deem the framework an inadequate representation of reality (*ibid.*, 608). In addition, there is another aspect that makes the boundary objects concept interesting for our project. For in the process of establishing standards such as the PB framework, categories of ‘the Other’ emerge, which are not part of this standard, and which as such can become a new boundary object (Star, 2010, 613-615). So, it will be an interesting methodological question for the *Earth System Ethics* project if, and how, an ethics of PB can become such a reference point where essential issues of societal relationships to nature or socio-natures in the Anthropocene are negotiated.

Second, in unravelling the PB framework, we refer to Eugene Garver’s idea of ‘essentially contested arguments’ which he in turn introduced to make sense of Walter Gallie’s ‘essentially contested concepts’, i.e. ‘concepts which are essentially contested, concepts the proper use of which inevitably involves endless disputes about their proper uses on the part of their users’ (Gallie, 1955-56, 169). Now, according to Garver, such concepts

‘are composed of essentially contested arguments. For if the meaning of a term is made of the opinions, values, and referents that people give to the term, those opinions, values, and referents are at the same time the material for arguments about the concepts, and are the products of these arguments.’ (Garver, 1978, 164)

For Garver, the ideal of an ‘essentially contested argument’

‘[...] is to construct not an invulnerable argument but the best argument possible in a particular situation’ (Garver, 1978, 159);

‘[...] is not to silence the opposition forever but to take the opinion of one audience in one situation and make those opinion lead, as best as one can, to a particular verdict’ (*ibid.*);

‘[...]keeps] the controversy centered on the arguments themselves’ (*ibid.*).

Looking at the PB framework, we can clearly see how it is essentially contested (e.g. Kim and Biermann, 2020). In the project, we take up the argumentative and dialogical impulse of Garver’s idea. This way, we aim to unveil with our conversation partners the ‘opinions, values, and referents’ regarding the framework and discuss its implications for particular contexts.

Third and consistent with the previous decisions, the conversations in the *Earth System Ethics* project are meant to ‘increase complexity’ (Stirling, 2010), i.e. open a wide field of ethical reflection on the PB framework. This way, the project intentionally avoids the impression that it is achievable or even desirable to manufacture an ethical consensus. So, the project’s approach counteracts narrow framings, for example by allowing a field’s complexity to shine through, as with the novel entities and ‘chemosociality in multispecies worlds’ (Kirksey, 2020) or by reintroducing excluded complex socio-economic perspectives, as with the boundary on land use and the global agriculture and food sector.

Initial results

In the beginning of March 2022, we have held six of nine conversations, and are thus only able to present initial results. At this stage, we are already witnessing common themes five of which we want to mention as we believe they are relevant for agriculture and food production:

Conversation partners emphasise the relevance of narrations to better understand and make tangible the evaluative and normative issues related to the often-abstract topics the PB framework deals with. Such narratives revolve around an endangered bird, the place of origin of the phosphorus in one's own bones or processes of land grab and displacement.

The conversation touched on tensions and contradictions between different ontologies and cosmologies, and how to address them. Such contradictions are always present, when for instance scientific forms of knowledge clash with other ways of knowing. In the case of indigenous knowledge, they are particularly manifest as further questions of epistemic justice arise, as was especially evident in the conversation about the water boundary.

There are the universalising tendencies of the PB framework, such as the planetary focus but also its notion of the *one* humanity. In contrast, many conversation partners mentioned context and relations. Problems such as biodiversity loss or land use change are about the concrete spaces specific people want to inhabit and cultivate and the relations, they wish to have with the non-human world in them. So, debates touched on different ethics of good live and of care.

Related to this, dialogues dealt with ambiguities around scales. There are many tensions between global economic processes and their local consequences, e.g. with land grab in Africa or phosphate mining in the Pacific. A variety of processes of exploitation, the damaging effects on local communities, and injustices came to the fore. However, what also became apparent are processes of self-empowerment of local marginal groups.

The PB framework is a story itself – about a safe space for humanity in the Anthropocene. It focusses on some environmental issues but not on others. So, conversations dealt with the questions of how the framework narratively structures problems and how this framing requires ethical reflections (on narrative ethics cf. Meisch, 2019). Dialogue partner also addressed tensions between the public attention of a problem and its contradictions to the PB framework, e.g. pollution of oceans with (micro-) plastic and ocean acidification.

Conclusions

The project *Earth System Ethics* is organising a series of conversations to raise ethical issues of the PB framework. In this paper, we report on the project's approach and initial insights (after more than half of the dialogues have been held). It has become apparent that our approach is able to reveal a diverse and complex picture of ethical issues around the PB framework. Together with our dialogue partners, we discuss ethical issues arising regarding one boundary or from the relationship of several boundaries. Moreover, we also deliberate ethical challenges resulting from the ways the framework structures the debate about future problems of people worldwide. So far, it has been an exciting ethical experiment and adventure for us as well as our dialogue partners.

Acknowledgements

We acknowledge funding of the Tübingen-Durham Seedcorn Fund.

References

- Benessia, A. *et al.* (2012). Hybridizing sustainability: towards a new praxis for the present human predicament. *Sustainability Science* 7 (Supplement 1): 75-89.

Section 2

- Biermann, F and Kim, R.E. (2020). The Boundaries of the Planetary Boundary Framework: A Critical Appraisal of Approaches to Define a 'Safe Operating Space' for Humanity. *Annual Review of Environment and Resources* 45: 497-521.
- Garver, E. (1978). Rhetoric and Essentially Contested Arguments. *Philosophy & Rhetoric* 11(3): 156-172.
- Hajer, M. *et al.* (2015). Beyond Cockpit-ism: Four Insights to Enhance the Transformative Potential of the Sustainable Development Goals. *Sustainability* 7(2): 1651-1660.
- Häyhä, T. *et al.* (2016). From planetary boundaries to national fair shares of the global safe operating space – how can the scales be bridged? *Global Environmental Change* 40: 60-72.
- Gallie, W.B. (1955-56). Essentially Contested Concepts. *Proceedings of the Aristotelian Society* 56: 167-198.
- Garver, E. (1978). Rhetoric and Essentially Contested Concepts. *Philosophy & Rhetoric* 11(3): 156-172.
- Kay, J. (2000). Ecosystems as self-organizing holarchic open systems: narratives and the second law of thermodynamics. In: Jørgensen, S. and Müller, F. (eds). *Handbook of ecosystem theories and management*. Boca Raton: Lewis Publishers, pp. 135-160.
- Kim, R. and Bosselmann, K. (2015). Operationalizing sustainable development: ecological integrity as a grundnorm of international law. *RECIEL* 24(2): 194-208.
- Kirksey, E. (2020). Chemosociality in Multispecies Worlds. *Endangered Frogs and Toxic Possibilities in Sydney*. *Environmental Humanities* 12(1): 23-50.
- Meadows, D. (1999). *Leverage points: places to intervene in a system*. Hartland: The Sustainability Institute.
- Meisch, S. (2019). I Want to Tell You a Story: How Narrative Water Ethics Contributes to Re-theorizing Water Politics. *Water* 11(4), 631; <https://doi.org/10.3390/w11040631>.
- Persson, L. *et al.* (2022). Outside the Safe Operating Space of the Planetary Boundary for Novel Entities. *Environmental Science & Technology* 56(3): 1510-1521.
- Raworth, K. (2017). *Doughnut economics: seven ways to think like a 21st-century economist*. New York: Random House.
- Rockström, J. *et al.* (2009a). A safe operating space for humanity. *Nature* 461: 472-475.
- Rockström, J. *et al.* (2009b). Planetary boundaries: Exploring the safe operating space for humanity. *Ecology and Society* 14(2): 32.
- Sachs, J. (2015). *The age of sustainable development*. New York: Columbia University Press.
- Schmidt, J.J. (2019). The moral geography of the Earth system. *Transactions of the Institute of British Geographers* 44(4): 721-734.
- Star, S.L. (2010). This is Not a Boundary Object: Reflections on the Origin of a Concept. *Science, Technology, & Human Values* 35(5): 601-617.
- Steffen, W. *et al.* (2015). Planetary boundaries: Guiding human development on a changing planet. *Science* 347(6223).
- Stirling, A. (2010). Keep it complex. *Nature* 468: 1029-1031.

21. Farming with nature: lessons from rewilding agriculture and *Paysans de nature*

A. Mondière^{1*}, V. Thomas², M.S. Corson¹, M. Diraison³, P. Dulac³, D. Siguier³ and H.M.G. van der Werf³
¹INRAE, Institut Agro, SAS, Rennes, France; ²Centre for Rural Policy Research, University of Exeter, Exeter, United Kingdom; ³Paysans de Nature, Beauvoir sur Mer, France; aymeric.mondiere@inrae.fr

Abstract

Rewilding is a multifaceted concept, with distinct interpretations depending on its geographical location. A form of domesticated English rewilding is emerging; compared to rewilding at other locations, it operates at smaller spatial scales; has somewhat lower ambitions for increasing biodiversity, restoring ecosystem functioning and favouring natural functioning; and involves more human intervention (Thomas, 2021). More generally, agricultural rewilding is an emerging form of land use conceptually positioned between agroecology and rewilding (Mondière *et al.*, 2021). It combines restoration of ecological processes with some degree of agricultural production, most often of animals. In parallel, the French *Paysans de nature*[®] network federates farmers whose main objective is to conserve and restore natural environments while producing food in an economically viable way (Paysans de nature, 2021). Domesticated English rewilding and agricultural rewilding largely correspond to the same type of land use, perceived from different angles. In comparison, the *Paysans de nature* approach aims to reconcile agricultural production and wildlife in all its forms. These approaches, which currently concern relatively small areas, may provide multifunctional models for the transition of livestock farms to respond better to societal demands, in particular for restoration of biodiversity in agricultural landscapes. We performed a SWOT (strengths, weaknesses, opportunities, threats) analysis of environmental, social, and economic characteristics of the two approaches. We conclude by summarizing our view of the potential of both.

Keywords: agricultural rewilding, domesticated rewilding, biodiversity, restoration

Decline of biodiversity and how agriculture has largely driven it

Among the causes of the global decline of biodiversity, agriculture is considered to have the strongest impact (Tscharntke *et al.*, 2005). The current main agricultural model, based on intensifying production, is responsible for most direct impact on biodiversity (Chappell and LaValle, 2011). Intensification simplifies and homogenises agricultural landscapes and crop rotations, and increases mechanisation and the use of chemical inputs (fertilisers and pesticides) which impacts biodiversity directly at the field and landscape scales. Another direct impact is the expansion of intensive agricultural systems into natural ecosystems (Tscharntke *et al.*, 2005). Indirect impacts on biodiversity are related to a decrease in ecosystem quality, for example due to greenhouse gas emissions (Alejandre *et al.*, 2019). Current reflection has highlighted the potential of agroecological systems, which are based more on ecological processes than on external inputs (e.g. 'biodiversity-based systems'), to address this (Therond *et al.*, 2017). As these processes depend on biodiversity in the agroecosystem, transitioning from a system based on external inputs to an agroecological system can increase on-farm biodiversity, especially that which supports agricultural production, and this biodiversity can be managed on the farm with a landscape approach (Duru *et al.*, 2015). Some concepts, such as 'agricultural rewilding'; and the approach of the French farmers' network *Paysans de nature*, go even further by considering biodiversity restoration as the main goal of an agroecological system.

The emergence of agricultural rewilding in England

A form of ecological restoration consistent with the principles of rewilding has been present in Britain for ca. 40 years (Taylor, 2011). The term itself, however, was adopted much more recently, and the rewilding discourse in Britain is distinct from that in the USA, where the concept first appeared and where its original principles were developed (Lorimer *et al.*, 2015). Indeed, rewilding in Britain developed independently, in a context 'appropriate to a crowded island, rather than a continental scale' (Taylor, 2011, p. 14). This context, so pertinent to rewilding in Britain, influences its trajectory significantly. Given Britain's dense population and long history of human habitation, its landscapes are intensely cultural, especially *agricultural* (Sandom and Macdonald, 2015): any rewilding project needs to operate within this landscape. In addition, Britain's island geography prevents many extirpated species from 'auto-rewilding' (Clancy and Ward, 2020), thus requiring human intervention to reintroduce them. The need for compatibility with cultural land use and for human involvement is 'domesticating' rewilding in England (Thomas, 2021), by: (1) operating at smaller scales than those in other countries (e.g. farm scale); (2) permitting active human interaction (e.g. extensive cattle grazing); (3) limiting which species are reintroduced (e.g. domestic livestock substitute their wild counterparts); and (4) restricting the other-than-human agency involved in rewilding (by continuing human management). Because of these adaptations, 'agricultural rewilding' is emerging, a form of land use which combines restoration of ecological processes with a degree of agricultural production and is therefore conceptually positioned between agroecology and the original rewilding concept (Mondière *et al.*, 2021). Agricultural rewilding is more compatible with the social and environmental geographies of England than other forms of rewilding.

The emergence of *Paysans de nature* in France

Paysans de nature (PdN), an association formed to combine biodiversity restoration and agricultural production, developed in France at the regional scale, and then expanded to the national scale in the past decade (Paysans de nature, 2021). PdN is a network of farmers who are committed to the charter that it created. It promotes agreements with local stakeholders (which help to spread the PdN vision) and the PdN brand. It currently manages more than 5,000 ha through its members. By signing the charter, farmers commit to manage their farm as a 'natural farming reserve'. Local associations and/or stakeholders can also commit to perform actions that help spread the PdN vision (e.g. host interns, organise events). The PdN network includes neighbouring stakeholders around each farm in an audit to validate (or not) the farm's PdN status. This audit, based on biodiversity issues identified by managers of local natural areas, aims to adapt the farm's management to its natural context. Thus, the PdN approach creates a social-ecological system that increases harmony among society (farmers and other local stakeholders), farm practices, and nature. It stresses the importance of on-farm biodiversity while maintaining a human presence in rewilded areas, with 'soft' management and a philosophy that enhances the rewilding. PdN farmers differ from other emerging agricultural trends by: (1) considering themselves as part of a community of other living beings; (2) valuing the wildlife on their farms by considering that all species have a place; and (3) learning about the biodiversity on their farms to consider it in their farm management. They are located in a variety of agroecosystems in France but are more common where a certain level of biodiversity is present (e.g. mountains, bocage) than in intensive agroecosystems (e.g. landscapes of cereal fields).

Comparing agricultural rewilding to the vision of *Paysans de nature*

Analysis of projects/farms that apply the two approaches

We analysed two agricultural rewilding projects (in England) and two PdN farms (in France) that apply these approaches in order to identify their overall characteristics and highlight similarities and

differences (Table 1). While the scale of the two agricultural rewilding projects is smaller than that of traditional rewilding projects, each remains relatively large: a large farm (450 ha for the south block of Knepp Wildland) or a small landscape (4402 ha for Wild Ennerdale). Knepp Wildland was initiated on a failing private crop-livestock farm, whereas Wild Ennerdale was initiated in a national park, where biodiversity conservation was already an important issue. Active rewilding in both projects included introducing domesticated ecosystem engineers adapted to the local ecosystem, such as cattle, which contribute to meat production. Each also hosts wild species, which are often specific to the local ecosystem (e.g. purple emperor butterfly, freshwater mussel) and sometimes reintroduced (e.g. white stork). Other actions to enhance rewilding include managing the domesticated species (e.g. harvesting livestock, monitoring calving), habitat restoration, and extensive grazing. Social interactions (e.g. volunteers) and economic activities (e.g. meat production, education) focus on the main objective of restoring ecosystem functioning.

The two farms that illustrate the PdN approach differ greatly (Table 1). Grand Laval is a small crop-livestock farm with diversified production (i.e. crops, fruit, sheep meat, eggs), and much of its land is arable, whereas La Barge is a larger beef farm mostly in permanent grassland. Both manage many domesticated animal or plant species adapted (e.g. Maraichine cow) or not to their natural context, with the main objectives of agricultural production and high on-farm biodiversity. Many management practices are performed to restore ecosystem functioning (e.g. creating ponds) and/or enhance on-farm biodiversity (e.g. flower strips). These farms influence the local community by selling their products directly, engaging volunteers, and/or organising nature walks and cultural events. Their income is related directly to their agricultural production, with no other sources of income.

Similarities and differences of the two approaches

Considering the previous analysis and literature on agricultural rewilding and PdN in a brainstorming session, the co-authors identified similarities and differences in their characteristics and effectiveness (Table 2). Despite having different origins, as well as contexts and scales of application, they have the same main objective of restoring ecosystem functioning while considering other socio-economic objectives by applying some human intervention.

Agricultural rewilding projects are set up by private or governmental stakeholders in large areas, and not necessarily in an agricultural context (e.g. protected area, abandoned farm). They are set up in a wide variety of soil and climate contexts. While they are not formally organised into a single network, they generally follow similar techniques (i.e. restoring ecosystems by introducing large herbivores). In comparison, PdN are private farms supported by local associations and a national network. They have diversified types of production (usually including livestock), which provides multiple opportunities to restore ecosystem functioning.

Although both aim to restore biodiversity, their main objectives differ. Agricultural rewilding projects focus on ecosystem restoration, with less emphasis on agricultural production and income, or integration into the local community. In contrast, PdN farms aim to balance ecosystem restoration, food production, farm income, and integration into the local community.

Agricultural rewilding projects are not formally organised and have no single set of guidelines, which leads to a wide variety of management practices, albeit always with little human intervention and some side activities (e.g. tourism, agricultural production). In contrast, PdN farms have a shared commitment within a national network, which helps them achieve their objective. Although their 'low-input' practices help enhance biodiversity, they have more human intervention than agricultural rewilding projects do, especially on mixed crop-livestock farms. Although both approaches aim to restore ecosystem

Section 2

Table 1. Characteristics of two typical agricultural rewilding projects and Paysans de nature farms. (Sources: websites for Rewilding Britain, Grand Laval, and La Barge).

Approach	Project or farm, start year, area, management ¹	Description and county/ departement	Key species		Actions to enhance rewilding	Engaging people	Economic activities
			Domestic	Wild			
Agricultural rewilding	South block of Knepp Wildland, 2001, 450 ha, P	Failing farm land turned into a site of wildlife abundance (Sussex, UK)	Tamworth pig, Exmoor pony, long-horn cattle	Eurasian beaver, 3 deer species, purple emperor butterfly, white stork	Extensive grazing, habitat restoration, species reintroduction, domestic animal regulation	Volunteering	Recreation, business rentals, education programmes, animal production
	Wild Ennerdale, 2003, 4402 ha, G-P-N	Rewilding in the Lake District National Park (Cumbria, UK)	Galloway cattle	Roe deer, red deer, red squirrel, aquatic wildlife	Extensive grazing, habitat restoration, tree planting, deer control	Volunteering, stakeholder coordination, community hub	Animal production
Paysans de nature	La ferme du Grand Laval, 2006, 25 ha, P-N	Diversified organic farm that fully integrates wildlife (Drôme, France)	Ewe, chicken, fruit crops, vegetables, diversified arable crops	Birds, bats, small mammals	Nesting boxes, hedges, grass and flowering strips, mulching, growing nectar sources	Volunteering, direct selling on-farm	Production of eggs, fruit, vegetables, pulses, oils, apple juice, lamb meat
	GAEC La Barge, 2006, 171 ha, P-N	Farm raising cows on natural meadows to produce quality meat while preserving biodiversity (Vendée, France)	Maraichine beef cow, horses, other domestic local species, arable crops	Amphibians, endemic marsh birds, other bird species	Flooding meadows, creating ponds, extensive grazing, reducing mechanisation, increasing grazing/ mowing rate	Volunteering, direct selling on-farm, cultural events on-farm, markets, nature walks	Meat production

¹G = governmental; N = non-governmental organisation; P = private.

Table 2. Characteristics (Char.) of agricultural rewilding and *Paysans de nature*.

Char.	Agricultural rewilding	<i>Paysans de nature</i>
Premise	Grazers and other animal ecosystem engineers can transform marginal farmland and/or other area into a biodiverse ecosystem, which allows for some harvest. The main objective is restoration of ecosystem functioning.	Farms managed as 'natural farming reserves' to conserve and restore natural environments, enhance biodiversity, feed citizens, and provide farmers with income. Establishing <i>Paysans de nature</i> in an area protects its wildlife more effectively than traditional regulations do.
System	Large areas where a diverse mixture of herbivores and sometimes pigs are managed to develop self-sustaining ecosystems, which restores native biodiversity and ecological processes. Human intervention varies among projects, and agricultural production is limited.	A variety of farm types, often combining crops and livestock, often organic, and often with on-farm processing, producing mainly for local markets. Organised in networks, with commitment to a common charter.
Rewilding	Introduction and regular harvest of traditional livestock and wild herbivores, habitat restoration, tree planting	Habitat restoration, tree planting
Agricultural	Extensive grazing	Use of traditional plant varieties and animal breeds, low input levels, no synthetic chemical products, farming practices compatible with preservation of biodiversity
Economic	Agricultural production combined with other income sources (e.g. tourism)	Agricultural production as the only source of income
Social	Different types of stakeholders lead the projects, whose objectives vary	Farmers turn to other stakeholders to share their vision of agriculture, biodiversity restoration, and relations between them

functioning, their differences require thinking carefully about what actions are needed to encourage them to expand and ultimately to promote this aim via systems that supply food from the wild.

SWOT of the two approaches to identify how to facilitate their expansion

We performed a SWOT (strengths, weaknesses, opportunities, and threats) analysis, based on individual assessments by each co-author, of agricultural rewilding and PdN to identify characteristics that can be used to promote them and decrease the risk that they will fail (Table 3). Strengths common to the two approaches include combining high-quality food production with enhancing ecosystem functioning/biodiversity, and having a good image (and, for PdN, attractiveness to potential members). Agricultural rewilding is also strong by diversifying income to include nature-based sources, its appeal to a variety of stakeholders, and combination of social and environmental benefits. PdN is also strong by having a network with a specific charter at the agriculture-environment interface, application at the farm scale, self-sufficiency, farming income, and being a proof of concept that agricultural production and wildlife can coexist.

However, the compromise of agricultural rewilding can also create weaknesses, such as restoring ecosystems less effectively than rewilding does and requiring a relatively large area (even at the farm scale), but which may not be large enough to support certain species. Other weaknesses include its broad definition, the suffix 're-' in the term itself, and a need for rewilding mind-set and skills to understand such projects well. For PdN, weaknesses include difficulties engaging with stakeholders besides naturalists and

Section 2

Table 3. SWOT of the two approaches. (-): number of co-authors who mentioned the item

	Agricultural rewilding (AR) (4 experts)	Paysans de nature (5 experts)
S	<ul style="list-style-type: none"> (4) High-quality and sustainable meat production along with restoration of ecosystem functioning (2) New nature-based economies by diversifying income sources (1) Applicable at multiple scales and to different regions (1) Appeals to a range of stakeholders (1) Good public image (1) A compromise concept that delivers social and environmental benefits 	<ul style="list-style-type: none"> (5) Network of farmers and local citizens with a common commitment to enhance biodiversity (3) Interface between agriculture and the environment (2) Feasible on a farm-sized area (2) Good public image and attractiveness to potential members (1) Farming income (1) High-quality food production (1) Self-sufficiency (1) Proof of concept of the coexistence of farming and wildlife (2) Only one source of income (2) Difficult to engage with stakeholders besides naturalists and farm experts (1) Modest income (1) No assessment of the degree of biodiversity restoration (1) Expectations and enthusiasm exceed the network's capacity to handle them (1) Exporting this national network may be challenging (1) Increased complexity of farm management
W	<ul style="list-style-type: none"> (2) Broad definition with no clear limits (2) Restores ecosystems less effectively than rewilding (1) The 're-' in the term itself may be perceived as threatening (1) Requires a relatively large area, even at the farm scale (1) Requires a rewilding mind-set and skills (1) Area may be too small to support certain species 	<ul style="list-style-type: none"> (1) Environmental issues are currently high on the public agenda (3) Former conventional farming areas becoming available due to many farmers retiring or quitting (1) Nature-based tourism (1) Aspiring naturalist farmers (2) Scepticism of rural populations (2) Lack of aspiring livestock farmers (2) Partnership and consumption reserved for the most fervent supporters (1) Conflicts with the dominant agricultural model
O	<ul style="list-style-type: none"> (3) New agricultural subsidy rules and business opportunities may favour AR (2) Appealing for farmers and scientists interested in agroecology (1) Potential 'win-win' approach (1) Potential for nature-based tourism 	<ul style="list-style-type: none"> (5) Environmental issues are currently high on the public agenda (3) Former conventional farming areas becoming available due to many farmers retiring or quitting (1) Nature-based tourism (1) Aspiring naturalist farmers (2) Scepticism of rural populations (2) Lack of aspiring livestock farmers (2) Partnership and consumption reserved for the most fervent supporters (1) Conflicts with the dominant agricultural model
T	<ul style="list-style-type: none"> (4) Scepticism of rural populations and ecologists (2) Trade-offs between food self-sufficiency and nature preservation (1) Economic viability in a competitive context (1) Shifts away from meat consumption (1) Potential 'lose-lose' approach 	<ul style="list-style-type: none"> (5) Environmental issues are currently high on the public agenda (3) Former conventional farming areas becoming available due to many farmers retiring or quitting (1) Nature-based tourism (1) Aspiring naturalist farmers (2) Scepticism of rural populations (2) Lack of aspiring livestock farmers (2) Partnership and consumption reserved for the most fervent supporters (1) Conflicts with the dominant agricultural model

farm experts, expectations and enthusiasm that exceed the network's capacity to handle them, difficulty 'exporting' the concept abroad, a single modest source of income, more complex farm management, and no assessment of how much the farm has contributed to enhancing biodiversity. Opportunities common to the two approaches include growing public awareness of environmental issues, the potential for new subsidies or investments, the interest of farmers or scientists in agroecology, the interest of naturalists in farming, and public interest in nature-based tourism. Another opportunity for agricultural rewilding is its potential 'win-win' approach (ecosystem restoration and meat production). Another opportunity for the PdN approach is the current trend of 'agricultural decline', which provides the potential to establish new PdN farms on former conventional farming areas. Both approaches can be threatened by external factors such as scepticism of rural populations (but also of ecologists, for agricultural rewilding). Agricultural rewilding could also be considered a 'lose-lose' approach (not enough ecosystem restoration or meat production) and could compete with food production in a context of global food insecurity or be shunned by consumers shifting away from meat consumption. For PdN, other threats include not

being able to expand support beyond a small group of fervent citizens, conflicting with the dominant agricultural model, and lacking enough aspiring livestock farmers.

In summary, both approaches have a good public image and future economic opportunities (subsidies or investments) due to high environmental awareness at present, but they need to demonstrate their benefits to rural populations to be accepted more widely. Agricultural rewilding needs to be defined more precisely to increase understanding, and it would benefit from the development of general guidelines. However, each project needs to pay attention to trade-offs between nature conservation and food production in its given context. In comparison, PdN can remain based on its network, high-quality products, and newly available farm areas while maintaining acceptable income for farmers. However, it needs to pay attention on how to expand in relation to the dominant agricultural model and attract more livestock farmers.

References

- Alejandre, E.M., van Bodegom, P.M. and Guinée, J.B. (2019). Towards an optimal coverage of ecosystem services in LCA. *Journal of Cleaner Production* 231: 714-722.
- Benton, T.G., Vickery, J.A., Wilson, J.D. (2003). Farmland biodiversity: is habitat heterogeneity the key? *Trends in Ecology and Evolution* 18: 182-188.
- Chappell M. J. and LaValle L. A. (2011). Food security and biodiversity: can we have both? An agroecological analysis. *Agriculture and Human Values* 28: 3-26.
- Clancy, C. and Ward, K. (2020). Auto-rewilding in Post-industrial Cities: The Case of Inland Cormorants in Urban Britain. *Conservation and Society* 18: 126-136.
- Duru, M., Therond, O., Martin, G., Martin-Clouaire, R., Magne, M.A., Justes, E., Journet, E.P., Aubertot, J.N., Savary, S., Bergez, J.E. and Sarthou, J.P. (2015). How to implement biodiversity-based agriculture to enhance ecosystem services: a review. *Agronomy for Sustainable Development* 35: 1259-128.
- Lorimer, J., Sandom, C., Jepson, P., Doughty, C., Barua, M. and Kirby, K. (2015). Rewilding: science, practice, and politics. *Annual Review of Environment and Resources* 40: 39-62.
- Mondière A., Corson, M.S., Morel, L. and van der Werf, H.M.G. (2021). Agricultural rewilding: a prospect for livestock systems. *EcoEvoRxiv* doi: 10.32942/osf.io/mv6dn.
- Paysans de nature (2021). Charte des paysans de nature. Available at: <https://www.paysansdenature.fr/wp-content/uploads/2021/12/charte-des-paysans-de-nature.pdf>. Accessed 25 February 2021.
- Sandom, C.J. and Macdonald, D.W. (2015). What next? Rewilding as a radical future for the British countryside. In: Macdonald, D.W. and Feber, R.E. (eds) *Wildlife conservation on farmland volume 1: Managing for nature on lowland farms*. Oxford University Press, pp. 291-316.
- Taylor, P. (ed.) (2011). *Rewilding: ECOS writing on wildland and conservation values*. Ethos, Walton Hill, UK, 491 pp.
- Therond, O., Duru, M., Roger-Estrade, J. and Richard, G. (2017). A new analytical framework of farming system and agriculture model diversities. A review. *Agronomy for Sustainable Development* 37.
- Thomas V. (2021). Domesticating rewilding: interpreting rewilding in England's green and pleasant land. *Environmental Values* doi: 10.3197/096327121X16328186623841.
- Tscharntke, T., Klein, A.M., Kruess, A., Steffan-Dewenter, I. and Thies, C. (2005). Landscape perspectives on agricultural intensification and biodiversity – ecosystem service management. *Ecology Letters* 8: 857-874.

22. Rewilding identity foodscapes: moral challenges from a multi-species justice perspective

C. Moyano-Fernández

Institute of Philosophy, CSIC, C. de Albasanz, 26, 28037 Madrid, Spain; cristian.moyfe@gmail.com

Abstract

What moral challenges may arise when attempting to implement rewilding in foodscapes, assuming that the concern for feeding a specific population is conditioned by the cultural and historical traditions of the territory in question? This identity conditionality of food often affects preservation of the local fauna. I have therefore chosen to analyse the moral conflicts that arise from this triple tension between food-wildlife-identity values. The perspective I have adopted is framed within a multispecies justice approach. According to the different foodscape scenarios and based on the methodologies of rewilding, I highlight two groups of challenges: (1) Passive rewilding in industrial scenarios. Domesticated or hunted animals which have an identity value associated with food are likely to generate conflict with the practice of passive rewilding. By way of example, I refer to pigs in Catalonia. The key issue here is not how food is provided, but how food production hinders rewilding initiatives. (2) Active and trophic rewilding in semi-domesticated scenarios. Semi-wild animals which have an identity value associated with food are likely to generate a moral tension between passive and active rewilding. As a case study, I analyse the role played by reindeer in Lapland. Here, wild food may block active rewilding initiatives based on the trophic reintroduction of apex predators. In mapping these tensions that arise when addressing the question of whether to reproduce or preserve certain species, I have found that food identity represents a leverage point in some rewilding decision-making. By way of conclusion, I propose that foodscape identity should be subjected to ethical scrutiny supported by multispecies justice, especially when seeking to review the trade-offs of regenerating ecosystem integrity.

Keywords: identity, food, wildlife, ecosystems, ethics

Introduction

The main objective pursued in this work is to explore the moral pitfalls that may arise from the viewpoint of multispecies justice when seeking to apply rewilding in different foodscapes. To this end, a clarification of key terms is required. I will therefore begin with a brief presentation of the concepts of ‘rewilding’, ‘foodscape’, ‘identity’ and ‘multispecies justice’.

Firstly, rewilding is an approach derived from conservation biology and ecology, consisting of regenerating ecological functions to enable ecosystem self-management. A broad array of meanings and methodologies can be found within this main definition, from more proactive ones based on translocations, to more humble ones based on anthropogenic abandonment (Pettorelli *et al.*, 2019). This plurality when it comes to understanding rewilding may be a consequence of particular ecological circumstances and cultural values associated with the territories where it is to be implemented (Hall, 2014). However, all rewilding strategies coincide in restoring biodiverse ecosystems through the role played by keystone species.

Secondly, foodscapes are the building blocks of global food systems. According to recent studies, a foodscape is defined as a distinct food production geography with specific combinations of biophysical qualities and management patterns (Bossio *et al.*, 2021). The concept of foodscapes helps address the

conundrum of making food systems work both for people and the planet by embracing the complexities and interdependencies existing in a particular geographical area. Despite the very diverse array of foodscapes, it is possible to classify and map them considering some basic attributes. With at least 80 foodscapes already recognized (Bossio *et al.*, 2021), here I focus on discussing the tensions that rewilding may generate in relation to only two broad types: industrialized and semi-wild foodscapes.

The next key term is identity. Here, I assume that concern for feeding a specific population is conditioned by the cultural and historical traditions of the territory in question. This identity conditionality of food often affects preservation of the local fauna. Political philosophers have discussed the concept of identity at length since the end of the 20th century (Tudor, 2014). Some of the most recognized, such as Charles Taylor, have argued that personal identity is the realization of a meaningful way of life within a cultural framework, meaning that moral identity is shaped by cultural identity (1989). Drawing on Heidegger's notion of the historicity of the being, Taylor claimed that the historical narrative itself was the locus of meaning. Here, I embrace this idea and understand identity foodscapes as dynamic environments where changes take place that respond to the historical cultural meanings maintained by their closest inhabitants. In turn, becoming part of the community living in or next to a foodscape sometimes entails absorbing its tradition and recognizing it as a valuable state. The two-way relationship between community identity and foodscapes may cause tensions in relation to rewilding practices.

Fourthly, I will attempt to examine these tensions by adopting a multispecies justice approach. Multispecies justice is an emerging approach committed to including the more-than-human world within the scope of justice. As some scholars have pointed out, multispecies justice rejects the idea that humans are physically separable from nonhuman nature, and even that humans are more important than other species (Celermajer *et al.*, 2021). A multispecies lens focuses on misrecognition as a harmful state that occurs through domination, nonrecognition, and disrespect (Schlosberg, 2007). This also implies being aware of the limits of human capacities to understand nonhuman nature and attending to communication across species. While only humans have obligations to justice, including the more-than-human realm within the sphere of justice entails moral conflicts regarding interventions in relationships among other beings.

These moral conflicts can become more complex if such interventions, including the practice of rewilding, take place within a foodscape with a particular identity. Multispecies justice aims to critically analyse decisions regarding which species, which beings, which relationships and which interconnections are valued and which are not, and who makes such decisions (Celermajer *et al.*, 2021). Framed within this perspective, below I explore two main scenarios where the relationship between food, wildlife and identity values may lead to moral pitfalls.

Passive rewilding in industrial scenarios

Passive rewilding is an approach to rewilding that is committed to achieving the self-sustaining functionality of ecosystems by means of minimal intervention (Pettorelli *et al.*, 2019). It refers to abandoned post-agricultural landscapes that are no longer actively managed by human beings, and it consists in decolonizing the effects of anthropocentric metabolisms on which industrial societies are based. It requires little human intervention in order to allow ecological succession to reach a sustainable state within a landscape matrix of cities, infrastructure and croplands. Passive rewilding initiatives sometimes consist in freeing domesticated animals and various breeds of livestock and releasing lands to allow them to return to wilderness.

Below is a case study depicting a scenario where industrial stockbreeding may shape a foodscape where it is difficult to successfully implement passive rewilding.

Section 2

Foodscares overcrowded by the pork industry

Since the 1950's, Catalonia, in northeast Spain, has become a core industrial pork-producing area with regard to slaughtering and meat processing (Clar, 2010). A total of 43% of all Spanish pork meat is produced in the region (Blanc *et al.*, 2019), which has a total of over 7.7 million pigs (piglets, pigs for fattening and for breeding), a figure that has almost tripled in the last 35 years (Peñuelas *et al.*, 2021). The pork industry in Catalonia can be defined as intensive, with a high concentration of stabled animals in the farms producing nitrate contamination in the freshwater and underground (Food & Water Europe, 2017). These, among other environmental effects (Noya *et al.*, 2021), shape foodscares where achieving wildlife regeneration poses a challenge. In other words, it is difficult for wildlife to flourish in territories close to pig farms due to pollution, fragmentation and colonization of the habitat by only a few species (mainly human beings and pigs). But beyond these biogeographical and chemical factors, the Catalan identity may also push back against opportunities for rewilding.

Communities are largely imagined through food. Some researchers have found that pork meat consumption is closely related to the Catalan identity (Argemí-Armengol *et al.*, 2019; Winders and Ransom, 2019). Sometimes, Catalan neo-peasants have even considered pig slaughter as a survival practice through which their identity is shared and reinforced in the face of globalizing political contexts (Hummel and Escribano, 2022).

But is pork industry support and growth a result of the Catalan identity? Or conversely: does the cultural perception of eating pork meat derive from a pre-existing industry? Studies have shown that the density of pig production may affect how meat is perceived culturally. As has been reported in northern European countries, consumers living in areas with higher levels of pig production consume more fresh pork more than those in areas with less production (Verbeke *et al.* 2010). However, this has not been evidenced in the southern European region, which may be related to meat consumption not being viewed as healthy (Argemí-Armengol *et al.*, 2019). Thus, Catalonia foodscares dominated by pig farming may be a consequence of prior identitary factors of their inhabitants. For Catalonia pork meat is a symbol not only of domestic consumption, but also of food export and economy (Noya *et al.*, 2017). Thus, the identity of the pork industry foodscape is also consolidated through the international marketing.

How does the Catalan identity associated with eating pork come into conflict with passive rewilding initiatives then? In several regions of Catalonia with numerous pig herds (e.g. Osona, Segarra), opportunities for ecosystem regeneration are minimal. The high phreatic and air pollution produced by slurry are abiotic environmental factors constraining wildlife flourishing. This has been noted in the Ter river, for example, where otters find it difficult to return on their own when nitrate pollution increases (Ruíz-Olmo *et al.*, 2011). A further example can be found in Les Oluges area, where Mediterranean agroecosystems have been transformed into industrialized farm systems and these metabolisms reduce biodiversity (Diez *et al.*, 2018). Other impediments to rewilding may also arise when native biodiversity is killed or reduced in large areas to make more space and resources available for pigs (Peñuelas *et al.*, 2021).

If some forms of life are expelled from an area, either directly or indirectly, and natural food chains are broken to the point of deteriorating ecosystems, then the starting point from which to propose rewilding practices where nature can manage itself lacks a good prognosis. The transformation of a living, dynamic and diverse environment into a foodscape inhabited by a single, overcrowded animal species that is fattened for human consumption creates conflict with the more austere objectives of rewilding. Through the lens of multispecies justice, human involvement on pig farms therefore implies a colonization of the territory that must be rethought.

Active and trophic rewilding in semi-domesticated scenarios

Active rewilding advocates seek restoration projects based on species translocations, well-planned eradication programs and a better understanding of the effects of species reintroduction on biodiversity, functions and services of ecosystems in the context of intense land use and ongoing climate change (Nogués-Bravo *et al.*, 2016). This rewilding perspective is based on re-establishing missing large-bodied animals and using them to restore top-down interactions, resulting in trophic cascades beneficial for biodiversity (Svenning *et al.*, 2016).

Below is an example of how trophic rewilding procedures may generate moral challenges in semi-wild scenarios.

Foodscapes restricted to reindeer herding:

The Sápmi region in northern Scandinavia is inhabited by thousands of people but covers millions of hectares. The tundra and Sápmi forests are home to some of Europe's most iconic wildlife. But there is no great variety of species or many wild individuals compared to the semi-domesticated reindeer populations used by the Sámi as livestock (more than a half million).

Finland has four large carnivores: the bear, lynx, wolf and wolverine. All are potential threats to reindeer herding in Sápmi. Every year many Sápmi reindeer fall victim to these carnivores (Pohja-Mykrä and Kurki, 2008). However, wolverines themselves have been an endangered species in Finland for the last 40 years, and although their populations have recently increased, they remain a protected species (Lansink *et al.*, 2020). Therefore, while some reintroduction plans have been proposed, the wolverine population is growing outside of the reindeer herding area due to the predatory conflict with reindeer husbandry (Pohja-Mykrä and Kurki, 2008).

The local community has traditionally comprised an indigenous population of semi-nomadic pastoralists who have a particular relationship with both the landscape and the wildlife living in it. Sápmi has been populated by the Sámi for several thousand years, and reindeer herding is an essential component of their culture. For centuries, Sámi pastoralism has contributed to shaping the local territory. The Sámi's right to land is reserved for the reindeer herding community, but non-reindeer herding Sámi are currently in the majority, meaning they do not have any specific land rights (Reimerson, 2016). This poses political challenges: since reindeer herding is possible on both privately-owned and state-owned land, the right to herd reindeer is independent from any contract with the property owner (Torp, 2013). Stewardship over the territory and decision-making regarding it mainly depend on a minority of the Sámi population, who supposedly represent the most primordial identity of this community (Ingold, 1995).

How ethical is the conflict between the Sámi identity and trophic rewilding, where the value of reindeer could be prioritized over the value of other wild animals such as wolverines? In economic terms, the existence of predators would seem to be an inconvenience for reindeer herders, unless grievances are alleviated with external political subsidies (Green, 2009). But what about ecosystem functionality? Although both reindeer and wolverines are considered keystone species, the habitat of the former is prioritized over that of the latter in Sámi. On the one hand, this can lead to conflict on an ecosystem scale. On the other, it may also cause a conflict at the inter-species level, because some predators are forced to move to territories far from the reindeer. This deserves to be rethought from a multispecies justice perspective.

Section 2

In this context, rewilding with predators (e.g. wolves) or wild herbivores (e.g. European bison) could create large-scale disruption to reindeer herding activities, since predator presence represents a major issue for herders (Sjoegren and Matsuda, 2016; Sandström *et al.*, 2009), and other wild herbivores are likely to compete with the reindeer for limited forage resources.

Tippling points when it comes to tackling moral challenges between foodscapes and rewilding

An area degraded by agro-industrial practices presents greater difficulties for wildlife to come back on its own. As has been seen with the example of pigs in Catalonia, foodscapes managed to produce high quantities of pork meat imply severe ecosystem deterioration. And in cases such as Sámi, where reindeer herding and grazing are prioritized, the reintroduction of predators or other large wild herbivores threatens the Sámi way of life. In both scenarios, these foodscapes maintained by cultural identities may represent challenges for rewilding.

However, how might this identity pressure behind foodscapes be addressed and discussed from the viewpoint of multispecies justice concerned with rewilding? Below I identify four tipping points that can help nuance and tackle the debate between food producers and rewilders:

1. *Historicity creates epistemological biases.* Cultural identity may condition the shifting baseline syndrome (Pauly, 1995). In the case of the Sámi communities, their identity has for centuries been linked to a landscape formed by reindeer herding. However, why should it be traced back to this date and not another? There is no clear line as to exactly how far back the Sámi identity can be traced to a foodscape dominated by reindeer. The same doubt arises regarding the foodscapes of pig farming perceived as a symbol of Catalan identity. How a territory is perceived therefore depends on which historical baseline is embraced. We might ask, then, the baseline for whom? This calls for intergenerational dialogues.
2. *Economics blurs identity.* This point leads us to rethink what identity means in an increasingly globalized world. In contexts of competitive capitalism and the commodification of nature, nonhuman animal management may vary according to the benefit it provides as food. For example, in Catalonia, the economy can modify the pork value chain by industrializing it. Although the Catalan cultural identity implies diverse ways of eating pork, the methods of production can change based on economic efficiency –which favors intensive and industrial methods– rather than on the basis of cultural tradition –which could perhaps opt for more extensive methods. This would condition the foodscape as well as possible rewilding practices. Something similar may happen with the Sámi, since one might question whether maintaining the current large populations of reindeer responds more to a commercial interest so that the Sámi can compete with global industrialization rather than to a condition related to identity. Economics might not entirely cloud identity, but it does affect the way it is expressed.
3. *Decision-making regarding keystone species.* Identity helps define which species may be categorized as ‘keystone’. This is true on an ontological or epistemological level, and from ecological ethics perhaps can even be used to justify moral priority over other species. But how should we prioritize when there are two keystone species? In Sámi, there is a potential conflict between the surface area available for reindeer and for other keystone species like wolves or bison. It is a question of justice to decide which one deserves more territory, when they naturally seek to live in internal or adjacent foodscapes. The multispecies justice approach points out that the other species’ identity should be valued from their own rather than from the human point of view (Celermajer *et al.*, 2021).
4. *Ontological relativity of ecosystems.* There is another tipping point related to understanding ecosystems. One might think that, as has tended to take place in Catalonia in recent decades, food intensification actually helps rewilding by implementing a ‘land sparing’ conservation strategy. Paradoxically, some rewilders consider intensive livestock farming as an opportunity to release more wild space than

with extensive agri-food practices (Jokimäki *et al.*, 2019). But there is a question over just what can be considered an ecosystem. Multispecies justice aims to apply a multilevel approach whereby nonhuman nature is considered interdependent and dynamic. Thus, holistic effects derived from land fragmentation and environmental disturbances permeate the flourishing of an ecosystem and constrain wildlife opportunities.

To conclude, (1) and (2) are both tipping points to be considered for both scenarios when analysing the moral pitfalls framed within multispecies justice. On the one hand, foodscapes in industrial metabolisms may lead to specific challenges for passive rewilding such as (4). On the other, although (4) may not be so relevant when analysing the tension between trophic rewilding and foodscapes in semi-wild scenarios, (3) is a major concern that needs to be addressed.

References

- Argemí-Armengol, I., Villalba, D., Ripoll, G. *et al.* (2019). Credence cues of pork are more important than consumers' culinary skills to boost their purchasing intention. *Meat Science*, 154: 11-21. <https://doi.org/10.1016/j.meatsci.2019.04.001>.
- Blanc, S., Gasol, C.M., Martínez Blanco, J. *et al.* (2019). Economic profitability of agroforestry in nitrate vulnerable zones in Catalonia. *Spanish Journal of Agricultural Research*, 17(1): e0101. <https://doi.org/10.5424/sjar/2019171-12118>.
- Bossio D., Obersteiner M., Wironen M. *et al.* (2021). Foodscapes: Toward Food System Transition. The Nature Conservancy, International Institute for Applied Systems Analysis, and SYTEMIQ.
- Celermajer, D., Schlosberg, D., Rickards, L. *et al.* (2021). Multispecies justice: theories, challenges, and a research agenda for environmental politics. *Environmental Politics*, 30(1-2): 119-140. <https://doi.org/10.1080/09644016.2020.1827608>.
- Clar, E. (2010). A World of Entrepreneurs: The Establishment of International Agribusiness During the Spanish Pork and Poultry Boom, 1950-2000. *Agricultural History*, 84(2): 176-194.
- Díez, L., Cussó, X., Padró, R. *et al.* (2018). More than energy transformations: a historical transition from organic to industrialized farm systems in a Mediterranean village (Les Oluges, Catalonia, 1860-1959-1999). *International Journal of Agricultural Sustainability*, 16(4-5): 399-417. <https://doi.org/10.1080/14735903.2018.1520382>.
- Food & Water Europe (2017). Spain, towards a pig factory farm nation? www.foodandwatereurope.org.
- Green, C. (2009). Managing Laponia: a world heritage site as arena for Sami ethno-politics in Sweden. Uppsala University, Disciplinary Domain of Humanities and Social Sciences, Faculty of Arts, Department of Cultural Anthropology and Ethnology, 221.
- Hubbel, A. and Escribano, P. (2022). The neo-peasant movement in Catalonia: An attempt at defining it in the light of the infrapolitical strategies of resistance. *Sociologia Ruralis*, 62(1): 3-23. <https://doi.org/10.1111/soru.12361>.
- Ingold, T. (1995). Work, Identity and Environment: Finns and Saami in Lapland. in *Arctic Ecology and Identity*. Budapest: International Society for Trans-Oceanic Research.
- Jokimäki, J., Suhonen, J., Benedetti, Y. *et al.* (2019). Land-sharing vs. land-sparing urban development modulate predator-prey interactions in Europe. *Ecological Applications*, 30(3).
- Lansink, G.M.J., Esparza-Salas, R., Joensuu, M. *et al.* (2020). Population genetics of the wolverine in Finland: the road to recovery? *Conservation Genetics*, 21: 481-499. <https://doi.org/10.1007/s10592-020-01264-8>.
- Navarro, L.M. and Pereira, H.M. (2015). Rewilding abandoned landscapes in Europe. *Rewilding European Landscapes*, Nogués-Bravo, D., Simberloff, D., Rahbek, C. *et al.* (2016). Rewilding is the new Pandora's box in conservation. *Current Biology*, 26(3): 87-91. <https://doi.org/10.1016/j.cub.2015.12.044>.
- Noya, I., Aldea, X., González-García, S. *et al.* (2017). Environmental assessment of the entire pork value chain in Catalonia – a strategy to work towards circular economy. *Science of the Total Environment*, 589: 122-129. <https://doi.org/10.1016/j.scitotenv.2017.02.186>.
- Pauly, D. (1995). Anecdotes and the Shifting Baseline Syndrome of Fisheries. *Trends in Ecology and Evolution*, 10: 430. [https://doi.org/10.1016/s0169-5347\(00\)89171-5](https://doi.org/10.1016/s0169-5347(00)89171-5).
- Peñuelas, J., Germain, J., Álvarez, E. *et al.* (2020). *Land*, 10(2): 144.

Section 2

- Pettorelli, N., Durant, S.M. and Du Troit, J.T. (2019). *Rewilding*. Cambridge: Cambridge University Press.
- Pohja-Mykrä, M., Kurki, S. (2008). *Asialistalla ahma* (Wolverine Management and Public Attitudes in Finland). Seinäjoki: Ruralia-Institute.
- Reimerson, E. (2016). Sami space for agency in the management of the Lapponia World Heritage site. *Local Environment*, 21(7): 808-826. <https://doi.org/10.1080/13549839.2015.1032230>.
- Ruiz-Olmo, J., Batet, A., Mañas, F. *et al.* (2011). Factors affecting otter (*Lutra lutra*) abundance and breeding success in freshwater habitats of the northeastern Iberian Peninsula. *European Journal of Wildlife Research*, 57(4): 827-842. <https://doi.org/10.1007/s10344-011-0495-0>.
- Sandström, C., Pellikka, J., Ratamäki, O. *et al.* (2009). Management of Large Carnivores in Fennoscandia: New Patterns of Regional Participation. *Human Dimensions of Wildlife*, 14(1): 37-50. <https://doi.org/10.1080/10871200802304726>.
- Schlosberg, D. (2007). *Defining environmental justice: theories, movements, and nature*. Oxford: Oxford University Press.
- Sjoegren, A. and Matsuda, H. (2016). Seeing the Wolf through Sami Eyes – Understanding Human Dimensions of Wildlife Conflict in Northern Sweden. *Sustainable Future for Human Security*, 4(1): 35-49. <https://doi.org/10.24910/jsustain/4.1/3549>.
- Taylor, C. (1989). *Sources of the Self: The Making of the Modern Identity*. Cambridge: Harvard University Press.
- Torp, E. (2013). The legal basis of Sami reindeer herding rights in Sweden. *Arctic Review on Law and Politics*, 4(1): 43-61.
- Tudor, L. (2014). The Philosophy of Identity: Ethnicity, Culture, and Race in Identitarian Thought. *The Occidental Quarterly*, 14(3): 83-112.
- Verbeke, W., Pérez-Cueto, F.J.A., De Barcellos, M.D. *et al.* (2010). European citizen and consumer attitudes and preferences regarding beef and pork. *Meat Science*, 84: 284-292.
- Winders, B. and Ransom, E. (2019). *Global meat: social and environmental consequences of the expanding meat industry*. Cambridge: MIT Press.

23. Will the use of domesticated animals in rewilding projects compromise animal welfare?

P. Sandøe^{1,2*}, C. Gamborg¹ and C. Palmer³

¹University of Copenhagen, Department of Food and Resource Economics, Rolighedsvej 23, 1958 Frederiksberg C, Denmark; ²University of Copenhagen, Department of Veterinary and Animal Sciences, Grønnegårdsvej 8, 1870 Frederiksberg C, Denmark; ³Texas A&M University, Department of Philosophy, College Station, Texas, TX 77843-4237, USA; pes@sund.ku.dk

Abstract

Increasingly, domesticated herbivores, typically horses or cattle, are used in European rewilding projects to help restore missing or dysfunctional ecological processes. Although these animals' movements are constrained by fencing, the goal is, as far as possible, to reduce human intervention and to let the animals fend for themselves. Rewilding projects of this sort have generated significant controversy. Notably, critics of such projects claim that nature conservation comes with (too) high a price in terms of compromised animal welfare, while defenders either claim that benefits to the animals themselves outweigh the costs they also face, or that environmental benefits outweigh the costs to the animals. Based on a survey of public media we identify four different animal welfare issues prominent in the very polarised Danish debate: (1) general conception of animal welfare (absence of suffering vs natural living); (2) welfare assessment level (group vs individual animal welfare); (3) feeding (supplementary feeding vs no feeding regime); (4) death (natural death vs lethal or non-lethal removal). We argue that there is potential for common ground if good welfare is interpreted to include not only absence of suffering and other negative experiences but also animals' autonomy and natural living. However, reactive management interventions should be put in place where severe welfare compromise would otherwise occur.

Keywords: animal ethics, natural living, nature conservation, suffering, naturnationalparker

Introduction

In June 2020, a decision was taken to establish a nationwide, state-driven, rewilding initiative in Denmark comprising up to fifteen National Nature Parks (in Danish: 'Naturnationalparker'; here NNPs) (Naturstyrelsen, 2022). Creation of the first five parks is expected in 2022.

These NNPs are designated for state-owned, mostly forested, land and will range in size from 5 to 30 km². Most are expected to be surrounded by fences up to 2.5 m tall. There will be public access via gates, stiles and across cattle grids, but the NNPs will be kept free of commercial forestry and agricultural production. Animals – mostly large domesticated herbivores such as cattle and horses, although in some cases wild herbivores such as moose and bison – will be released into the NNPs, a type of 'translocation rewilding'. Large predators won't generally be present, but wolves may gain access to the NNPs, as may other wild, non-hoofed animals.

The idea is that the parks will work on a passive, or at least reduced, management principle. The introduced animals will be expected to find their own food all year round. In some parks, male and female animals will be introduced to allow natural reproduction to occur. While the animals will be supervised in accordance with the Danish Animal Welfare Act, these requirements can be relaxed by the Minister for Food, Agriculture and Fisheries. In particular, animal supervision can be 'regular' rather than daily (for horses) and at group rather than individual level (Miljøministeriet, 2021).

Section 2

Unlike most other conservation issues in Denmark, the NNPs have already sparked a fierce debate among experts, stakeholders and, to some extent, members of the public – a debate that began a couple of years before the decision was taken to go ahead with the parks in Denmark. The debates to some extent mirror and are linked to debates concerning other rewilding projects, notably that surrounding the infamous Oostvaardersplassen in the Netherlands (Kopnina *et al.*, 2019). Subjects debated include whether the parks will negatively impact outdoor recreation; whether fenced-in areas belong in ‘nature’; whether the parks will be cost-effective; whether the parks will increase biodiversity; and not least, whether the animals introduced to the parks will suffer.

In this paper, we will focus on the last, and so far, most prominent and polarised of these debates, asking: Is it ethically acceptable, in welfare terms, to manage introduced domestic animals such as horses in the passive, hands-off way usually adopted in wildlife management? First, we will identify four major issues concerning animal welfare in the NNPs, picking out contrasting positions from the existing debate. Second, we will argue that there is potential for common ground if good welfare is interpreted to include animals’ autonomy and natural living, but that interventions should be in place where severe welfare compromise would otherwise result.

Four issues concerning the welfare of horses and cattle in National Nature Parks

We surveyed the Danish debate in public media (newspapers, social media and so on) between 2018 and 2022, identifying four major points of disagreement concerning key aspects of animal management and animal welfare: (1) general conception of animal welfare (absence of suffering vs natural living); (2) welfare assessment level (group vs individual animal welfare); (3) feeding (supplementary feeding vs no feeding regime); (4) death (natural death vs lethal or non-lethal removal). In what follows, we will outline these disagreements, illustrating them with select statements from the debate.

General conception of animal welfare

A central issue here concerns whether good welfare is understood primarily in terms of avoiding suffering, or in terms of being able to express natural behaviour. Many critics worry that when domestic animals are introduced to rewilding projects they risk *suffering* from starvation, diseases, attacks, injuries and so on. There have been previous incidents on existing experimental sites in Denmark (e.g. Molslaboratoriet, a fenced area with horses and cattle owned by a private foundation) where it has been claimed that animals suffered (to the point where it was reported to the police). So far, no charges have been brought against the owners of Molslaboratoriet or other similar projects. But the view that animals had starved and suffered persists, especially on social media.

One vocal critic, Lene Katstrup, a Danish veterinarian, claimed at a rally against the NNPs on the day of the opening of the Danish Parliament (5th October 2021) that:

I am sorry to live in a country where there is a high risk of seeing skinny ... animals in the new fenced animal parks... Animals that [are] desperate or unhappy with hunger or, as they will later become – weak and discouraged. (Katstrup, 2021a, authors’ translation)

Some advocates of the Danish rewilding projects don’t deny that the introduced animals risk suffering, but they claim that the risk will be *outweighed* by benefits from living a more natural life. Bengt Holst, member of the scientific advisory board to the NNPs, stated that:

Animal welfare concerns two things: the absence of negative experiences and the presence of positive experiences ... And there is no doubt that the animals that come out [in the

parks] have a life without limitations. They have behavioural opportunities which none of their stabled conspecifics have. (Prakash, 2021, authors' translation)

Another member of this scientific advisory board, Jens-Christian Svenning, an ecologist, has compared horses' lives at another translocation rewilding project (Oostvaardersplassen in the Netherlands) to the lives of stabled riding horses, claiming that the former have welfare benefits missed by the latter:

There are some who think that horses only have a good life if they are always stout. But, this is not how they live in nature ... The well-fed horses ... probably live an okay life. However, they do not have access to live out very many of their natural behavioural patterns because they are not allowed to form herds and mate as they wish. They are also likely stabled a lot until the girls [sic] have time to ride them. So, I don't think that the wild life can be equated with bad animal welfare. (Winther, 2018, authors' translation)

So, opponents and advocates of NNPs seem to have different conceptions of (good) animal welfare, focusing either on absence of suffering or on natural behaviour. Closely linked to this disagreement is a worry about whether individual animal suffering will be noticed by managers, as we'll now discuss.

Welfare assessment level

Making exemptions to the Danish Welfare Act to allow supervision at herd rather than individual level has proved to be controversial, in particular with some Danish animal welfare NGOs, on the grounds that very poor welfare of particular individuals can be ignored even if overall welfare is seen as satisfactory. For example, Yvonne Johansen, a veterinarian, and Head of Animal Rescue at the NGO Animal Protection Denmark comments:

If we say it is okay to view the herd or flock as a whole, then we are moving away from protecting the individual animal. If it becomes part of the premise that it is okay for the individual animal to suffer a little, as long as the flock thrives, then it is a no-go [for us]. (Prakash, 2021, authors' translation)

Interestingly, the only response we've found to this concern – besides the claim that is not practically feasible to inspect the animals individually – has been discussed above: that this welfare risk to individuals is balanced by welfare benefits from natural living.

Next, we'll consider two controversial specific aspects of animal management in the NNPs: supplementary feeding and managing end of life.

Feeding

The passive (or, at least, reactive) management philosophy of NNPs rejects supplementary feeding of animals in periods with limited natural availability of food, such as in harsh winters or very dry summers. The rationale behind this principle includes: (1) The feed is extra biomass and its nutrients are perceived to have negative impacts on native vegetation; (2) supplementary feeding is believed to affect the behaviour of the animals making them more passive, dependent, tame, and 'lazy', in the words of a Danish biologist, Morten D.D. Hansen (Alvi, 2021), who works on the aforementioned ongoing rewilding experiment in Mols Bjerger. Finally animals that are unused to humans tend to keep a safe distance from them; but those who become acclimatized through feeding may lose their fear of people and so become more dangerous (Alvi, 2021). However, for critics, such as Kattrup, supplementary feeding is a necessity, since if food is limited the welfare of the individual animals may be very poor:

Section 2

If you [those responsible for the parks] insist on having free ranging domestic animals in the parks during winter, make sure that it is stated in a binding guideline or a legal text that the animals must have supplementary feeding in the winter adapted to their needs.
(Kattrup, 2021b, authors' translation)

The question whether to give supplementary feed is closely linked to another management (and welfare) issue: that of having a completely passive management regime, leaving the animals to a potential death of starvation or diseases. In a reactive management approach, lethal or non-lethal removals of e.g. starving or sick animals are permitted.

Death

The Danish Animal Welfare Act states that severely sick or injured animals in human care (which the animals in the parks are) must be euthanized in order to avoid extreme suffering. However, some NNP advocates, like Rasmus Ejrnæs, a biologist, has argued that what the animal welfare legislation prescribes may not be 'optimal' for animal welfare (and/or rights) where welfare is interpreted mainly as about freedom to live and die following a 'natural' path:

... [D]eath is also an expression of life. It is even one of the greatest and most important expressions of life ... The wonderful thing about death is not the resulting carrion. It's not the function it's about, it's the process. In that light, the struggle for life to unfold freely is also a struggle for the animals' right to die without intervention in the death process.
(Ejrnæs, 2018, authors' translation)

Even though Ejrnæs and likeminded defenders of NNPs have not spoken in favour of breaking Danish welfare law, statements like the one above have contributed to generating animosity towards NNPs among those who identify themselves as animal protectionists.

Discussion of the four points of disagreement

Part of the dispute here flows from different ideas of what constitutes good animal welfare: in essence, avoidance of suffering, or animal autonomy. We think that recognizing the value of *both* forms of animal welfare in the professional and public debates could help create more agreement, and potential compromises. As a first step in developing such common ground, we thus emphasize *both* positive welfare gains from animal autonomy *and* the importance of avoiding negative welfare caused by severe suffering in our comments below.

General conception of animal welfare

Over time the notion of animal welfare has developed from a narrow focus on avoiding pain and other forms of suffering towards a broader idea that also includes various forms of positive welfare (Lawrence *et al.*, 2019). Positive welfare may include 'affective engagement' (Mellor, 2015) in species-specific activities, and the exercise of autonomy (Palmer and Sandøe, 2018).

Free living in the wild, then, offers both significant opportunities for positive welfare, and significant challenges in terms of avoiding negative welfare, ones that look rather different from those facing horses and cattle kept under strict human control. Wild-living cattle, for instance, gain positive welfare from a more autonomous, free way of life. But they also face the welfare challenge of finding food in lean times. It may be that the greater autonomy gained from free living helps them to adapt when food is scarce, meaning that the impact is less intense than (for instance) restrictive feeding for confined sows

in an intensive pig production system. Still, there's clearly a trade-off here. Given this, in some instances, we do think that prevention of significant and widespread suffering should trump the promotion of positive welfare.

However, it's also worth noting that well-fed horses and cattle in human care face rather different welfare threats of their own, for instance from confinement, lack of exercise, loss of relationships with conspecifics and inability to perform natural behaviours. So, it's not clearly the case that wild living animals in the NNPs face more welfare challenges than their more domesticated conspecifics.

Welfare assessment level

Welfare, as we see it, is a notion that fundamentally pertains to the individual, not to a flock or other collective entities. Consequently, welfare monitoring and control should focus on individual animals. This individualistic understanding of welfare contrasts, and potentially conflicts, with ecological perspective appraisals that focus at flock or ecosystem level (Swaisgood, 2010). However, it's worth pointing out that several parts of Danish legislation for *farm* animal welfare, for example regarding food pad dermatitis for broilers or shoulder wounds for sows, focus clearly on the group.

Even though, in our view, in principle the focus should be on individual welfare, in practice trade-offs will unavoidably occur. In the case of the NNPs, a requirement for individual supervision may not be practically feasible. Given this, monitoring at group level may constitute a reasonable compromise, since it protects against widespread severe suffering.

Feeding

Avoiding supplementary feeding and thereby ensuring that the introduced animals do not become 'lazy' and passive – if this proved to be the case – especially if this helps to support the trajectory towards re-establishing lost ecosystem functionality, seems like a win/win outcome. Moreover, such management is in line with the vision sketched above of animals as agents in control of their own lives and not as passive recipients of human care.

Also, it is worth underlining that being hungry is not the same as starving. Having access to less food than one is motivated to eat is part of a healthy life for most animals (as well as humans); and having too much food with too high energy density is the cause of major welfare problems for many animals, notably dogs, cats and horses in human care (Sandøe *et al.*, 2014). The experience of hunger and the loss of weight during winter is part of a natural life for both horses and cattle and need not necessarily be seen as a welfare compromise.

However, even though there may be good welfare reasons to avoid supplementary feeding, we think that some adjustment may be required, for example by gradually getting the animals familiar with finding their own food before being released into the parks, comparable to the training given to captive wild animals before being released into the wild in reintroduction projects (Swaisgood, 2010). Also, there may come a point when the welfare value of a natural life is overwhelmed by suffering, as happens at times where mass starvation looms. At this point, intervention may be required; the degree of suffering among fenced horses and cattle, as previously witnessed in the Netherlands, is not in our view ethically acceptable in introduced domestic animals (Kopnina *et al.*, 2019).

Section 2

Death

Relatedly, even though a natural death can be peaceful, in many instances in nature it will be painful. The view expressed by the biologist, Ejrnæs, therefore sounds romanticised and surprisingly distanced from biological reality. Moreover, NNNPs are not comparable with wild nature, and the animals are not wildlife in the true sense, but rather belong to a category between wild and domestic animals; they should be treated as such. Hence, we do not share the view that introduced animals should be left to die in pain, a point at which there are no autonomy gains to them from freedom. Ensuring basic good welfare then implies non-lethal or lethal removal of severely ill or injured animals.

Conclusions

There is potential for common ground between concern for animal welfare and the plans for NNNPs if good welfare is interpreted to include animals' autonomy and natural living. However, reactive management interventions should be put in place where severe welfare compromise would otherwise occur.

References

- Alvi, J.S. (2021). Hestekrigen i Mols Bjerge [WWW Document]. Jyllands-Posten. URL <https://jyllands-posten.dk/kultur/ECE12782029/hestekrigen-i-mols-bjerger/> (accessed 2.26.22).
- Ejrnæs, R. (2018). Ny tråd [WWW Document]. Biodiversitet.dk. URL https://www.facebook.com/groups/biodiversitet/posts/1059968290830424/?comment_id=1059978097496110&reply_comment_id=1059982157495704 (accessed 2.26.22).
- Kattrup, L. (2021a). Om rewilding og sult [WWW Document]. Gylle.dk | landbrug, miljø, natur, biodiversitet. URL <https://gylle.dk/om-rewilding-og-sult/> (accessed 2.26.22).
- Kattrup, L. (2021b). Dyrslæge om rewilding: Politikere har ladet sig besnakke af ideologiske biologer, der ikke ved noget om dyrevelfærd [WWW Document]. Altinget, Miljø. URL <https://www.alinget.dk/miljoe/artikel/dyrslaege-kvaeg-og-hest-i-naturnationalparker-boer-fodres-om-vinteren> (accessed 2.26.22).
- Kopnina, H., Leadbeater, S. and Cryer, P. (2019). Learning to Rewild: Examining the failed case of the Dutch 'New Wilderness' Oostvaardersplassen. *International Journal of Wilderness* 25, 72-89.
- Lawrence, A.B., Vigers, B. and Sandøe, P. (2019). What Is so Positive about Positive Animal Welfare? – A Critical Review of the Literature. *Animals* 9, 783. <https://doi.org/10.3390/ani9100783>
- Mellor, D. (2015). Enhancing animal welfare by creating opportunities for positive affective engagement. *New Zealand Veterinary Journal* 63, 3-8. <https://doi.org/10.1080/00480169.2014.926799>
- Miljøministeriet (2021). Lov om ændring af lov om naturbeskyttelse, lov om skove, dyrevelfærdsloven, lov om mark- og vejfred og færdselsloven (Adgang til at etablere naturnationalparker og obligatorisk digital kommunikation m.v.).
- Naturstyrelsen (2022). Naturnationalparker [WWW Document]. URL <https://naturstyrelsen.dk/naturbeskyttelse/naturprojekter/naturnationalparker/> (accessed 2.26.22).
- Palmer, C. and Sandøe, P. (2018). Welfare, in: Gruen, L. (Ed.), *Critical Terms for Animal Studies*. Univ. of Chicago Pr, pp. 424-438.
- Prakash, T. (2021). Ny lov har skabt stor debat: Minister lover dyrevelfærd for vilde heste [WWW Document]. DR. URL <https://www.dr.dk/nyheder/indland/ny-lov-har-skabt-stor-debat-minister-lover-dyrevelfaerd-vilde-hest> (accessed 2.26.22).
- Sandøe, P., Palmer, C., Corr, S., Astrup, A. and Bjørnvad, C.R. (2014). Canine and feline obesity: a One Health perspective. *Veterinary Record* 175, 610-616. <https://doi.org/10.1136/vr.g7521>
- Swaigood, R. (2010). The conservation-welfare nexus in reintroduction programmes: A role for sensory ecology. *Animal Welfare* 19, 125-137.
- Winther, T.M. (2018). Elge, bison og vildheste: Vil vi se genudsatte dyr lide? [WWW Document]. URL <https://www.kristeligt-dagblad.dk/danmark/er-vi-villige-til-se-genudsatte-dyr-lide> (accessed 2.26.22).

24. Domesticating rewilding: combining rewilding and agriculture offers environmental and human benefits

V. Thomas^{1*}, A. Mondière², M.S. Corson and H.M.G. van der Werf²

¹CRPR, University of Exeter, United Kingdom; ²INRAE, Institut Agro, SAS, Rennes, France; v.thomas4@exeter.ac.uk

Abstract

Despite, or because of, the debates surrounding it, rewilding remains a polarising concept, especially with respect to its (perceived) connotations of removal of human activity, particularly productive agriculture, from land. It is possible to reconcile rewilding and farming, however, thus helping to overcome concerns surrounding rewilding, and to produce win-win outcomes in terms of environmental and human benefits. By ‘domesticating’ rewilding (i.e. adapting it to be more compatible with human needs), ecological restoration can be combined with food production. The most straightforward way of achieving this is ‘agricultural rewilding’, a form of rewilding which aims to restore ecosystem functions using low-intensity human interventions involving the introduction, management, and harvest of livestock. For example, rewilding advocates the introduction of large herbivores for the ecological benefits they deliver within ecosystems. A purist view of rewilding would require that these herbivores be wild, or at least surrogates for wild species: they would provide ecological benefits but play no role in productive agriculture. In agricultural rewilding, however, these herbivores could be domestic species (typically hardy, native breeds), which would act as analogues for their wild counterparts: they would have the same ecological benefits *and* could contribute to food production. Combining rewilding and agriculture in this way helps to address some of the key concerns related to rewilding, such as that it excludes people and their livelihoods from the land, or that it can reduce food self-sufficiency, therefore outsourcing food production (and its related environmental impacts) to other areas. In addition, agricultural rewilding delivers environmental benefits associated with rewilding while also producing high-quality, high-welfare, high-value food in the form of meat that is environmentally, ethically, and financially sustainable.

Keywords: agroecology, conservation, livestock farming, regenerative agriculture

Rewilding as a conservation method and relationship with agriculture

Conservation (i.e. land use which *avoids* resource use by humans) and farming (i.e. land use which *involves* resource use by humans) are often considered diametrically opposed, resulting in the ‘land sparing’ model in which agriculture is intensified in one area to spare land for conservation in another. This land sparing approach is particularly evident in relation to the original concept of rewilding, which advocates sparing large cores of wild land for species whose conservation requires significant amounts of space to insulate them from the risk of extinction (Soulé and Noss, 1998). Many proponents, and indeed opponents, of rewilding still adhere to this view, with proponents claiming that rewilding must be ‘landscape scale’ and opponents fearing that rewilding entails the removal of active human engagement from large areas of countryside. These views are not unfounded since the factors they identify are among the key principles of rewilding, an ecological restoration approach which emphasises decreasing human intervention and increasing other-than-human autonomy. Thomas (2021) lists six factors which can be considered key tenets of rewilding: (1) operating at large scale; (2) increasing biodiversity; (3) restoring ecosystem functioning; (4) decreasing human intervention; (5) increasing other-than-human autonomy; and (6) self-identifying as rewilding. It should be noted, however, that a conservation project

Section 2

need not demonstrate all these factors to be considered rewilding; it need possess only two or more to exhibit ‘family resemblance’ (Wittgenstein, 1968) to rewilding. Family resemblance refers to the notion that members of a group may share different combinations of a common group of traits: thus, while all members of the group may differ, they are broadly similar by virtue of the way their traits overlap (Wittgenstein, 1968). Family resemblance is therefore a very useful concept with which to approach rewilding since the term has been subject to considerable stretching in its transition from the USA to other parts of the world, largely due to its plasticity (Collier and Mahon, 1993; Jørgensen, 2015). As a result, rewilding can now be considered an umbrella term, referring to a range of activities which exist along a spectrum from ‘rewilding max’ to ‘rewilding lite’ (Carver *et al.*, 2021; Gordon *et al.*, 2021; Martin *et al.*, 2021).

In practice then, rewilding means many different things to different people, often related to its geographical context. In the USA, rewilding tends to adhere to its original sense of ‘cores, corridors and carnivores’ (‘three Cs rewilding’, i.e. large reserves of land (cores) are linked together (corridors) to allow large predators (carnivores) to move freely within the landscape and exert a regulatory role on ecosystems (Soulé and Noss, 1998)). In Europe, by contrast, there is less emphasis on large carnivores and greater emphasis on large herbivores; the role of large herbivores as ‘disturbance factors’ and ‘ecosystem engineers’ within a landscape provides a regulatory function in ecosystems as vital as that of carnivores, albeit via grazing and browsing rather than predation (Hodder *et al.*, 2009; Jones *et al.*, 1994). Thus, the North American and European approaches use different orders of animals to achieve similar effects: (re)introducing large carnivores or herbivores restores trophic interactions to ecosystems. Within these broadly conceptually similar approaches of ‘trophic rewilding’ (Pettorelli *et al.*, 2018) practical differences exist however, particularly in relation to levels of human intervention involved. For example, ‘active rewilding’ often entails quite significant human intervention, which may be used as a catalyst at the start of a rewilding project or may be ongoing (Sandom *et al.*, 2018). On the other hand, ‘passive rewilding’ entails little or no human management of land, allowing natural processes to occur autonomously (Sandom *et al.*, 2018), and can include ‘land abandonment’ in which human influence is withdrawn from land which was previously managed (Navarro and Pereira, 2012). Focussing more closely on approaches to rewilding in Europe, an extremely broad range of projects exist; several initiatives all self-identify as rewilding and yet exhibit very different practices, from species reintroduction (e.g. ‘Hop of Hope’ grasshopper reintroduction in England) to restoration of severely degraded ecosystems (e.g. ‘Rewilding Chernobyl Exclusion Zone’ in Ukraine) to wholesale landscape-creation (e.g. ‘Marker Wadden’ in the Netherlands) (Rewilding Europe, 2022). These projects demonstrate the plasticity of the term ‘rewilding’ and extent to which it has become an umbrella term for a multitude of different activities. While some see this proliferation of projects under the heading of rewilding as a dilution of the term’s radical potential (Carver and Convery, 2021), others see it as harnessing its inspirational properties (Deary and Warren, 2018).

Tailoring rewilding to local contexts becomes important since, while the ‘three Cs’ approach may be feasible in the USA, where large areas of (relative) wilderness which are (relatively) free from human influence or artefacts remain, it is less practical in Europe, where there is a long history of dense human habitation and extensive modification of landscape (Linnell *et al.*, 2015). Indeed, rewilding in Europe has experienced considerable controversy due to concerns over human exclusion from landscapes (Brown *et al.*, 2011; Wynne-Jones *et al.*, 2018) and lack of human intervention, which publics have sometimes interpreted as an abnegation of responsibility (e.g. Lorimer and Driessen, 2014). Because of such controversy, and other constraining factors, rewilding in Europe is being considerably adapted, leading to it being described as ‘tamed’ (Martin *et al.*, 2021) or ‘domesticated’ (Thomas, 2021). The forms of rewilding which are emerging are more compatible with other types of land use and therefore more socially acceptable, leading to co-existence and tolerance rather than generating controversy. Indeed, the compromises made by rewilding allow for ‘land sharing’ with farming (rather than relying on land

sparing for conservation), leading to the identification of 'agricultural rewilding', a form of rewilding which aims to restore ecosystem functions using low-intensity human interventions involving the introduction, management, and harvest of livestock (Mondière *et al.*, 2021). Agricultural rewilding offers the potential for win-win scenarios in which biodiversity is increased and ecosystems are restored along with active human intervention in landscapes and the provision of livelihoods which are financially and environmentally sustainable.

Negotiating rewilding and livestock farming

As agriculture occupies nearly 40% of the world's ice-free land (Foley *et al.*, 2011), the biodiversity status of agricultural land is crucial. While rewilding max generally occurs in landscapes where agriculture is absent, marginal or has been abandoned (Navarro and Pereira, 2012), agricultural rewilding can be found on productive, non-marginal land, on individual farms and/or within wider agricultural landscapes. Agricultural rewilding can enhance biodiversity within these areas to a greater extent than would be possible in conventional agriculture. Nonetheless, in negotiating its position within farming landscapes, agricultural rewilding compromises on some of the key tenets of rewilding. This compromise should not be interpreted as a weakness but rather as a strength in that rewilding can exhibit flexibility, expanding its applicability while still achieving its central purpose. While some advocates of rewilding see it as 'in danger of becoming all things to all people' and seek to 'keep it distinctive and close to its ecological roots' (Carver and Convery, 2021), agricultural rewilding is a pragmatic approach which has the potential to make rewilding compatible with other land use, thus reconciling rewilding and agriculture. Indeed, if agricultural rewilding is perceived as less threatening than rewilding max it has the potential to succeed within productive agricultural landscapes where forms of rewilding further along the spectrum may fail. In such cases agricultural rewilding can proceed and provide ecological benefits in human-dominated landscapes whereas, by rigidly adhering to its key tenets, rewilding max may not be able to proceed at all and would therefore produce no environmental benefits. The ways that agricultural rewilding achieves a compromise between rewilding and agriculture are discussed below.

Negotiating landscape scale and composition

It is argued that rewilding must occur at the landscape scale with large, core areas of land spared for conservation. Where this is unfeasible due to human and/or physical landscapes, rather than abandoning aspirations of rewilding, agricultural rewilding can exist at more human-compatible scales, aligned to farms or other areas of landownership (which has been observed to be socially acceptable based on mutual respect for land-ownership rights (Mikołajczak *et al.*, 2021)). In this way, relatively large-scale rewilding can still occur and provide ecological benefits while remaining compatible with existing land-ownership models. Agricultural rewilding can contribute greatly here since, in addition to the size of the area, land composition and heterogeneity are crucial in ensuring restoration of ecosystem functions, both of which can be achieved through pastoral agriculture (Sabatier *et al.*, 2014). For example, Rewilding Britain (2021) list eleven British rewilding projects with areas of 121–4,402 ha which have an agricultural output (i.e. they can be described as cases of 'agricultural rewilding') and which have been engaged in rewilding for at least five years. In these projects human intervention via agriculture is able to maintain heterogeneity at farm (as opposed to landscape) scale.

Negotiating biodiversity and ecosystem functioning

Rewilding emphasises restoring ecosystem functioning via 'natural processes', ideally using other-than-human agency. While rewilding max would insist that any species involved in an ecosystem be wild, agricultural rewilding permits the inclusion of domestic species. For example, certain agricultural systems (e.g. agroecological livestock systems) depend much more on ecosystem services supplied

Section 2

by biological processes than on human inputs, decreasing human inputs and improving ecological integrity to restore ecosystem functions (Therond *et al.*, 2017). When agricultural rewilding combines these principles of agroecology with rewilding, introducing domestic species to serve as ecosystem engineers and as analogues for their wild counterparts, it can have even greater ecological benefits and convert farmland into a biodiverse ecosystem. To function well within the ecosystem, and to provide biodiversity benefits, such species need to be hardy and/or traditional breeds and be well adapted to local conditions (e.g. English Longhorn cattle in Great Britain or Maraichine cattle in French marshland) and be kept at low stocking rates (Herrero-Jáuregui and Oesterheld, 2018). Appropriate stocking rates have been demonstrated at existing (agricultural) rewilding projects: for example, ecosystem restoration in the south block of the Knepp Wildland is performed using several species with an overall stocking rate of 0.23 livestock units/ha/year (unpublished data). Thus, in addition to their role as ecosystem engineers, the domestic species involved in agricultural rewilding have the added benefit of fulfilling a role in productive agriculture which the wild species in rewilding max do not. Moreover, agricultural rewilding can have biodiversity benefits over those of rewilding max since it can create and maintain habitats which may be lost in rewilding max and whose loss would pose a threat to habitat specialists (Navarro and Pereira, 2012).

Negotiating degree of human intervention and other-than-human autonomy

Unlike rewilding max, which ultimately seeks to remove all human intervention from a landscape, agricultural rewilding retains elements of human intervention both by necessity and design. Such interventions can enhance rewilding via habitat restoration, extensive grazing / grazing control or reduction, tree planting, species reintroduction, deer control, and controlled flooding of land, all of which can be conducted as part of agricultural rewilding (indeed these activities are present in rewilding projects listed by Rewilding Britain (2021) which we class as agricultural rewilding). Perhaps most relevant to the continuation of agriculture is the extensive livestock grazing, although deer control and species reintroduction (depending on the species concerned) can also play a role. In this way, agricultural rewilding allows for meat production at a modest level not least because, in order to maintain stocking rates and therefore the functioning of restored ecosystems, species populations must be regulated, with human harvesting of livestock mimicking predation (Gordon *et al.*, 2021). This management and slaughter of species impinges on their autonomy and killing of animals in either conservation or farming contexts is not without controversy. It is, however, arguably more morally defensible to kill animals for food as part of agricultural rewilding than if animals would otherwise be culled but not enter the human food chain, as may occur in rewilding max. Moreover, while some people oppose killing any animal for human consumption, others are particularly concerned by intensive agriculture and the conditions within which animals live and die. Extensive farming as part of agricultural rewilding therefore offers an advantage in that animals can be kept in naturalistic conditions and according to high welfare standards.

Concluding remarks

Agricultural rewilding, which permits continued human intervention in the landscape, offers a win-win scenario. Domestic livestock can be present in the landscape, restoring biodiversity and regenerating ecosystem function, active human intervention in the landscape can continue in the management of these species and, while the autonomy of other-than-human species is somewhat curtailed by their management and ultimate slaughter, their lives, as part of an extensive farming system, will have been lived to high welfare and environmental standards, and their deaths can provide high-quality meat and contribute to food self-sufficiency, thus to some extent decreasing the outsourcing of food production to areas where environmental standards are lower, and avoiding associated environmental impacts. Thus, agricultural rewilding can address two concerns about current animal production by: (1) reversing its impact on

biodiversity; and (2) offering better animal-welfare conditions. While agricultural rewilding produces meat in an environmentally sensitive and sustainable way its primary aim is ecosystem restoration with livestock production as a secondary goal. As a result, its agricultural output is low and this is an obstacle to its expansion in the current context of the need to feed nine billion people by 2050. Further work regarding meat production from agricultural rewilding would therefore be highly illuminating as would research concerning food production from other means and/or changes to consumption habits, all of which will help to address questions of supply and demand for the global population while remaining within planetary boundaries.

References

- Brown, C., McMorran, R. and Price, M.F. (2011) Rewilding – a new paradigm for future conservation in Scotland?, *Scottish Geographical Journal*, 127(4): 288-314.
- Carver, S., Convery, I., Hawkins, S., Beyers, R., Eagle, A., Kun, Z., van Maanen, E., Cao, Y., Fisher, M., Edwards, S.R., Nelson, C., Gann, G.D., Shurter, S., Aguilar, K., Andrade, A., Ripple, W.J., Davis, J., Sinclair, A., Bekoff, M., Noss, R., Foreman, D., Pettersson, H., Root-Bernstein, M., Svenning, J.-C., Taylor, P., Wynne-Jones, S., Watson Featherstone, A., Flojgaard, C., Stanley-Price, M., Navarro, L.M., Aykroyd, T., Parfitt, A. and Soulé, M. (2021) Guiding principles for rewilding, *Conservation Biology*, <https://doi.org/10.1111/cobi.13730>
- Carver, S. and Convery, I. (2021) Time to put the wild back into rewilding, *Ecos*, 42(3).
- Collier, D. and Mahon, J.E. (1993) Conceptual 'stretching' revisited: Adapting categories in comparative analysis, *The American Political Science Review*, 87(4): 845-855.
- Deary, H. and Warren, C. R. (2018) Trajectories of rewilding: A taxonomy of wildland management, *Journal of Environmental Planning and Management*, 1-26.
- Foley, J.A., Ramankutty, N., Brauman, K.A., Cassidy, E.S., Gerber, J.S., Johnston, M., Mueller, N.D., O'Connell, C., Ray, D.K., West, P.C., Balzer, C., Bennett, E.M., Carpenter, S.R., Hill, J., Monfreda, C., Polasky, S., Rockström, J., Sheehan, J., Siebert, S., Tilman, D. and Zaks, D.P.M. (2011) Solutions for a cultivated planet, *Nature*, 478: 337-342.
- Gordon, I.J., Pérez-Barbería, F.J. and Manning, A.D. (2021) Rewilding lite: Using traditional domestic livestock to achieve rewilding outcomes, *Sustainability*, 13(3347).
- Herrero-Jáuregui, C. and Oesterheld, M. (2018). Effects of grazing intensity on plant richness and diversity: a meta-analysis, *Oikos*, 127: 757-766.
- Hodder, K.H., Buckland, P.C., Kirby, K.J. and Bullock, J.M. (2009) Can the pre-Neolithic provide suitable models for rewilding the landscape in Britain?, *British Wildlife*, 20(5): 4-15.
- Jones, C.G., Lawton G.H. and Shackak, M. (1994) Organisms as ecosystem engineers, *Oikos* 69: 373-386.
- Jørgensen, D. (2015) Rethinking rewilding, *Geoforum*, 65: 482-488.
- Linnell, J.D.C., Kaczensky, P., Wotschikowsky, U., Lescureux, N. and Boitani, L. (2015) Framing the relationship between people and nature in the context of European conservation, *Conservation Biology*, 29(4): 978-985.
- Lorimer, J. and Driessen, C. (2014) Wild experiments at the Oostvaardersplassen: Rethinking environmentalism in the Anthropocene, *Transactions of the Institute of British Geographers*, 39(2): 169-181.
- Martin, A., Fischer, A., McMorran, R. and Smith, M. (2021) Taming rewilding – from the ecological to the social: How rewilding discourse in Scotland has come to include people, *Land Use Policy*, 111.
- Mikołajczak, K., Jones, N., Sandom, C.J., Wynne-Jones, S., Beardsall, A., Burgelman, S., Ellan, L. and Wheeler, H. (2021) Rewilding – the farmers perspective. Perceptions and attitudinal support for rewilding among the English farming community, <https://doi.org/10.31235/osf.io/u3a5e>
- Mondière A., Corson, M.S., Morel, L. and van der Werf, H. M.G. (2021) Agricultural rewilding: a prospect for livestock systems, <https://doi.org/10.32942/osf.io/mv6dn>
- Navarro, L.M. and Pereira, H.M. (2012) Rewilding abandoned landscapes in Europe, *Ecosystems*, 15(6): 900-912.
- Pettorelli, N., Barlow, J., Stephens, P.A., Durant, S.M., Connor, B., Schulte to Bühne, H., Sandom, C.J., Wentworth, J. and du Toit, J.T. (2018) Making rewilding fit for policy, *Journal of Applied Ecology*, 1-12.
- Rewilding Britain (2021) Rewilding projects and local groups. Available at: <https://www.rewildingbritain.org.uk/rewilding-network/projects> Accessed April 2021.

Section 2

- Rewilding Europe (2022) European Rewilding Network. Available at: <https://rewildingeurope.com/european-rewilding-network/> Accessed February 2022.
- Sabatier, R., Doyen, L. and Tichit, M. (2014). Heterogeneity and the trade-off between ecological and productive functions of agro-landscapes: A model of cattle–bird interactions in a grassland agroecosystem, *Agricultural Systems*, 126: 38-49.
- Sandom, C.J., Dempsey, B., Bullock, D., Ely, A., Jepson, P., Jimenez-Wisler, S., Newton, A., Pettorelli, N. and Senior, R.A. (2018) Rewilding in the English uplands: Policy and practice, *Journal of Applied Ecology*, 1-8.
- Soulé, M. and Noss, R. (1998) Rewilding and biodiversity: Complementary goals for continental conservation, *Wild Earth*, 8(3): 18-28.
- Therond, O., Duru, M., Roger-Estrade, J. and Richard, G. (2017). A new analytical framework of farming system and agriculture model diversities. A review, *Agronomy for Sustainable Development*, 37.
- Thomas V. (2021) Domesticating rewilding: interpreting rewilding in England's green and pleasant land, <https://doi.org/10.3197/096327121X16328186623841>
- Wittgenstein, L. (1968) *Philosophical Investigations*. London: Blackwell.
- Wynne-Jones, S., Strouts, G. and Holmes, G. (2018) Abandoning or reimagining a cultural heartland? Understanding and responding to rewilding conflicts in Wales – the case of the Cambrian Wildwood, *Environmental Values*, 27(4).

Section 3.

Grasslands, ruminants and climate change

25. A participatory design approach to promote sustainable cattle breeding products and practices in Western France

E.T. Berthet^{1,2,3*}, A. Farruggia⁴ and B. Roche⁴

¹USC 1339, Centre d'Études Biologiques de Chizé, INRAE, 79360 Villiers-en-Bois, France; ²UMR 7372 Centre d'Études, Biologiques de Chizé, CNRS & Univ. La Rochelle, 79360 Beauvoir-sur-Niort, France;

³Université Paris-Saclay, INRAE, AgroParisTech, UMR SADAPT, 75231 Paris, France; ⁴UE DSLP, INRAE, 17450 Saint-Laurent-de-la-Prée, France; elsa.berthet@inrae.fr

Abstract

The Maraichine is a local cattle breed originating from the Atlantic coastal marshlands. The extensive breeding of these hardy cows respects the ecological and hydrological functioning of wet grasslands. Yet, as these cows are poorly valued by the meat industry, new ways of promoting the breed are to be explored. The research presented here consisted in the implementation of a participatory design approach, using the KCP (Knowledge-Concepts-Proposals) method. This participatory design approach was set up on the basis of a long-standing collaboration between local researchers and farmers, and on a preliminary sociological diagnostic. Four workshops were conducted in 2020-2021, bringing together a total of sixty varied stakeholders: farmers, naturalists, consumers, institutional actors, researchers, meat industry intermediaries, etc. At each stage, the organizers did their best to ensure that the research-intervention approach integrated stakeholders' divergent views, was co-constructed, and accounted for the Maraichine breeding's current trajectory. Nevertheless, it raises ethical questions about the position of researchers as well as the involvement of, and appropriation by, stakeholders. This paper presents a reflexive analysis of this collective experience.

Keywords: intervention-research, collective design process, research stance, extensive farming, local cattle breed

Introduction

Scientists and citizens are increasingly calling for agriculture to guarantee food product quality while preserving biodiversity, natural resources and ecosystems. Extensive breeding of small-scale local breeds is in line with these issues (Audiot, 1995). The 'Association for the promotion of the Maraichine cattle breed and wet grasslands' (MA Association) was created in 1986 in western France to develop a conservation programme of the Maraichine local breed. While in the 80's breeders used to own 1 to 4 cows in order to maintain their wet grasslands and for heritage purposes, today the Maraichine population has reached 1,666 females for 127 breeders. Since the beginning, this programme has linked the breed conservation with the preservation of wet grasslands, which used to be important in this region and which provide a large range of ecosystem services (biodiversity preservation, water regulation, etc.). The MA Association has thus traditionally selected hardy cows, allowing extensive breeding methods that respect the ecological and hydrological functioning of wet grasslands. However, these cows are poorly valued by the meat industry, which essentially remunerates breeders according to the animals' meat yield.

Since the 2000s, farmers have tried to develop direct marketing strategies as an alternative supply chain for Maraichine animals to increase their value-added (Steyaert *et al.*, 2007). So far, marketing in short supply chain remained confined to on-farm direct sales coexisting with long supply chains. Projects of collective marketing indeed came up against technical difficulties such as managing the balance

Section 3

between meat pieces or supplying products all year round. Above all, these projects were confronted to diverging farmer representations with regard to many issues: MA breed (genetic) characteristics, wet grasslands values and best management practices, as well as MA breeding (in particular fattening) practices. In 2005, a project attempting to implement an official quality sign approach failed due to such disagreements (Roche *et al.*, 2006). While many farmers still wish to set up collective approaches for promoting the MA breed, they stump over their contrasted points of view.

On the basis of a 30 year-long collaboration, a research team from INRAE proposed to the MA Association to tackle this issue by setting up a participatory design approach. They applied the KCP (Knowledge-Concepts-Proposals) method (Hatchuel *et al.*, 2009, Hooge *et al.*, 2017), a method developed on the basis of Concept-Knowledge (C-K) design theory (Hatchuel and Weil, 2009). This method aims to make the participants identify knowledge gaps, acquire new knowledge, then reflect on desirable solutions to common problems. Over the past decade, this method, initially developed for industrial contexts, has been applied in diverse agricultural and environmental contexts and for various purposes (Labatut and Hooge, 2016, Pluchinotta *et al.*, 2019, Berthet *et al.*, 2020).

This paper reports on the implementation of the KCP method in the Maraichine breeding case, and points at some reflexivity issues when implementing such intervention-research approaches.

Methodology

KCP is a method elaborated to enable a large collective to conduct innovative design thinking. It helps overcoming two types of obstacles: a cognitive one related to fixation effects hindering creativity, and an organizational one related to the fact that radical changes may threaten the cohesion of a collective. To that end, once a collective problem is framed, the method consists in: (1) identifying stakeholders' fixation effects and needs for collective learning; (2) generating a diversity of alternative solutions to the problem at stake; (3) developing an innovative design strategy that fosters commitment.

The KCP method is based on the organisation of workshops and consists in four phases presented below (Figure 1). In order to adapt to farmers' constraints, four successive half-day workshops were held in a central location for the members of the MA Association. Two workshops were devoted to knowledge sharing; a third workshop consisted in the collective exploration of innovative ideas; a last workshop allowed the participants to co-construct concrete projects. The workshops were held between February 2020 and May 2021; they were supposed to take place every two months, but the covid-19 health crisis caused a delay of several months.

Phase D: diagnosis and framing

To begin with, a team of four researchers and two farmers was formed to lead the KCP process. This team was the operational arm of the project steering committee composed of six researchers, five farmers and one consumer. Phase D starts prior to the series of workshops and is carried out by the KCP organizing team. Its purpose is to identify the objectives, the workshop participants to invite, and the practical organizational details. It also consists in developing a range of tools to facilitate knowledge sharing, creative idea exploration and concrete project elaboration. The question formulated to launch the design process was the following: 'What collective mechanism(s) to communicate about, protect and value a heritage made up of both the Maraichine and the wet grasslands?'








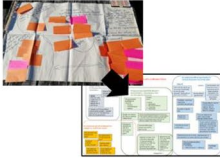

KCP Phases	Phase D: Framing	Phase K: Knowledge Sharing	Phase C: Exploration of ideas	Phase P: Elaboration of projects
Photos of the workshops				
Tools used	Ex-ante and ex-post questionnaires Control exploration map (with CK formalism)	 Expert presentations	 Mood boards	 Project canvasses
Outputs		 Knowledge sheets	 Posters with ideas	 Project description

Figure 1. Photos of the workshops, tools used and outputs related to each KCP phase.

Phase K: knowledge sharing

The objectives of this phase are to identify knowledge gaps and start filling them, and to share individual knowledge and experience among heterogeneous stakeholders. Through presentations and feedback from seven different experts, knowledge on various topics (e.g. short supply chains, consumer expectations, innovative examples of local breed valuation, issues related to wetland ecology and management) was provided and shared. This phase ended with a discussion on the very issue to collectively tackle and the identification of relevant, original and contrasted concepts -or original ideas of interest- to explore in the next phase.

Phase C: exploration of ideas

Phase C consists in a directed creativity approach. The four spotlight concepts defined were the following: ‘The Maraichine, the traditional cow of tomorrow’; ‘The Maraichine at a fair price for all’; ‘The Maraichine, a solar cow’; and ‘A well-valued diversity’. Such concepts needed to be both specific enough and open enough to guide exploration. The participants were split into subgroups of five or six people. The subgroups were composed in such a way as to reflect a mix of backgrounds. Each subgroup explored one spotlight concept and used at its convenience a mood board, a design tool aiming to stimulate creativity elaborated by the KCP organizing team. After a short period of individual reflection, the participants shared their ideas. On paperboards, each subgroup categorized the individual ideas written down on post-its. At the end of this phase, the results consisted of posters compiling the ideas of each subgroup (Figure 1). These posters were collectively shared and discussed.

Phase P: elaboration of projects

The objective of this last phase is to move from exploring a large number of ideas to developing a few concrete projects. Two project canvasses were proposed to the participants, the first one to define the

Section 3

project as such (objective, means, skills and knowledge required, actors involved, etc.), the other one to develop an action plan to implement the project. Again, each subgroup reported its results to all the participants and discussions followed.

All workshops were audio or video recorded and transcribed for data analysis. The KCP organizing team compiled and digitalized all workshop outputs (Figure 1): the knowledge shared during Phase K; the posters elaborated in Phase P containing the participants' ideas; and the project canvasses filled in Phase P. Data compilation relied on both written and audio material. All data were made available to the workshop participants and the MA Association members through a detailed report, a synthetic leaflet and a public restitution. Questionnaires were sent before and after the series of workshops to assess to what extent the participants found the participatory design approach useful and fruitful.

Results

More than a hundred of ideas were proposed by the participants, on various themes, such as ethics in cattle breeding, revisiting traditions, allowing the coexistence of diverse farming systems, improving supply chain governance, allowing a collective definition of prices, or enhancing communication.

Three formalised projects were developed during the last workshop. The motivation for Project 1 was to raise awareness among young people about extensive farming; for Project 2, it was to relocate the production of calves; and for Project 3, the idea was to think about a governance and business model for the marketing of Maraichine meat. While their initial motivations differed, the projects ended up with being quite related. In project 1, public awareness is raised through interventions in schools via courses and/or visits or training courses on farms, while in the project 2 it is done through the consumption of meat in school canteens. Projects 2 and 3 overlap and complement each other on the idea of encouraging the micro-supply chain named 'Biodiversités Maraichines', set up by a local group of farmers in 2020 in parallel to the KCP process, to integrate collective catering (in schools, local communities and companies). Yet, on the one hand, Project 2 focuses on the skills and knowledge farmers should acquire to convince catering establishments to buy local Maraichine veal. It also tackles the collective organization farmers should set up to ensure a regular supply of canteens. On the other hand, Project 3 deals with the functioning of the micro-supply chain as a whole, i.e. it addresses the problem of defining quality criteria specific to the Maraichine, the need for farmers to know more about carcasses in order to be able to work with butchers, and the need to have a person in charge of communicating with the general public about what Maraichine breeding represents.

Our analysis reveals that the overlap between these projects is due to the fact that they are inspired by ideas from all the posters from phase C. Further, the three projects do not reflect the diversity of the ideas raised in Phase C. The outputs of phase C can thus be seen as 'reservoir ideas' and sources of potential other projects that could be initiated later on.

Regarding participation dynamics, the workshops gathered a total of sixty various stakeholders: farmers, naturalists, consumers, institutional actors, researchers, meat industry intermediaries. Yet, this participation lessened in terms of numbers and diversity along the KCP process: whereas the first workshop gathered 33 participants with highly diverse profiles, the fourth one counted 17 participants, only composed of research actors and farmers.

Discussion

Such an exploratory and participatory process appeared as promising to build fruitful interactions not only between farmers, but also between farmers and other actors of the meat supply chain, to maintain

a local breed for biodiversity preservation and local heritage conservation. The objective was to involve a diversity of supply-chain actors to explore both original and feasible solutions. Nevertheless, collectively designing new projects is challenging and conducting such an intervention-research process calls for reflexivity and assessment (Hazard *et al.*, 2020). At the time we are writing this paper, this analysis is ongoing. We present here preliminary insights about exploration and participation dynamics assessment, and about the involved researchers' roles and stances.

Assessing the exploration process

Agroecological innovation depends both on changes in knowledge (e.g. greater integration of knowledge about ecosystem regulations) and on changes in the social interactions inherent in knowledge production. It requires mobilizing a growing range of stakeholders with multiple perspectives as well as hybridizing scientific and stakeholder knowledge. March (1991) distinguishes two types of innovation processes: exploitation and exploration. Exploitation qualifies incremental improvements, which do not require the production of radically new knowledge, in order to achieve clearly defined objectives. Exploration means 'search for new knowledge, use of unfamiliar technologies, and creation of products with unknown demand' (Greve, 2007). They are processes for which objectives, performance criteria and required knowledge are not pre-identified.

Enabling the identification of knowledge gaps and providing tools to foster creativity, KCP is oriented toward innovative design. Our first assessment of the Maraichine KCP design process thus deals with the 'quality' of the exploration process. Regarding knowledge extension, most knowledge shared and discussed was closely related to the field of cattle breeding, yet inspiring examples from other regions as well as innovative tools were introduced to the participants. Furthermore, the number of ideas explored and proposed by the participants was very high (more than a hundred); their originality for the field remains to be assessed. Finally, the projects developed at the end are not radically innovative, and for some of them, have already been initiated by some pioneering members of the MA Association.

Collective design workshops are typically places where farmers exchange, learn and transform themselves (Hazard *et al.*, 2020). We tried to capture these changes through various tools: questionnaires were distributed to the participants before and after the series of workshops; the process was discussed several times with the research project's steering committee; all workshops were recorded and transcribed. Our conclusion to date is that in this particular case, even if the KCP process allowed the accumulation of valuable knowledge and the exploration of many ideas, it was not so much implemented to generate radical innovation as to create a shared project to which most farmers of the Maraichine association could agree with and commit to.

Workshop format and participation dynamics

The format of the KCP process had advantages regarding farmers' constraints and organization, but also limitations. The first limitation is the lack of continuity between the workshops, exacerbated by the COVID-19 crisis: one year passed between the two K-workshops. The transition between the second Workshop K and Workshop C encompassed a fruitful collective discussion (face-to-face then remotely) for the formulation of the spotlight concepts. However, the month separating each phase (K, C and P) impeded fluidity and reuse of content for the following workshop. The second limitation was the difficulty to involve heterogeneous stakeholders who not all had the same degree of involvement and expectations with regard to the approach over the long term. Although a group of motivated and dynamic farmers was present all throughout the process, the erosion of participation (in terms of number and diversity) as the workshops progressed attested to this difficulty. This is a current difficulty in applying the KCP method, initially created for companies in which there are clearly shared objectives

Section 3

and a management authority that can oblige employees to participate in workshops, in contexts where one seeks to bring together diverse territorial actors in a common design process. Comparisons with other KCP formats implemented in the agricultural sector are ongoing.

Researchers' roles and stances

Finally, the role of researchers in such a participatory and exploratory process is a central element in its dynamics (Hazard *et al.*, 2020). Such a role of enabling collective design is not well described in the literature: it is close to the 'honest broker' category proposed by Crouzat *et al.* (2018), who aims at 'expanding the range of proposed policy alternatives'; yet to do so, '[honest brokers] combine diverse sources of knowledge to achieve consensual and innovative outcomes.' They do not drive collective exploration as researchers may contribute while organizing a collective design process.

The researchers carried out several diagnoses prior to the KCP process, analysing social, agronomic and cognitive aspects, then shared and discussed the results with the local stakeholders. At each stage, the KCP organizers did their best to ensure that the intervention-research approach integrated stakeholders' divergent views, was co-constructed, and accounted for the MA Association's current trajectory: they co-designed and co-organised the KCP process; the initial question, the needs for knowledge inputs as well as the spotlight concepts were also collectively defined. Some researchers played the role of workshop facilitators, others contributed to the production of ideas and knowledge in the same way as other participants.

In such a collective design process, power relations can be critical to its success and the adhesion to the process outputs. Yet, dealing with power relations depends not only on facilitators' skills, but also on other factors such as methodological choices, stakeholder scouting or social context understanding (Barnaud and Van Paassen, 2013). When choosing to produce scientific knowledge by interacting with stakeholders, researchers are exposed to their values and interests; this creates a commitment to these stakeholders, and hence a responsibility (Hazard *et al.*, 2020). We consider that this experience is typically what Ansell and Bartenberger (2016) qualify as 'generative experimentalism': conducted on the long term, such an experimental process seeks to generate new, and above all relevant solution concepts, to a specific situation. It requires iteration and dialog, thus necessitates long term collaborations. The KCP collective design process presented here, which lasted about two years, was only a step in the collaboration between INRAE researchers and MA Association, and more generally in the MA cattle breeding and wetland management trajectories.

References

- Ansell, C.K. and M. Bartenberger (2016). 'Varieties of experimentalism.' *Ecological Economics* 130: 64-73.
- Audiot, A. (1995). 'Races d'hier pour l'élevage de demain.' *Races d'hier pour l'élevage de demain*: 1-230.
- Barnaud, C. and A. Van Paassen (2013). 'Equity, power games, and legitimacy: dilemmas of participatory natural resource management.'
- Berthet, E.T., S. Bosshardt, L. Malicet-Chebbah, G. Van Frank, B. Weil, B. Segrestin, P. Rivière, L. Bernard, E. Baritoux and I. Goldringer (2020). 'Designing innovative management for cultivated biodiversity: lessons from a pioneering collaboration between French farmers, facilitators and researchers around participatory bread wheat breeding.' *Sustainability* 12(2): 605.
- Crouzat, E., I. Arpin, L. Brunet, M.J. Colloff, F. Turkelboom and S. Lavorel (2018). 'Researchers must be aware of their roles at the interface of ecosystem services science and policy.' *Ambio* 47(1): 97-105.
- Greve, H. (2007). 'Exploration and Exploitation in Product Innovation.' *Industrial and Corporate Change*: 1-31.
- Hatchuel, A., P. Le Masson and B. Weil (2009). *Design theory and collective creativity: a theoretical framework to evaluate KCP process*. International Conference On Engineering Design. Stanford University, Stanford, CA, USA.

- Hatchuel, A. and B. Weil (2009). 'CK design theory: an advanced formulation.' *Research in engineering design* 19(4): 181.
- Hazard, L., M. Cerf, C. Lamine, D. Magda and P. Steyaert (2020). 'A tool for reflecting on research stances to support sustainability transitions.' *Nature Sustainability* 3(2): 89-95.
- Hooge, S., M. Béjean and F. Arnoux (2017). Organising for radical innovation: The benefits of the interplay between cognitive and organisational processes in KCP workshops. *The Role of Creativity in the Management of Innovation: State of the Art and Future Research Outlook*, World Scientific: 205-237.
- Labatut, J. and S. Hooge (2016). 'Innovative Design, a Tool to Renew the Management of Common Resources. The Case of a Basque Local Sheep Breed.' *Natures Sciences Sociétés* 24(4): 319-330.
- March, J. G. (1991). 'Exploration & exploitation in organizational learning.' *Organization Science* 2(1): 71-88.
- Pluchinotta, I., A.O. Kazakçi, R. Giordano and A. Tsoukiàs (2019). 'Design Theory for Generating Alternatives in Public Decision Making Processes.' *Group Decision and Negotiation* 28(2): 341-375.
- Roche, B., C. Vignard and C. Rossignol (2006). 'L'élevage bovin de race Maraîchine: une démarche de valorisation à l'épreuve de la gestion collective et de référentiels extérieurs.' *Aestuaria* 8: 55-69.
- Steyaert, P., M. Barzman, J.-P. Billaud, H. Brives, B. Hubert, G. Ollivier and B. Roche (2007). 'The role of knowledge and research in facilitating social learning among stakeholders in natural resources management in the French Atlantic coastal wetlands.' *Environmental Science & Policy* 10(6): 537-550.

26. What role for England's grassland farming regions in the transition to a sustainable food system?

C.Y. Broomfield* and A. Maher

Centre for Rural Policy Research, Exeter University, Lazenby, Streatham Campus, Exeter, Devon, EX4 4PJ, United Kingdom; cb978@exeter.ac.uk

Abstract

Cattle and sheep farming is the dominant farming activity of the grassland regions of England, of which the south-west of England (SWE) holds a significant place as the country's biggest regional area of farmed grassland. We posit the prevailing view that cattle and sheep farming is the only place-appropriate food production activity in grassland regions creates a traditionality of grasslands (TOG) narrative that may serve to position these regions at odds with the direction of policy in the UK which seeks to arrest and reverse the triple health, environment and climate crisis. We combine early findings from our PhD research, using mixed methods, to study past and present food production in the SWE. Thematic analysis of research data finds the TOG narrative is composed of multiple elements that intertwine physical limitations of land with human-made limitations of the wider food system. This more nuanced understanding highlights the multiplicity of other stakeholders who have a role and responsibility to facilitate change throughout the whole supply chain, creating space for co-design of a future role for the SWE as an integral part of a sustainable food system in the UK.

Keywords: traditionality narratives, agroecology, mixed farms, land use

Introduction

Globally, modern livestock farming practices are understood to be a major cause of the triple health, environmental and climate crisis (Campbell *et al.*, 2017; Intergovernmental Panel on Climate Change, 2019: 8; Steffan *et al.*, 2015; Willett *et al.*, 2019). In the UK, policy is focused on arresting and reversing the crisis. The UK's Climate Change Committee (CCC), and the government-commissioned National Food Strategy (NFS) review, both prioritise significant reductions in production and consumption of red meat and dairy to improve population health, nature recovery and to meet the government's statutory commitment to achieve 'net zero' by 2050 (Climate Change Committee, 2019 and National Food Strategy, 2021).

The developing direction of policy is reflected in wider society: there has been a significant increase (albeit from a low base) of people adopting plant-only diets which may be indicative of wider societal concerns about meat (Winter, 2018: 49). A growing number of institutions such as universities and local councils are implementing plant-only food policies (Eichler, 2021 and Peat, 2020). The situation presents a particular challenge for England's grassland farming regions, which account for 56% of England's farmed land (DEFRA, 2021a). Cattle and sheep farming is the principal farming activity. Climate, topography and soil types which in some areas can make the growing of other human-edible crops unfeasible, are understood to impose natural limits to the scope of the region's feasible farming activity (Food, Farming and Countryside Commission, 2019).

The assertion that cattle and sheep farming is the only place-appropriate food production activity in grassland regions is a consistent strand of farming's narrative, described by the NFS as a 'common refrain' (NFS, 2021: 96), and which we refer to as the traditionality of grasslands (TOG) narrative. For example,

in its policy position on red meat production, the National Farming Union (NFU) positions ruminant livestock farming as the only viable productive use of England's grasslands (NFU & NFU Cymru, 2020: 3). The gap created by the apparent divergent directions of food-related policy and farming practice raises the question as to what role traditional livestock regions such as the SWE can have in the transition to a more sustainable food system.

Research approach

We follow the approach of Lobley and Winter (2009) and Brassley *et al.* (2021) in prioritizing a deep and nuanced understanding of farming at the local scale in their research design. This paper combines our ongoing PhD research studies looking at the south-west of England (SWE), an important food producing region of England. Data was collected via 1. archival research, 2. Centre for Rural Policy Research's 2020 SWE Farm survey (1,117 responses), and 3. in-depth semi-structured interviews with a total of 51 SWE farmers and/or growers. Interview data was analysed using thematic analysis (Braun and Clarke, 2006) combined with narrative analysis (Reissman, 2008) to identify patterns of emergent themes while paying close attention to extended accounts of richly descriptive narrative to ensure the original intention of individual accounts were understood in their real-world contexts (*ibid.*).

Past and present farming: the ever-changing traditionality of grasslands

Our exploration of the history of food production establishes a counterpoint to the contemporary narrative which tends to suggest that the SWE is only good for growing grass, as illustrated by this interviewee's comments:

...I was at a supper the other day and I had to remind everyone around the table you can't eat grass. You know, physically we can't eat grass and we might not be able to grow much else but grass ... there is only so much we can do with it, yeah, we can plant it all to trees but that's not necessarily going to solve the problem either.

(SWE Farming Representative #1)

Yet, up until the late 19th century, the acreage devoted to arable exceeded that devoted to permanent pasture (Hoskins, 1954: 101). Decades of ensuing agricultural depression and a succession of governments content to increase reliance on food imports drove SWE farmers to concentrate on red meat and dairy farming because it required relatively low capital input and labour to produce perishable products relatively safe from import competition (Brassley *et al.*, 2021: 4). The Second World War (WWII) heralded a significant swing back to arable production in the SWE in common with the rest of the UK (Hoskins, 1954: 103).

Although farming of plants or animals is often framed in contemporary discourse as an either-or option, in practice there is a centuries-long tradition of the two co-existing in a symbiotic relationship. Albeit to varying extents, cattle and sheep have always been an important component of SWE farming, both as a food output and an essential fertility building part of the arable and field crop rotations. However, post-WWII, mixed farming was widely disparaged by agricultural reformers as an inefficient indulgence, practised by farmers who persisted with the 'superstition' that they had a responsibility to do right by the land (Astor and Rowntree, 1946: 113). In their report, *Mixed Farming and Muddled Thinking*, Astor and Rowntree concluded that the farming sector's 'contention that mixed farming is essential if soil fertility is to be maintained is without any real basis' (*ibid.*: 133-134). By the 1960s the UK's productivist agricultural policy and attendant price support mechanisms were widely considered to be sufficient in themselves to safeguard the modern expert farmer from the risks of a downturn in market demand for their particular specialist commodity (Brassley *et al.*, 2021: 205). With experts and

Section 3

government advocating for science-led specialist farming, mixed farming was fast disappearing across the UK, even though many farmers were reluctant to abandon their mixed farming principles. This was particularly the case in the SWE, where mixed farming practices persisted into the late 1960s, viewed by many farmers as both the traditional and ‘*right system*’ (Brassley *et al.*, 2021: 204). The authors found this point frequently expressed by the farmers they interviewed, as illustrated by this Cornish farmer who acknowledges their forebears’ wisdom in practicing mixed farming as:

... just proper traditional Cornish growing... ‘... like a lot of land around here... You know there’s good reason it was only ever mixed farmland.’ (F-G#2, Cornwall)

While pockets of specialised vegetable production remained in SWE, notably swedes in Devon and cauliflowers in Cornwall (MAFF, 1967 and Webber, 1972), the deregulation of markets in the 1980s resulted in a radical shift of power and economic value down UK food supply chains to the fewer, bigger corporate food retailers in a process Dixon and Banwell coined ‘supermarketisation’ (2016). A Devon cattle and swede grower reflected on the effect supermarketisation had on their type of farm enterprise:

There used to be a lot of swede growers around here, a lot of potato growers through the valley... I can think of one around here who still grows potatoes, but nobody else does, it’s the same old story ... you’re not allowed to make money... you’re not allowed to make enough by the supermarkets to see you through the bad times. (F-G#13, Devon)

The combined effects of productivist agricultural policy, together with market liberalization and deregulation also affected other important fruit and vegetable growing sectors in the SWE. In the 1960s government policy incentivized farmers to grub up old orchards, with the consequence that many orchards were converted to pasture for livestock (Leat, 1980). In Devon, the area of land given over to orchard fruit fell by just under 95% between 1955 and 1985 (DEFRA, 2020). Today UK production of apples – one of the country’s main indigenous fruits – accounts for just 40% of domestic consumption (DEFRA, 2021b).

What the traditionality of grasslands narrative really tells us

What becomes apparent from the historical perspective is that farming’s narrative about what land is good for, has been influenced and shaped as much by ‘events’ and the policy responses to them, as by the inherent qualities of land and soil types. The TOG narrative intertwines physical limitations of land with human-made limitations of the social, political and economic dynamics of the wider food system. This complex bundle of factors has become fused into a simplistic narrative that, unintentionally or otherwise, serves to reify grasslands as only fit for grazing livestock. This simplistic TOG narrative risks public perception of farming in grassland regions as being out of step with societal needs and expectations for mixed animal and plant based food production aligned to consumption of a healthier, more diverse and sustainable diet.

The underlying dynamics of the TOG narrative was found in the responses to the 2020 SWE Farm Survey which asked land managers whether they would consider fruit or vegetable production on their holding in future. Of those who provided a free text response ($n=528$), 37% identified the soil, climate or topography of their holding as being unsuitable, despite the survey being broadly representative of a range of holdings and soil types. The next most common reasons were ‘not interested in horticulture / different skill set’ (23%) and ‘profitability concerns / marketing concerns’ (11.5%).

In-depth interviews also reveal some counterpoints to the TOG narrative:

It's just some like weird myth that like there's some magical soil. There are better soils than others, and there are better soils for some things, and the soil around Exeter is excellent, but like you can... veg definitely grows in most soils. (F-G#5, Devon)

And interviews which suggest the current dynamics of a supermarketised supply chain are responsible for creating a self-fulfilling prophecy about the limitations of the soil:

I was talking to a tractor driver up at the winter fair on Saturday that that works for one of the big farms that let a lot of ground to xx [supermarket grower]. He was just shaking his head to me, 'Oh it was just wrecking this ground, just wrecking it' he said ... just pushing the ground as hard as they can to get that crop that they want and then then another grower will come in behind and push it as hard as he can to get his crop ... whereas there's like a lot of land around here... there's good reason it was only ever mixed farmland. (F#2, Devon)

And an interview with a farmer-grower who talked about how the presence of a local fruit and vegetable growing co-operative has stimulated more diverse production:

talking to a neighbour who I've known for years, and I've got a lot of respect for, he said, well, have you considered growing organic crops for local box scheme. He said, 'I'm doing it this year for the first time. They're looking for growers.' (F-G#14, Devon)

Opportunities for the future of farming in the SWE

As previously stated, growing awareness of the triple climate, health and environmental crisis presents a challenge to the SWE and other English grassland regions where the principal farming activity is red meat and dairy production. But the crisis also presents an opportunity. The principles of mixed farming are currently enjoying a rehabilitation, with the diversity of food production emerging as an essential component of a just, sustainable food system (Remans *et al.*, 2014). Advocates of agroecology in the UK emphasize the causal connection between more diverse and balanced food production with more diverse and balanced diets (Campbell, 2022). The UK's main agroecology farming conference has seen numbers increase 10-fold in the past 10 years (Oxford Real Farming Conference, 2022). Interviews were illustrative of this interest:

A lot of our land is quite thin ... so there wasn't a standing case for keeping going on intensive farming ... so in order to have the fertility building phase for the organic arable we've got quite a large area of herbal leys so we can keep those sort of four or five years ... We bought a herd of pedigree Herefords [cattle] to graze them. I mean, it was quite a sea-change. (F#3, Gloucestershire)

So I've had some of the big veg boys ask me about Dexters [cattle]. 'Oh, what animals, what beef animals would follow on a heavy cauliflower field?' or whatever ... so it's interesting how those boys are thinking especially to do with soil structure, getting organic matter back into the soil. (F#18, Cornwall)

Conclusions

Our research approach has facilitated a more nuanced understanding of the TOG narrative in the SWE, leading to several insights. First, farmers and the land that they farm are perhaps the least immutable or obstinate block to achieving a transition to diverse and sustainable food production in the SWE. Indeed, their embedded knowledge, often held across generations of farming families, makes farmers a key asset in delivering the required food system transition. Second, farming's promulgation of the TOG narrative serves to reify grasslands as being suited only for food produced from grazing livestock and risks unintentionally discounting the potential that exists for grasslands, and their farming communities, to align food production with the public's need to transition to more balanced, diverse and sustainable consumption. Third, a more nuanced reading underscores the role of public policy in determining whether the social, political and economic dynamics of the wider food system act as barriers or gateways in enabling farming to transition to sustainable health-orientated food production (Winter, 2018: 58).

Taken together, these insights highlight the multiplicity of other expert and lay stakeholders, in addition to farmers and growers, who have a role and responsibility in facilitating the transition. While complexity arising from a more nuanced understanding can be seen as a challenge, we suggest it also creates opportunities for a wider, more inclusive group of stakeholders to work together to co-design a future role for the SWE as a locus for sustainable, diverse food production better attuned to society's needs and expectations.

References

- Astor, Viscount and Rowntree, B.S. (1946). *Mixed Farming and Muddled Thinking*. MacDonald & Co (Publishers) Ltd., London, 143 pp.
- Brassley, P., Harvey, D., Lobley, M. and Winter, M. (2021). *The Real Agricultural Revolution. The Transformation of English Farming 1939-1985*. Boydell Press, Woodbridge, UK, 288 pp.
- Braun, V. and Clarke, V. (2006) 'Using thematic analysis in psychology', *Qualitative Research in Psychology*, 3(2): 77-101.
- Campbell, B.M., Beare, D.J., Bennett, M., Hall-Spencer, J.M., Ingram J.S.I., Jaramillo, F. Ortiz, R., Ramankutty, N., Sayer, J.A. and Shindell, D. (2017). Agricultural production as a major driver of Earth system exceeding planetary boundaries. *Ecology & Society*, 22(4).
- Campbell, J. (2022) What does food and farming look like after the transition? Available at: <https://fcc.co.uk/library/an-agroecological-uk-2050>. Accessed 18 February 2022.
- Climate Change Committee (2019). *Net Zero. The UK's contribution to stopping global warming* London, Committee on Climate Change. Available at: <https://www.theccc.org.uk/publication/net-zero-the-uks-contribution-to-stopping-global-warming/>. Accessed: 25 February 2022.
- DEFRA (2020). Department for Environment Food and Rural Affairs, June Survey – Structure of Agriculture England – County level up to June 2017. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/927040/structure-june-eng-county-up-to-2017-15oct2020.ods Accessed 26 June 2021
- DEFRA (2021a). Department for Environment, Food and Rural Affairs, Farming Statistics – Land use, livestock populations and agricultural workforce as at 1 June, 2021, England. Published by Department for Environment, Food and Rural Affairs. Available at: <https://www.gov.uk/government/statistics/farming-statistics-land-use-livestock-populations-and-agricultural-workforce-as-at-1-june-2021-england>. Accessed: 18 February 2022.
- DEFRA (2021b). Department for Environment, Food and Rural Affairs, Official Statistics. United Kingdom Food Security Report 2021: Theme 2: UK Food Supply Sources. Available at: <https://www.gov.uk/government/statistics/uk-food-security-report-2021-theme-2-uk-food-supply-sources>#uk-food-security-report-2021-theme2-indicator-2-1-1. Accessed 15 February 2022.
- Dixon, J. and Banwell, C. (2016). Supermarketisation and Rural Society Futures in Shuckman, M. and Brown, D. (eds.) *Routledge international handbook of rural studies*. Abingdon, Routledge, pp. 227-239

- Eichler, W. (2021). County council goes vegan to tackle climate change. 20 December 2021. Available at: <https://www.localgov.co.uk/County-council-goes-vegan-to-tackle-climate-change---/53460>. Accessed 15 February 2022.
- Food Farming and Countryside Commission (2019). Devon Locally Led Inquiry. Grasslands and Livestock Production in Devon. Available at: <https://www.thersa.org/globalassets/projects/psc/ffcc/reports-2/4.-rsa-ffcc-devon---grasslands-and-livestock.pdf>. Accessed 2 February 2022.
- Hoskins, W.G. (2011). Devon (original work published 1954). Collins / Phillimore & Co Ltd. Andover, Hampshire, 598 pp.
- Intergovernmental Panel on Climate Change (2019). Summary for Policymakers, in Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems. Available at: <https://www.ipcc.ch/srccl/>. Accessed 25 February 2022.
- Leat, P.M.K. (1980). Trends in Horticultural Production in South West England. University of Exeter, Agricultural Economics Unit. Report number 210.
- Lobley, M. and Winter, M. (2009). Introduction: Knowing the Land, in Winter, M. and Lobley, M. (eds) What is land for? The food, fuel, climate change debate. Earthscan, London, pp. 1-20.
- MAFF (1967). Ministry of Agriculture Fisheries and Food. Horticulture in Britain: Part 1 – Vegetables. Her Majesty's Stationary Office, London, UK.
- National Food Strategy (2021). Independent Review. The Plan. Available at: https://www.nationalfoodstrategy.org/wp-content/uploads/2021/07/1669_NFS_The_Plan_July21_S11.pdf. Accessed: 5 February 2022.
- Oxford Real Farming Conference (2022) About the Oxford Real Farming Conference. Available at <https://orfc.org.uk/about/>. Accessed 15 February 2022.
- Peat, J. (2020). LSE union votes to ban beef on campus. 24 February 2020. Available at: <https://www.thelondoneconomic.com/news/london-school-of-economics-bans-beef-across-campus-178426/>. Accessed: 15 February 2022.
- Reissman, C.K. (2008) Narrative Methods for the Human Sciences. Sage Publications Inc., Los Angeles, USA, pp. 251.
- Remans, R., Wood, S.A., Saha, N., Anderman, T.L. and DeFries, R.S. (2014). Measuring nutritional diversity of national food supplies. *Global Food Security*, 3(3-4): 174-182.
- Steffen, W., Richardson, K., Rockström, J., Cornell, S.E., Fetzer, I., Bennett, E.M., Biggs, R., Carpenter, S.R., de Vries, W., de Wit, C.A., Folke, C., Gerten, D., Heinen, J., Mace, G.M., Persson, L.M. Ramanathan, V., Reyers, B. and Sörlin, S (2015). Planetary boundaries: Guiding human development on a changing planet. *Science*, 347(6223).
- Webber, R. (1972). *Market Gardening: The History of Commercial Fruit and Vegetable Growing*. David & Charles (Publishers) Ltd, Newton Abbot, Devon, UK, pp. 226.
- Willett, W., Rockström, J., Loken, B., Springmann, M., Lang, T., Vermeulen, S., Garnett, T., Tilman, D., DeClerck, F., Wood, A., Jonell, M., Clark, M., Gordon, L.J., Fanzo, J., Hawkes, C., Zurayk, R., Rivera, J.A., De Vries, W., Majele Sibanda, . . . Murray, C.J.L. (2019). Food in the Anthropocene: the EAT–Lancet Commission on healthy diets from sustainable food systems. *The Lancet*, 393(10170), pp. 447-492.
- Winter, M. (2018). *Changing Food Cultures: Challenges and Opportunities for UK Agriculture*. A Nuffield Farming Lecture Report 2018. University of Exeter, Centre for Rural Policy Research. Exeter, UK, pp. 49-58.

27. Carbon price and be damned

D. Moran* and D. Edgar

University of Edinburgh, Global Academy of Agriculture and Food Security, The Royal (Dick) School of Veterinary Studies and The Roslin Institute, Easter Bush Campus, EH25 9RG, United Kingdom; dominic.moran@ed.ac.uk

Abstract

Global food systems account for an increasingly conspicuous share of global greenhouse gas (GHG) emissions and thus are a cause of climate change. In the face of this existential threat, emissions mitigation arguably represents the single most important system transformation but faces considerable political economy and market barriers that are at odds with the rhetoric of a global climate emergency. Carbon pricing is a theoretically elegant and a superficially fair solution to a problem, and is essentially a version of the polluter pays principle, which in turn routinely and uncontroversially underpins most of our regulation of pollution affecting land, water and air. This paper explores the inevitability and practicality of carbon pricing in the agri food sector, and examines the competing ethical, philosophical and political economy arguments for and against pricing variants both nationally and globally.

Keywords: carbon pricing, ethics, polluter-pays, equity

Introduction

The global food system encompassing production and consumption, is responsible for ~21-37% of annual greenhouse gas emissions (Mbow *et al.*, 2019), a combination of direct and indirect agricultural emissions of methane (CH₄) and nitrous oxide (N₂O) and to a lesser extent carbon dioxide. Agricultural activity generates around half of all anthropogenic CH₄ emissions and around three-quarters of anthropogenic N₂O (Mbow *et al.*, *op cit.*). Emission projections show that in many countries the sector is a growing share of the envelopes that countries need to respect as their international treaty commitments. There is also a trade-off between mitigation in this sector and other sources that need to be accommodated within carbon budgets. Net zero is the most recent interpretation of how the sector is to meet its contribution, limiting emissions from conspicuous sources (e.g. livestock, soils and other supply chain operations), and offsetting the most unavoidable with sequestration in sinks through afforestation and rewetting of peatlands (Beechener *et al.*, 2021). This broad agenda of technical interventions on the production side can be complemented by moderated consumption of meat and dairy products. Indeed, it is unlikely that production interventions alone will be sufficient to reach emissions targets as much of the developing world transitions through more emissions intensive diets.

Both production and consumption interventions raise a variety of ethical challenges for a sector that has largely escaped regulation largely due to the relative biological and behavioural complexity of food systems compared to other sectors – e.g. energy, heavy industry, transport, aviation. This discussion needs to scrutinise implicit claims that the sector is somehow exceptional in the context of mitigation efforts due to its social function in maintaining global food security. This argument often segues to a discussion of the legitimacy and justice of requiring equal mitigation effort in both the global north and south, and the issue of defining historical responsibility for current GHG concentrations.

This abstract unpacks some competing claims around the agri food mitigation agenda focussing particularly on the threats and opportunities implicit in issue of emissions pricing as an ethical response to a clear market failure.

The emissions mitigation challenge

It is biologically impossible to produce food in conventional farming systems without some level of GHG emissions. This being so, there is immediately a decision as to how we fairly allocate allowable emissions across jurisdictions. The agri food GHG burden will necessarily increase as population growth (i.e. demand) and agricultural intensification outstrip current rates of mitigation innovation. As sector emissions have become more conspicuous a variety of technical interventions have been proposed to seek efficient mitigation in modified arable and livestock systems (McDonald *et al.*, 2021). Beyond their technical feasibility, interventions are being scrutinised for their cost-effectiveness, and their behavioural and political feasibility. The latter two considerations addressing whether farmers can and will actually implement the measures voluntarily or pending meaningful stewardship or incentives. This includes explicit policies to mandate, nudge or encourage measure implementation. This can cover ethical dimensions of deregulating new and emerging technologies such as gene drive. Measure cost-effectiveness in a system already draws attention to whether the intervention can reduce a tonne of carbon dioxide equivalent (CO₂e) more cheaply relative to the same unit reduction by measures in another sector, or by purchasing an available carbon credit, representing another's commitment to make a unit reduction. In essence, it makes sense from an efficiency perspective to prioritise the cheapest mitigations first. This in turn implies a cost benchmark or carbon price metric, and thus a utilitarian cost-effectiveness or cost-benefit criterion is already informing mitigation decisions in the sector.

Production pre-supposes demand, and consumers ultimately determine the supply of lower-emissions intensity products. Consumers are implicated in overall agri food emission budgets but carbon content as a food attribute competes for space on already busy product labels. There is thus a challenge to increase transparency and the agency in consumption choices (Webb, 2022). Product price is often the most important product or default attribute in demand. Whether price includes the full or 'true' costs of production is a clear point of ethical debate, turning on how supply chain responsibilities are shared to internalise the additional cost. Both production and consumption decisions need to be scrutinised in any consideration of the equity and fairness of burden sharing. The notional carbon price is the main metric for supply chain transparency.

Carbon pricing and offsetting

The mitigation policy tool box largely comprises voluntary, mandatory or market-based instruments (MBIs), with most countries initially favouring voluntary measures and some governments and private sector bodies experimenting with offsetting through purchase of land for afforestation or using representative credits available in a mostly voluntary credit market (Elliott *et al.*, 2022). There is still much inertia in the levels of agri food mitigation ambition being reached in most countries. This is largely because property right to pollute remain with the land users (i.e. farmers), or else, as with many diffuse pollutants, are ambiguously defined among supply chain actors. Accordingly responsibility for emissions is largely parried and the polluter pays principle (PPP) cannot be equitably implemented between producers and consumers. The latter in particular have no clear line of site for judging their responsibility for food-based emissions, nor a clear market mechanisms for contributing to cover the carbon cost of food.

The emergence of a carbon price renders this situation increasingly anomalous, with a question of the incidence or where to internalise this increasingly conspicuous cost metric. Carbon prices – notionally the marginal damage cost of a tonne of CO₂e – can be identified in existing permit markets, but are more theoretically derived in the calculation of the Social Cost of Carbon (SCC) – the most common policy metric. The SCC is a per-tonne estimate of the long-term social costs caused by carbon emitted

Section 3

in a specific year over time. Assessed as part of so-called integrated assessment models these costs include human health hazards, agricultural disruption, devaluation of investments and infrastructure damages. The SCC can also be used to calculate the benefits of emissions reduction efforts by estimating the economic damage prevented per each tonne of avoided carbon emissions. In capturing the external cost caused by carbon emission, the SCC essentially quantifies what it ought to cost today's emitters to prevent future social and environmental harms. As GHG concentrations in the atmosphere continue to rise, the price of carbon will likely increase to match the worsening projected damages. The information is routinely recalculated as damage cost estimates improve.

There are complex ethical debates around the derivation and use of the SCC. The valuation of damages through time is known to be incomplete due to our inability to quantify some costs – e.g. costs global biodiversity loss or the value of lives lost/saved. Quantifying intergenerational damages to derive a present value price also invokes the use of a discount rate with any positive rate implying an intergenerational value judgement. If we accept the derivation as a best approximation of social costs then carbon prices can be implemented or internalized in several different ways. An externality (or a Pigovian) tax uses SCC information as the basis of a modified marginal tax rate. If applied, the additional external costs theoretically limits production and consumption to a social optimal. How this actually happens in practice is much less certain, and most tax adjustments are an approximation of prevailing SCC estimates.

An alternative to managing emissions through a price is to manage by quantity, or by allocating a pollution quota or a permit to active polluters. Exchange of these permits in limited markets like the EU Emissions Trading System also reveals an alternative carbon price. Academic literature has long discussed the relative merits of managing pollution through prices (i.e. a tax) or quantities (permits). The emergence of emissions trading systems globally has shown both the advantages and disadvantages of allocating tradeable rights to pollute. Both approaches and the more approximate market-based instrument (MBI) of physical offsetting, raise practical and ethical questions that have some significant implications for the ways we produce and consume food.

Ethical challenges

Carbon pricing (as a basis for Pigovian taxes) align with the PPP, which has underpinned environmental policy for decades with modified variants applied in regulations that target the costs of direct (point source) pollution emissions, or on related inputs when the pollution output is diffuse and therefore more complex to identify and attribute. Environmental taxation implements the normative principle of distributive justice that the polluter should pay for damages inflicted on society. If such taxes are revenue positive (as opposed to revenue neutral) they may be designed to address any distributive effects, offsetting the potential regressive effects of the tax, for example where poorer household face a higher burden due to their relatively higher proportion of income expenditure on carbon intensive food products. This corrective element of recycling tax revenues can conceivably extend to the compensation of low income countries thereby implementing an international form of distributive justice, which recognises the historical responsibility for emissions and costs incurred by regulating in countries that did not benefit from carbon intensive development.

In implementing the PPP a fundamental question relates to the identification of the true point of obligation (or polluter). Existing research suggests that the majority of emissions in food production emanate from within the farm gate, and that methods of monitoring, reporting and verification can reliably offer the basis for constructing a workable tax. In increasingly integrated and transnational supply chains the question of burden sharing arises. That is, the liability to pay the external cost may be at the farm gate, but the equitable distribution of the burden could conceivably be shared among supply chain actors in proportion to the revenues extracted from the production, distribution and consumption of

a food product. Ultimately some proportion of this cost will manifest in the price of consumer goods such that we all face the true costs of carbon in food production.

There are broader ethical challenges to the notion of subjecting such an existential threat to the vagaries of utilitarian theory. These arguments turn on whether alternative justice or rights-based approaches can lead humanity to stay within what we now recognise as planetary boundaries. Perhaps a more subtle critique of the neoliberal MBI approach is that it potentially crowds out moral behaviour. In other words, pollution pricing and offsetting may be a modern equivalent of a catholic indulgence. But this turns out to be hard to test since it would be contest specific and as yet there are no practical experiments comparing pre and post pricing behaviours (Ockenfels *et al.*, 2022).

Penetration of carbon pricing and other MBIs

The World Bank's annual 'State and Trends of Carbon Pricing' shows that total of 64 carbon pricing instruments are now in operation around the world, covering over 20% of global greenhouse gas emissions and generating \$53 billion in revenue (World Bank, 2022). The proportion covering agriculture and food is small, with some noteworthy institutional arrangements e.g. in California although the number of formal and informal offsetting arrangements is in voluntary and informal transactions is likely underreported.

Many countries are currently debating the potential implementation of pricing. A new Carbon Pricing for Food Coalition made a specific statement at COP26 in Glasgow seeking to foster greater appreciation of the direct and indirect benefits of MBIs. Attention is increasingly focussing on meat and dairy as the principal sources of both emissions to air and water and the cause of a growing health burden deriving from increased rates of obesity and non-communicable diseases consumption of processed meat products. When these external costs are placed alongside pre-existing animal welfare concerns, the political case for at least exploring direct or indirect sector regulation becomes more palatable. Accordingly, several countries have already decided to introduce or increase taxes on meat (and dairy) or are very close to doing so.

Spain, Germany and New Zealand already decided to introduce or increase taxes on meat and dairy:

- New Zealand will include animal farms into the ETS system for CO₂-emissions by 2025.
- Spain increased VAT tariffs on meat in 2012 to 10%, reduced tariffs on vegetables & fruits to 4%.

Germany will probably tax meat and dairy (VAT tax increase or a consumer tax per kg after 2021; two very large political groups (CDU & Greens) included the Borchert Commission animal welfare tax proposal in their election programs).

The Dutch Government is considering a consumer tax on meat for environmental costs per kg (2-4,7 euro/kg meat).

The EU Commission has proposed to include environmental costs into food prices and taxes as part of its Farm2Fork Strategy; the Commission aims to present a study on implementing the PPP applied agri food GHG-emissions.

Conclusions

The growing external cost of food production is part of the way we are living beyond our environmental means and cheating ourselves and future generations by destroying natural capital (Helm, 2022). Paying the true costs of food and specifically the most conspicuous carbon cost in the form of a tax is one

Section 3

(albeit ethically imperfect) way we can implement PPP, which is largely accepted as a just mechanism for pollution regulation. None of the countervailing ethical challenges to the PPP in the agri food sector is insurmountable given the ways we can address distributive justice using fiscal policy. Nor are any of the objections sufficiently compelling to outweigh the increasingly evident ethical consequences of not pricing carbon. Food sector exceptionalism and food security in the global south is typically evoked as some meta ethical principle that obviates this form of regulation. However, as mentioned the distributional consequences of correcting market failure can be addressed with intra and inter country redistribution.

A number of co benefits bolster the case for carbon pricing. Health care costs are likely to fall as consumers are nudged towards healthier diets containing less meat conforming to the dietary guidelines. In Europe alone, health care budgets are estimated to reduce by 9 billion euro per year if taxes on red and processed meat will be introduced (TAPPC, 2020). (Springmann *et al.*, 2018) set out the extent to which countries can save in health care costs and how many lives and patients can be saved. A significant proportion (55-70%) of West-European citizens support consumer taxes on meat, if in return tax revenues are used to make healthy food cheaper and compensate farmers (TAPPC, 2021).

Acknowledgements

DM acknowledges UKRI support under grant numbers BB/T004436/1, ES/S000186/1 and ES/S000208/1.

References

- Beechener, G., Curtis, T., Fulford, J., MacMillan, T., Mason, R., Massie, A., McCormack, C., Shanks, W., Sheane, R., Smith, L., Warner D. and Vennin, S. (2021). Achieving net zero – a review of the evidence behind carbon offsetting. UK Gov Environment Agency. Available at: <https://www.gov.uk/flood-and-coastal-erosion-risk-management-research-reports/achieving-net-zero-carbon-emissions-a-review-of-the-evidence-behind-carbon-offsetting>.
- Elliott, J., Ritson, J., Reed M. and Kennedy-Blundel, O. (2022). The opportunities of agri-carbon markets: a summary. Green Alliance. Available at: https://green-alliance.org.uk/The_opportunities_of_agri-carbon_markets_policy_and_practice.php.
- Helm, D. (2022). The Financial Times. January 19. Available at: <https://www.ft.com/content/13702f42-a923-4cd8-a6c7-03f775a0742b?shareType=nongift>.
- Mbow, C., Rosenzweig, C., Barioni, L.G., Benton, T.G., Herrero, M. and Krishnapillai, M. (2019). 'Food security' in Climate Change Land: An IPCC Special Report on Climate Change, Desertification, Land Degredation, Sustainable Land Management, Food Security, Greenhouse Gas Fluxes in Terrestrial Ecosystems
- McDonald, H., Frelth-Larsen, A., Lóránt, A., Duin, L., Pyndt Andersen, S., Costa, G. and Bradley, H. (2021). Carbon farming – Making agriculture fit for 2030, Study for the committee on Environment, Public Health and Food Safety (ENVI), Policy Department for Economic, Scientific and Quality of Life Policies, European Parliament, Luxembourg,. Available at: [https://www.europarl.europa.eu/RegData/etudes/STUD/2021/695482/IPOL_STU\(2021\)695482_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2021/695482/IPOL_STU(2021)695482_EN.pdf).
- Ockenfels, A., Werner, P. and Edenhofer, O. (2022). Pricing externalities and moral behaviour. *Nat Sustain* 3, 872-877 (2020). <https://doi.org/10.1038/s41893-020-0554-1>
- Springmann M, Mason-D'Croz D, Robinson S, Wiebe K, Godfray HCJ, Rayner M, Scarborough P, (2018). Health-motivated taxes on red and processed meat: A modelling study on optimal tax levels and associated health impacts. *PLoS ONE* 13(11): e0204139. <https://doi.org/10.1371/journal.pone.0204139>
- True Animal Protein Price Coalition (2020). Aligning food pricing policies with the European Green Deal – True Pricing of meat and dairy in Europe, including CO2 costs. Available at: <https://drive.google.com/file/d/1TuFb2z75vacNpLR97Nx-Gb15PnxEvQKH/view>.

- True Animal Protein Price Coalition (2021). 70% West-Europeans want politicians to change food price VAT. Available at: <https://www.tappcoalition.eu/nieuws/15698/majority-west-european-citizens-have-appetite-for-a-meat-tax--supporting-farmers-and-consumers->.
- Webb, S. (2022). Customers shun red meat after carbon footprint added to weekly shop receipts. Available at: <https://www.independent.co.uk/climate-change/news/oda-red-meat-carbon-footprint-b1995622.html>.
- World Bank (2022). The State and Trends of Carbon Pricing. Available at: <https://carbonpricingdashboard.worldbank.org/>.

https://www.wageningenacademic.com/doi/book/10.3920/978-90-8686-939-8 - Wednesday, December 14, 2022 7:49:12 AM - IP Address: 185.128.124.75

28. Who should get to take credit? Investigating the role of corporations in carbon removal developments

H. Schübel

University of Fribourg Environmental Sciences and Humanities Institute, Ch. du Musée 4, 1700 Fribourg, Switzerland; hanna.schuebel@unifr.ch

Abstract

Planting biomass on agricultural land to feed bioenergy with carbon capture and storage (BECCS) technology is often included in countries and corporations' strategies for reaching their net zero targets. The limited availability of land and the need for food production impose important practical and moral constraints on using agricultural land for growing biomass for BECCS. Corporations are key players in scaling up BECCS technologies, both through funding their development and through developing and providing these services. In light of the constraint of available land, two questions arise: Under which conditions can corporations permissibly offer BECCS and benefit from offering these services? And under which conditions can corporations permissibly use BECCS to offset their emissions? This paper investigates these questions by addressing both the supply and demand side of the newly emerging market in carbon removal, capture, and storage and its link with land. I argue that strong governance is needed for how land is used to supply BECCS, based on justice as well as environmental sustainability criteria. Further, criteria are needed to define which corporations are most or least entitled to use BECCS, given the limited supply of BECCS.

Keywords: land use, bioenergy with carbon capture and storage (BECCS), corporate responsibility, offsetting, sustainability

Introduction

Bioenergy with carbon capture and storage (BECCS) is the technology that the IPCC assumes will be most commonly used in climate stabilization pathways (Fuss *et al.*, 2018). In BECCS, biomass is planted, harvested, and processed in special facilities to create bioenergy. The carbon captured in the biomass is sequestered and stored (CCS), for example in geological reservoirs. As carbon is removed from the atmosphere, employing BECCS at large scales could grant more time for societies, economies, and ecosystems to adapt to changing climatic conditions. The production of bioenergy offers additional mitigation potential and could help economies to decarbonize.

Corporations are key players in scaling up BECCS, both through developing and providing these services and through funding the development by using CDR. BECCS is the carbon dioxide removal (CDR) method most widely adopted in corporations' investment plants on carbon removal, because it allows gains in energy generation and carbon dioxide sequestration (Vivid Economics, 2020). These increasing widespread commitments of corporations to reach net zero targets create high demand for carbon removal services via BECCS to offset their emissions. For example, Microsoft has announced a \$1 billion climate innovation fund to develop CDR and CCS technologies, including BECCS; the company intends to become 'carbon negative' by 2030 and to remove all carbon directly or indirectly emitted since its foundation in 1975 (Smith, 2020).

Most importantly, the supply of BECCS is limited by the availability of land, and especially land where biomass can conveniently be planted and harvested. Producing the large quantities of biomass that are

needed for BECCS 'is likely to push the world to its planetary boundaries in terms of water and land availability' (Vivid Economics, 2020, p. 3) and compete with other land usage. Large-scale BECCS could create problems for sustainable land use, including soil degradation and losses of biodiversity. As a result, the quantity of carbon that can sustainably be removed by BECCS is limited (Fuss *et al.*, 2018).

The extent to which BECCS can be used sustainably is by far exceeded by the commitments of corporations to remove carbon with this method (Reid *et al.*, 2020). This creates a tension between demand and sustainable supply of BECCS raises questions about how such a market should be governed. The revenues to be gained from employing BECCS and buying certificates for BECCS, as well as the major role of corporations on either side of the market, motivate the investigation in this paper of two questions: Under which conditions can corporations permissibly offer BECCS and benefit from offering these services? Under which conditions can corporations permissibly use BECCS to balance out their emissions?

In the following, I present my argument how to answer these questions, drawing attention to the fact that sustainable carbon removal via BECCS is a scarce resource. This restriction needs to be included in the governance of this newly emerging market. I show that inadequate consideration risks not only unsustainable use of land but also increasing injustices on both the demand and supply sides of the market. I first consider the supply side of the carbon market and identify potential injustices that may require the definition of sustainability to be supplemented, as these concerns of justice shape how corporations can permissibly offer BECCS. Second, for the demand side, I present a range of suggestions for criteria that could define which corporations can permissibly use BECCS to offset their emissions.

The challenge of limited sustainable supply

The involvement of the private sector is crucial in upscaling BECCS, and the potential revenues associated with BECCS may be an important driver for its supply. This section investigates the conditions under which corporations can permissibly offer BECCS and benefit from offering these services. I start by outlining the arguments for efficiency and ecological sustainability and argue these, if we accept them, need to be supplemented by justice concerns.

First, efficiency been presented as important criteria for the permissible implementation of BECCS. Because land is scarce and bioenergy can provide an important contribution to reducing emissions, Reid *et al.* claim that we should use land 'as efficiently as possible' (2020, p. 276). The efficient usage of BECCS is limited, among other factors, by the storage capacity of the land in its current state. If ecosystems that store large amounts of carbon are destroyed because the land is converted to plant biomass for BECCS, this creates net positive emissions (Harper *et al.*, 2018) and be inefficient in removing carbon from the atmosphere. Moreover, Megan Blomfield has argued that there are important moral objections against viewing land as a common resource for sequestering emissions that can be distributed efficiently, such as serious implication for land justice like land-grabbing, forced displacement, and unfairness in land-based climate mitigation (2021). These suggest that we need additional justice criteria.

Second, Fuss *et al.* (2018) estimates that the carbon dioxide removal potential of sustainable BECCS could range from 0.5 GtCO₂/year to 5 GtCO₂/year in 2050, depending on the definitions of sustainability used in the model. This is due to the negative impacts of BECCS on biodiversity, soil degradation, and water use. Due to these detrimental effects, it seems plausible that corporations can only permissibly benefit from BECCS if they implement the technology in an environmentally sustainable way – and BECCS is restricted to this estimated amount. But notably, Fuss *et al.* (2018) bases their judgement on a notion of ecological sustainability, primarily based on environmental factors like soil erosion, soil degradation or water availability. It does not directly include social aspects, which are hard to include

Section 3

to the modelling processes their work is based on. But the implementation of BECCS will always have implications for local societies that go beyond securing water and food availability. To decide whether the implementation of BECCS is permissible, both burdens and benefits for the local population and the corporation need to be considered. These are considerations of justice.

Hence, efficiency and ecological sustainability criteria need to be supplemented by justice concerns for determining the permissible use of BECCS by corporations. In the following, I identify three implications of justice that arise when BECCS is implemented.

A first implication of justice is the distribution of burden that arise when BECCS is implemented on an area of land. One burden is to give up the benefits of other alternative uses of the land and water, like agriculture for food and habitation. Most notably, some groups in society are more prone to suffer from food shortages and more likely to have their land grabbed and experience forced displacement (Blomfield, 2021). It poses challenges to food justice if BECCS competes with food production and thereby disadvantage small stakeholders (Kortetmäki and Oksanen, 2016). On a global scale, implementing large-scale BECCS puts the risks of removing carbon on countries of the Global South, disproportionately to their contribution to climate change (Morrow *et al.*, 2020). Hence, like other climate mitigation measures, the burdens of BECCS may be distributed in ways that perpetuate unjust social structures.

A second implication of justice relevant concerns the benefits of employing the technology and how they are distributed. Because BECCS will provide bioenergy and deliver carbon that then can be stored, there are potentially large revenues to be gained (Vivid Economics, 2020) and benefits provided to the sites of implementation. Hence, BECCS can be an important investment in developing countries to support their economies. Unfortunately, investments in the carbon market have been observed to follow the structures of past colonialism (Michaelowa *et al.*, 2019) and mirror the same problematics as other foreign direct investments, such as weak mechanisms for regulating the behaviour of foreign corporations. Forestry projects for carbon credits have already been criticized for a lack of transparency regarding the benefits provided to the local community and stewards of the land (Michaelowa *et al.*, 2019). For BECCS, the situation may be even more difficult: in the case of forestry projects, local communities could make claims to the 'carbon credits' their land was storing, but this claim cannot be made if biomass is planted for BECCS and the carbon is not stored on the land. It may be contested that BECCS would have to provide any benefits to the local communities where the facilities are installed and the biomass planted. However, if the land that BECCS is used on was 'grabbed' and the community displaced, there is no legitimate claim to the land and we can contest that the corporation using BECCS on this land is entitled to these benefits.

A third justice dimension concerns the suitability of corporations to permissibly offer BECCS, and particularly the storage of the carbon that is captured in BECCS. Corporations from the oil and gas industry ('carbon majors') are leading the expansion of carbon sequestration and storage in this emerging market, raising questions of justice (Moss, 2020). The fact that they bear heavy historical responsibilities for their emissions and contribution to climate change makes it morally problematic for them to benefit from carbon removal activities (Lenzi *et al.*, under review).

These considerations of justice as the distribution of burden and benefit need to be considered in addition to the sustainable implementation of BECCS. They limit the permissibility of corporations to implement and benefit from BECCS. For corporations to permissibly offer BECCS and benefit from offering these services, these challenges have to be given adequate consideration, for example, by hindering the access of corporations to regions where food security is already at stake or by reforming land tenures to ensure that local populations are not driven off their land. The case of carbon majors shows that we could

consider excluding some corporations from benefitting from BECCS due to their past actions. These considerations may further restrict the use of BECCS if they are translated into criteria that determine whether corporations can permissibly offer and benefit from BECCS in certain regions.

Is this account too restrictive, and will this disincentivize investments in BECCS? Importantly, current commitments to remove emissions by far exceed the extent to which BECCS can sustainably be provided, even without considering justice as I have done above: The estimate of sustainable usage provided by Fuss *et al.* (2018) is much lower than most models and scenarios predict for the use of BECCS (Reid *et al.*, 2020). This indicates that careful governance is needed when upscaling this technology to avoid major problems of sustainability and justice given the limited supply of land.

The challenge of high demand for BECCS

The transition towards the targets of the Paris Agreement and general climate-stable pathways requires the involvement of global players. Therefore, the multitude of pledges from corporations to be carbon neutral by 2030 (Apple) or 2050 (Volkswagen, Hitachi), or net zero by 2030 (Unilever), 2040 (Walmart, Amazon, Vodafone), and 2050 (Nestle) are a positive development, albeit that varying degrees of integrity have been observed in achieving these targets (Day *et al.*, 2022). While most of these commitments do not include clear strategies of how emissions are offset, BECCS is the CDR method most included in investment plans (Vivid Economics, 2020). BECCS provides benefits in multiple ways for those who fund its use: Corporations that can improve their public image by showing that they fund bioenergy the removal and storage of carbon emissions. But primarily, they can continue to benefit from activities that create emissions, while reducing their net emissions by purchasing certificates.

Given the limited potential of sustainable BECCS, the question is under which conditions can corporations permissibly use BECCS to offset their emissions. Various criteria have been raised in the debate to define whether a corporation permissibly uses BECCS, or more generally offsets, in their climate strategy and I present four central ones below. However, my concern here is that applying these criteria to corporations may not be sufficient, given the limited extent to which BECCS can sustainably be used. Therefore, I then discuss three ways of deciding which corporations are most or least entitled to use BECCS.

Current discussions on net zero targets already indicate that stricter governance is needed to define, assess and overall regulate the extent to which corporations rely on offsetting in their climate strategies (Black *et al.*, 2021). The following four criteria have been suggested to assess the climate strategies of corporations and help to decide whether a corporation can permissibly use BECCS.

- *Fixing concrete steps.* Reports have criticized the lack of concrete steps taken by corporations to meet their climate commitments (Day *et al.*, 2022). One apparent condition to be met would be a transparent communication of the steps the corporation is undertaking, including timelines and intermediate targets of how to reach the target they committed to, and reporting on this progress (Black *et al.*, 2021). Given uncertainties and risks regarding the use and scale-up of BECCS and other CDR, relying on these technologies and forgoing emission efforts has been pointed out to be morally problematic (Lenzi, 2018).
- *Setting separate targets.* The commitments of corporations have to state more precisely the degree of carbon removal they envision. Keeping the pledges of emission reductions and removal distinct from each other instead of summing them up in net zero targets (McLaren *et al.*, 2019) is a vital step in assessing the extent to which a corporation is relying on removal and forgo opportunities to cut their emissions if emission removal is cheaper.
- *Commitment to sustainable BECCS.* The conditions under which BECCS is implemented play a crucial role whether a corporation can permissibly rely on it. When considering the duties of

Section 3

corporations in reducing or removing their emissions, Jeremy Moss argues for applying the ‘principle of unjust restitution.’ This principle states that ‘it is impermissible for an agent to inflict new harms on third parties to rectify past harms.’ (Moss, 2020, p. 51) Hence, it would be impermissible for corporations to use carbon removal credits if these impose harms. This would be a moral argument for corporations using solely ‘sustainable’ BECCS, including justice aspects, as discussed in the previous section.

- *Prioritizing emission reductions.* If the extent to which BECCS can be carried out sustainably is limited, and similar findings limit the use of other CDR methods, corporations must limit it to the extent to which they use these methods. To reach their climate targets, especially commitments to net zero emissions, they need to prioritize reducing their emissions over offsetting them. Not prioritizing emission reductions creates a high risk that the use of CDR technologies and bioenergy will lead to unsustainable lock-in effects instead of a transition to a low-carbon and energy-efficient economy (Reid *et al.*, 2020). Further, the principle of unjust restitution can give corporations a ‘pro tanto’ duty which prioritizes the cessation of emitting activities a stronger over discharging liabilities in many practical instances, such as employing BECCS (Moss, 2020).

Given the large commitments to net zero and hence the high demand for using BECCS, it may be the case that the extent to which corporations fulfil these four criteria would still exceed the extent to which BECCS can sustainably be implemented. Given this imbalance, how should we decide which corporations are most or least entitled to use BECCS?

- *Taking the market prize.* It may be argued that as long as we ensure that the only credits on the market originate from sustainable implementation of BECCS, we could leave the market to determine who purchases removals. Given the needs of corporations to offset their emissions, this would probably lead to raising the prices for BECCS. This would allow corporations with substantial capital to purchase credits and reach their net zero targets. By buying carbon removal certificates, they could reach net zero targets at higher emission levels than corporations that cannot afford buying offsets at high prices. As there is a strong link between the capital held by corporations and their past emissions, it would probably lead to corporations with histories of high emissions to continue to profit from emitting because they could also pay for the removal of these emissions. Hence, this could allow precisely those who have contributed the most to climate change to continue to benefit from creating emissions.
- *Using emissions as indicator.* Another is proposal to take the current level of emissions as an indicator of how many emissions can permissibly be removed by BECCS. Corporations creating high emissions already face high costs in reducing their emissions. Hence, corporations that face strong restraints in reducing their emissions should, it could be argued, be entitled to benefit more from carbon removal. However, it is not clear how to attribute such an entitlement to corporations and may be objected on the same reasons as the market price.
- *Revenues from emissions as indicator.* Instead, we could decide the extent to which a corporation may remove emissions by the profits the corporation makes by emitting. Corporations have been criticized for using net zero pledges to continue benefitting from their emitting activities. Hence, the higher the profits the corporation makes, the higher the price they should have to pay for carbon removals. This could promote stronger efforts to reduce emissions and reduce the incentives to buy carbon credits from BECCS.

Conclusions

Where does this leave us regarding the question of the role of corporations in the market for BECCS? Because corporations have a central role in financing the upscaling of BECCS, the challenge is to keep their commitments to remove emissions via BECCS at the limit of sustainable use without undermining investments in this technology. I have argued that strong guidelines should govern for how land is used by corporations to remove emissions via BECCS, and these should include justice as well as environmental sustainability criteria. As the quantity of BECCS that will be available under these criteria is restricted, strong guidelines should govern how much corporations are allowed to use BECCS to balance out their emissions. The most important guideline is a clear commitment to reducing emissions. If using carbon credits from BECCS is restricted, the criteria proposed to define permissible use of credits should be sensitive to the revenues made from emitting, because profiting from emissions is the main reason for the need for using BECCS.

References

- Black, R.; Cullen, K.; Fay, B.; Hale, T.; Lang, J.; Mahmood, S.; Smith, S. (2021): Taking Stock: A global assessment of net zero targets. Energy & Climate Intelligence Unit; Oxford Net Zero.
- Blomfield, M. (2021): Land as a Global Commons? In *Journal of Applied Philosophy*.
- Day, T.; Mooldijk, S.; Smith, S.; Posada, E.; *et al.* (2022): Corporate Climate Responsibility Monitor 2022. Assessing the transparency and integrity of companies' emission reduction and net-zero targets. New Climate Institute; Carbon Market Watch.
- Fuss, S.; Lamb, W.F.; Callaghan, M.W.; Hilaire, J.; Creutzig, F.; Amann, T. *et al.* (2018): Negative emissions – Part 2: Costs, potentials and side effects. In *Environmental Research Letters* 13 (6), p. 63002.
- Harper, A.B.; Powell, T.; Cox, P.M.; House, J.; Huntingford, C.; Lenton, T.M. *et al.* (2018): Land-use emissions play a critical role in land-based mitigation for Paris climate targets. In *Nature Communications* 9 (1), p. 2938.
- Kortetmäki, T.; Oksanen, M. (2016): Food Systems and Climate Engineering: A Plate Full of Risks or Promises? In Christopher J. Preston (Ed.): *Climate justice and geoengineering. Ethics and policy in the atmospheric Anthropocene*. London: Rowman & Littlefield International Ltd, pp. 121-135.
- Lenzi, Dominic (2018): The ethics of negative emissions. In: *Global Sustainability*. 1, p. 23.
- Lenzi, D.; Schübel, H.; Wallimann-Helmer, I. (under review): Justice in Benefiting from Carbon Removal. Submitted to *Global Sustainability*.
- McLaren, D.P.; Tyfield, D.P.; Willis, R.; Szerszynski, B.; Markusson, N.O. (2019): Beyond 'Net-Zero': A Case for Separate Targets for Emissions Reduction and Negative Emissions. In *Frontiers in Climate* 1.
- Michaelowa, A.; Shishlov, I.; Brescia, D. (2019): Evolution of international carbon markets: lessons for the Paris Agreement. In *Wiley Interdisciplinary Reviews: Climate Change* 10 (6).
- Morrow, D.R., Thompson, M.S., Anderson, A., Batres, M., Buck, H.J., Dooley, K., . . . Wilcox, J. (2020). Principles for Thinking about Carbon Dioxide Removal in Just Climate Policy. *One Earth*, 3(2), 150-153.
- Moss, J. (2020): Carbon majors and corporate responsibility for climate change. In J. Moss, L. Umbers (Eds.): *Climate justice and non-state actors. Corporations regions, cities, and individuals*. Abingdon, Oxon, New York, NY: Routledge (*Routledge environmental ethics*), pp. 45-60.
- Reid, W.V.; Ali, M.K.; Field, C.B. (2020): The future of bioenergy. In *Global change biology* 26 (1), pp. 274-286.
- Smith, B. (2020): Microsoft will be carbon negative by 2030. Official Microsoft Blog. Available online at <https://blogs.microsoft.com/blog/2020/01/16/microsoft-will-be-carbon-negative-by-2030/>, checked on 2/22/2022.
- Vivid Economics (2020): An investor guide to negative emissions technologies and the importance of land use. With assistance of Inevitable Policy Response.

29. Reciprocal climate adaptation responsibilities for agricultural food resilience

I. Wallimann-Helmer

University of Fribourg Environmental Sciences and Humanities Institute, UniFR_ESH Institute, Chemin du Musée 4, 1700 Fribourg, Switzerland; ivo.wallimann-helmer@unifr.ch

Abstract

Ethical research on climate justice most often focusses on how to fairly differentiate responsibilities for climate action based on the various contributions of relevant agents to anthropogenic climate change. This leads to potential blind spots concerning responsibilities for transforming food systems to become more climate resilient. In this paper, I argue that these blind spots can be elucidated by accepting reciprocal climate adaptation responsibilities between industrialized and developing countries in the agricultural food production sector. Industrialized countries share a double responsibility not only to enhance the resilience of their own agricultural food production but also to provide know-how, resources, and technology to foster agricultural adaptation of food systems in need of assistance. In return, developing countries have a reciprocal duty to play their part in reaching climate resilience in their own agricultural food production. Depending on the agents considered, these responsibilities arise at different levels of governance involving various interdependences and power relations.

Keywords: climate justice, food resilience, food justice, climate adaptation, food security

Introduction

In the political public sphere, in international climate politics, and in ethical research on climate justice, independently of climate policy area the focus is most often on how to differentiate the responsibilities for climate action based on the proportional contributions to anthropogenic climate change from past, current, and future emissions (Caney, 2021). In case of climate adaptation, such exclusive reference to emissions neglects crucial considerations and pathways for fairly differentiating climate adaptation responsibilities. This paper uses the example of agricultural food systems to discuss why industrialized and developing countries have reciprocal adaptation responsibilities for making agricultural food systems more climate resilient. Industrialized countries share a double responsibility both to support adaptation action to minimize climate risks in developing countries and to provide assistance, know-how, and technology to enhance the resilience of agricultural food production systems. Developing countries have a reciprocal duty to achieve resilience in their own agricultural food production with the know-how, resources, and technology at hand, and they are entitled to assistance if needed.

The paper proceeds as follows. First, I use a conceptual analysis to show why a unique focus on emissions cannot capture all normative considerations relevant to justifying the differentiation of climate adaptation responsibilities. In climate adaptation, the object of responsibility concerns reducing climate risks and not emissions. Second, I argue that in the agricultural sector climate liability is not of core importance to differentiating climate adaptation responsibilities but effectiveness and sustainability are. These considerations identify local farmers as key agents for fostering climate resilience, be they in industrialized or developing countries. Third, I show why this does not cancel out industrialized countries' larger contributions to anthropogenic climate change. This is why they are responsible for providing assistance, know-how, resources, and technology for effective and sustainable adaptation of agricultural food production where needed. However, this differentiation of responsibilities is qualified

by the fact that different agents at various governance levels depend on other agents that have the power to support or undermine the fulfilment of these responsibilities.

Differentiating climate adaptation responsibilities fairly

Assigning responsibility means defining who is responsible for what (Bayertz, 1995). The 'who' defines the subject of responsibility, the agent that is ascribed responsibility. In our case, these are the agents for climate action. The 'what' defines the object of responsibility. In the area of climate policy, this can concern emissions, payments as compensation for climate harm, action to be taken to adapt, and many more detailed objects of responsibility. Defining who is responsible for what also means determining an institution towards which an agent is responsible. Responsibility means being answerable to the institution that assigns responsibility. In international governance, these are not only institutions at the various levels of climate governance but also, for example, businesses providing technology (Wallimann-Helmer, 2019a). The highest institutions are the bodies of the United Framework Convention on Climate Change (UNFCCC). The subjects answerable to these bodies are usually the parties to the convention. However, this hierarchy can become far more detailed, because further institutions at regional, local and other subnational levels assign responsibilities, and these can also become agents of responsibility answerable to higher level institutions. Considering businesses as responsibility bearers and institutions of answerability makes matters even more complex.

In a communitarian approach, different contexts and goods demand different distributive norms (Walzer, 1983). Distributing responsibilities for reducing emissions demands other norms than distributing responsibilities for adaptation measures. Moreover, the burdens for paying compensation cannot be distributed by following the same norms or specification of norms as for responsibilities for climate mitigation (Wallimann-Helmer, 2019b). Thus, the various areas of climate policy demand various norms for sharing responsibilities. Distributing responsibilities for reducing emissions will most probably rely on norms focusing on emissions. Those who contributed more to climate change have a duty to do more to stabilize the climate. By contrast, the burdens of adaptation measures might be best distributed by relying on competences to most effectively and sustainably provide assistance. And it seems plausible to suggest that the agents who should pay most compensatory payments are those that contributed most to losses and damages due to climate change, but it remains unclear whether payments must be monetary or take some other form.

In international climate politics and climate ethics literature, the object of responsibility is most often restricted to contributions to climate change and its impact, hence the focus on emissions (Gardiner *et al.*, 2010). Emissions are clearly of core relevance for differentiating responsibilities in climate action because anthropogenic emissions are the cause of climate change. However, realizing climate action and sharing its burdens fairly requires more fine-grained differentiations. Otherwise, there is a risk of neglecting important options for optimal solutions and efficient action. This is especially important for climate adaptation because burdens for adaptation do not concern emissions but know-how, resources, and technology for realizing measures (Wallimann-Helmer, 2016). Defining emissions as the sole object of responsibility can only identify industrialized countries as responsibility bearers who should make the greatest contribution to adaptation finance. However, other assignments of adaptation responsibility cannot be captured by relying solely on emissions.

This is so because in climate adaptation the object of responsibility is to reduce the risks of negative climate impacts and not emissions. With emissions, it seems obvious that norms that assign duties proportional to contributions to climate change play a key role. When reducing risks, however, it seems more appropriate to rely on norms that reflect capacities in know-how, resources, and technology to differentiate responsibilities between various agents. Relying on various capacities is relevant to

Section 3

implementing adaptation measures effectively and sustainably. The next section shows why effectiveness and sustainability are of key importance in assigning adaptation responsibilities in the case of agricultural food production systems.

Effectiveness for food resilience

By defining a target of maximum increase of global mean temperature, the parties to the UNFCCC have defined a budget of emissions that can still be produced. This budget not only defines what emission entitlements can be distributed among the parties but also defines how much global emissions must be reduced for the target to be reached. Considering past and current emissions of parties determines who has a duty to reduce their emissions and to what extent. Countries are usually required to reduce their emissions in proportion to their past and present contributions to climate change. Consequently, the object of responsibility with mitigation is clearly emissions and their reduction. This is different for climate adaptation. The goal of adaptation is to minimize the risks of negative climate impacts that have not been or cannot be avoided through emission reductions. They have not been avoided if not enough mitigation action has been taken. They cannot be avoided if emissions are already produced, unavoidably leading to increased climate risks. In this case, what becomes relevant to defining fair distribution of responsibilities for action are these increased risks.

In consequence, the goal of climate adaptation action can be described in two ways (Wallimann-Helmer, 2015). Either it means trying to avoid negative climate impacts altogether or it means lowering the risks of impacts to a tolerable level. For example, a risk of salination of arable land due to sea level rise can be avoided by building sea walls. However, there is always a risk that such adaptation action might not be successful: an extreme weather event may breach the dyke. It therefore seems to make more sense to talk about adaptation as measures that lower climate risks to a level at which they become tolerable. Consequently, the object of responsibility in climate adaptation seems best described as action that makes climate risk tolerable (Dow *et al.*, 2013). From a communitarian perspective, this means that the norms or their specification relevant to fairly distributing adaptation responsibilities will change as well. They will depend on how to implement the object of adaptation responsibility.

In the agricultural food production sector, reducing climate risks means enhancing resilience to minimize food insecurity rather than opting for reduced emissions in production (Kortetmäki, 2022). The goal is not to transform the agricultural system to become less emission intensive but to render it better able to resist climatic shocks and to recover from shocks swiftly. Climate resilience is important because agricultural food systems that are unable to resist climatic shocks or swiftly recover from them increase the risk of food insecurity by undermining the stable supply of food. Hence, it is this object of responsibility that is relevant to distributing responsibilities in transforming the agricultural sector to become more climate resilient.

If enhancing resilience of agricultural food production is the goal, past, current, and future emissions play no crucial role in achieving this objective. What is more important is how to achieve this goal effectively with the most sustainable results. This means changing the perspective of responsibility. What is no longer crucial is distributing responsibilities according to past events but capacities for creating favourable circumstances in the future. Backward-looking responsibility loses importance and forward-looking responsibility gains. Hence, what becomes crucial are the various competences, resources, and technologies of agents for realizing adaptation goals. Because empirical research shows that involving local communities in the planning, implementing, and maintaining of adaptation measures leads to more effective and sustainable results, it is local communities that are most important to realizing the transition of agricultural food systems (Kaswan, 2016). Local people know local conditions best, so they likely also possess the know-how to enhance the climate resilience of their own agricultural systems most

efficiently (Carrillo *et al.*, 2021). In consequence, it seems more plausible to distribute responsibilities for adapting agricultural food systems according to forward-looking efficiency and sustainability criteria rather than by backward-looking considerations about contributions to climate change.

Agricultural duties of the advantaged

The crucial challenge arising from the previous claim that local communities are the ones that should be assigned forward-looking responsibilities to transform their agricultural food systems to become more climate resilient concerns the unequal global distribution of resources and technology. Economic resources and access to biotechnology are not distributed evenly across agricultural communities (Kortetmäki, 2022). Communities in industrialized countries have a particular advantage whilst communities in developing countries are heavily disadvantaged. They do not possess similar financial resources to realize transformation, nor is the technology that helps agricultural systems to become more climate resilient easily available in most developing countries. This situation bears the well-known double inequality that defines the central injustice of climate change (Roser and Seidel, 2017). Those facing the most disadvantages are those that contributed the least to anthropogenic climate change. At the same time, this inequality potentially establishes unequal power relations between those able to provide the necessary resources and biotechnologies and those who need them. A closer look at the conditions necessary for assigning forward-looking responsibilities in climate adaptation helps understand how to overcome these difficulties in the agricultural sector.

Stable production of agricultural food concerns all regions of the world (FAO, 2018). Food security is potentially undermined in every community around the globe because changing climatic conditions alter what and how crops can be grown and also impact livestock breeding. If the argument of the previous section is correct, local farming communities reciprocally share the responsibility to transform their agricultural food systems to become more climate resilient. It is they who have the competence to most efficiently and sustainably implement the measures necessary for their own agricultural systems. Furthermore, in a global economy, food production systems depend closely on each other, and climatic shocks reducing the availability of food in one system can have disastrous consequences for more vulnerable food production systems by changing prices for seeds or staple foods (Chen and Villoria, 2019). If vulnerable systems lack economic resources for seed or food imports, their food security is undermined. In consequence, even though all farming communities share reciprocal climate adaptation responsibilities, these responsibilities must be qualified according to interdependences and unequal access to resources. Those with more resources share more responsibilities to make their own food systems climate resilient.

However, no community can implement their responsibilities if they lack capacities in know-how, resources, or technology. This can either be due to disadvantaged economic or environmental conditions or because communities and agents depend on higher-level institutions or businesses who do not provide the support needed for implementing responsibilities (Juhola, 2019). In both cases, it would be inappropriate to demand the fulfilment of responsibilities without providing the conditions necessary to do so. If agricultural communities face economic or environmental disadvantages, they are entitled to support to better deal with these conditions, such as additional economic and technological support. If know-how is lacking, assistance to acquire it becomes crucial, whether by establishing educational institutions or by providing the knowledge directly (Wallimann-Helmer, 2016). If agents depend on institutions that do not support them appropriately in realizing their responsibilities, then those higher-level institutions need to be reformed or receive the resources and technology needed to support lower-level agents in the correct way (Wallimann-Helmer, 2019a). Similarly, if businesses that have the means to enhance resilience but tend to undermine the realization of adaptation responsibilities, these dependencies also need to be changed as part of adaptation measures.

Section 3

These interdependences, which probably undermine the realization of adaptation responsibilities, express inappropriate power relations between local agricultural communities and other higher-level governance institutions and businesses. Hence, the difficulties of local farming communities in meeting their forward-looking responsibilities for more climate resilience may also indicate inappropriate dependences and power relations. Adaptation assistance to transform agricultural food systems to become more climate resilient should also take proper care of such challenges (Rossi *et al.*, 2019). This is where the responsibilities of the industrialized countries become relevant to have contributed and continue to contribute more to climate change. In many cases, they are the ones with the resources and technology necessary to assist agricultural systems in need of assistance. Often, they also have know-how that could improve the situation of local farming communities and higher-level institutions. To do so means discharging their responsibilities for having contributed and continuing to contribute more to climate change. However, because adaptation action is more efficient and sustainable when local communities are involved, their involvement and if needed some investment in institutional circumstances that allow for their proper involvement is also of very high relevance. It is only by involving local communities that inappropriate interdependences can be overcome and appropriate standards of justice to realize more food resilience all over the world can be defined.

References

- Bayertz, K. (1995). Eine kurze Geschichte der Herkunft der Verantwortung. In: Bayertz, K. (ed.) Verantwortung. Prinzip oder Problem? Wissenschaftliche Buchgesellschaft, Darmstadt, Germany, pp. 3-71.
- Caney, S. (2021). Climate Justice. In: Zalta, E.N. (Ed.) The Stanford Encyclopedia of Philosophy. Stanford University, Stanford, CA, USA.
- Carrillo, T., Wallimann-Helmer, I. (2021). Food security and cultural identity in agricultural adaptation – a trade-off? In: Schübel, H. and Wallimann-Helmer, I. (eds) Justice and food security in a changing climate. Wageningen Academic Publishers, Wageningen, the Netherlands, pp. 91-96.
- Chen, B., Villoria, N.B. (2019). Climate shocks, food price stability and international trade: evidence from 76 maize markets in 27 net-importing countries. *Environ. Res. Lett.* 14: 14007.
- Dow, K., Berkhout, F., Preston, B.L., Klein, R.J. (2013). Limits to adaptation. *Nature Climate Change* 3: 305-307.
- FAO (2018). The state of food security and nutrition in the world: Building climate resilience for food security and nutrition, FAO, Rome, Italy, 181 pp.
- Gardiner, S.M., Caney, S., Jamieson, D., Shue, H. (eds.) (2010). *Climate Ethics: Essential Readings*. Oxford University Press, New York, NY, USA, 351 pp.
- Juhola, S.K. (2019). Responsibility for climate change adaptation. *WIREs Clim Change* 10.
- Kaswan, A. (2016). Climate Change Adaptation and Theories of Justice. *Archiv für Rechts- und Sozialphilosophie Beihefte*: 97-118.
- Kortetmäki, T. (2022). *Agriculture and Climate Change: Ethical Considerations*. Federal Office for Buildings and Logistics FOBL, Bern, Switzerland.
- Roser, D., Seidel, C. (2017). *Climate justice: An introduction*. Routledge Taylor & Francis Group, New York, NY, USA, 229 pp.
- Rossi, A., Bui, S., Marsden, T. (2019). Redefining power relations in agrifood systems. *Journal of Rural Studies* 68: 147-158.
- Wallimann-Helmer, I. (2015). Justice for Climate Loss and Damage. *Climatic Change* 133: 469-480.
- Wallimann-Helmer, I. (2016). Differentiating responsibilities for climate change adaptation. *Archiv für Rechts- und Sozialphilosophie (ARSP)* 149: 119-132.
- Wallimann-Helmer, I. (2019a). Common but differentiated responsibilities: agency in climate justice. In: Harris, P. (Ed.) *A Research Agenda for Climate Justice*. Edward Elgar Publishing, Camberley Surrey, UK, pp. 27-37.
- Wallimann-Helmer, I. (2019b). Justice in Managing Global Climate Change. In: Letcher, T. (ed.) *Managing Global Warming: An Interface of Technology and Human Issues*. Elsevier, Amsterdam, the Netherlands, 751-768.
- Walzer, M. (1983). *Spheres of justice: a defense of pluralism and equality*. Basic Books, New York, NY, USA, 345 pp.

Section 4.

Animal ethics

30. The ethics of remedial animal enhancement: what can we learn from other (dis)enhancement debates?

B. Bovenkerk* and K. Kramer

Wageningen University, Hollandseweg 1, 6706 KN Wageningen, the Netherlands; bernice.bovenkerk@wur.nl

Abstract

In the Anthropocene, many non-human animals face anthropogenic challenges. Farmed animals suffer as a result of (intensive) rearing conditions, while in the wild animals have difficulty adapting to human-induced pressures such as climate change and invasive species. Biotechnologies such as gene editing could be applied to improve or add capacities that would enable animals to cope with such challenges, in the interest of those animals themselves (or their offspring). This paper argues that such ‘remedial animal enhancements’ deserve a special ethical debate, although such a debate can draw some arguments and perspectives from other (dis)enhancement debates.

Keywords: biotechnology, gene editing, transhumanism, ideal and non-ideal ethics

Introduction: remedial enhancement and other types of animal (dis)enhancement

New biotechnologies such as gene editing open up new ways to ‘enhance’ not only humans, but also non-human animals. First, what could be called ‘anthropocentric’ animal enhancements involves biotechnologically adapting animals to meet human purposes or challenges (cf. Hauskeller, 2016). Gene editing could for example be applied to increase farmed animals’ yield or to reduce their environmental impact, thus addressing some of the challenges that population growth and climate change pose to humans in the Anthropocene. Second, transhumanists have argued that we humans have an obligation to biologically ‘uplift’ animals’ cognitive capacities, once we have developed proper means to do this, so that animals can participate in human society more meaningfully and have better lives (Dvorsky, 2008). Third, ethicists have been discussing the desirability of ‘dumbing down’ animals that are destined to live under very unfavourable conditions by diminishing their capacity for suffering (e.g. Thompson, 2008). Although the latter type of intervention has usually been called a *disenhancement* because it involves limiting rather than improving or adding capacities, Shriver (2021) has proposed to call it an enhancement because the aim is to improve the welfare of animals.

In response to these biotechnological developments, burgeoning debates on the ethics of human and animal ‘enhancement’ – as it has generally come to be called even though the appropriateness of this term is disputed – have arisen. With this paper we aim to start ethical discussion about a fourth type of animal enhancement, which we dub ‘remedial enhancement’. Like many anthropocentric animal enhancements, the type of enhancement we have in mind aims to adapt animals to anthropogenic challenges. However, remedial enhancements would be performed for the supposed sake of animal rather than human interests. It is in that respect closer to the type of enhancement proposed by transhumanists, who propose to enhance animals cognitively for the supposed benefit of those animals themselves. However, remedial enhancement does not necessarily require cognitive enhancement and does not presuppose that having enhanced cognitive capacities is good per se – in our view transhumanists employ a narrowly anthropocentric view of what should be considered valuable capacities. The point of remedial enhancement would rather be to enable animals to cope with specific anthropogenic threats to their existence, and this may or may not involve boosting their cognitive capacities. Finally, while

Section 4

disenhancement would supposedly also be in the interests of animals, remedial enhancement would involve ‘improving’ or adding animals’ capacities rather than limiting them.

The concept of remedial enhancement, as we see it, includes (at least) applications in farmed animals as well as wild animals. Gene editing could for example be applied to make farmed animals more resistant to diseases which are prevalent in animal agriculture – either in particular agricultural systems or more generally – or more robust against environmental challenges that result from climate change. Animals living in the wild could also benefit from the latter type of application: some specialized animal species are unable to survive in their original habitat because of changing environmental conditions, which could in principle be halted by increasing the animals’ resilience to these conditions (so called ‘facilitated adaptation’; Palmer, 2016). Moreover, wild animals whose numbers are declining due to predation by or competition with invasive animal species could be adapted genetically to improve their chances of survival and reproduction. It has been argued, for example, that many Australian animal species never had to deal with cunning predators such as cats and foxes until these were introduced by human settlers, and that enhancing the cognitive capacities of the prey species may be necessary to avoid extinction (Rohwer, 2018).

We propose the term ‘remedial’ enhancement to signify that such interventions would aim to help animals facing anthropogenic challenges to deal with those challenges, for the sake of those animals themselves and for reasons of restorative justice. We call this type of intervention an ‘enhancement’ to connect to ongoing ethical debates concerning human and animal ‘enhancement’, and to signify that such interventions would at least *aim* to benefit animals in some respect, but without intending to imply that such intervention do *in fact* benefit animals or are *ultima facie* ethically desirable (see also the next section). In this paper we argue that remedial enhancement merits an ethical debate of its own. Although this debate can draw arguments and perspectives from other (dis)enhancement debates, remedial enhancement arguably differs from anthropocentric animal enhancement, transhumanist animal enhancement, and animal disenhancement in ethically relevant respects. First, however, we need to discuss in what sense the interventions we have in mind can be considered ‘enhancements’.

Defining ‘enhancement’

Although all of the interventions discussed in the previous section have been called ‘enhancements’ by some authors, there is no consensus on how enhancement ought to be defined and, accordingly, no agreement on whether the term ‘enhancement’ properly applies to each of these interventions. This will also affect any discussion of ‘remedial enhancements’: are these called ‘enhancements’ appropriately? We obviously cannot settle the debate on how ‘enhancement’ should be defined, but we can explain how we understand this term and show how this understanding relates to definitions that have been offered by others, taking Shriver (2021) as our main point of reference.

The term ‘enhancement’ has sometimes been used in an attempt to demarcate a class of ethically unacceptable biotechnological interventions. It has then typically been used in opposition to ‘treatment’, which would cover ethically acceptable interventions. Such a strongly normative conceptualization seems unhelpful, however: it implies that the question of whether particular interventions can properly be called ‘enhancements’ can only be settled *after* thorough ethical debate. How such a conceptualization of enhancement serves ethical debate is unclear, in particular because it is generally agreed in human bioethics that there is no strict conceptual distinction between treatment and enhancement on which a strict normative distinction between the two could be based.

At the same time, the term ‘enhancement’ as we understand it does have some normative import. As Burgat (2015) argues, this term is not used univocally across human and animal ethics if it is applied

to interventions that are not performed for the benefit of animals. Because human enhancements are intended to benefit the individuals undergoing the enhancement (or their offspring) and this is the main argument in their favour, Burgat submits that it is misleading to call biotechnological interventions in animals that do not benefit those animals ‘enhancements’. Burgat (2015) goes on to argue that no biotechnological intervention in animals should be called an enhancement: animal ‘enhancement’ would (at least in animal agriculture) only serve animal interests *given* a context that is not in their interest to begin with. We agree that this context is usually not in their interest, but disagree that this excludes applying the concept of enhancement. Some proposed human enhancements also serve humans interests given circumstances that are not in the interest of those who would be enhanced. For example, having certain cognitive capacities enhanced may primarily be important in undesirably competitive labour markets (Pustovrh, 2018). Considering the context and what alternative options it offers is important to determine whether a human or animal enhancement would be (*ultima facie*) ethically desirable, but it does not help ethical debate to set strict normative conditions on the application of the term ‘enhancement’. This becomes even clearer when considering the enhancement of wild animals facing anthropogenic threats such as climate change or invasive species. Although it is not in the interest of most animals to live in an environment that is rapidly changing due to climate change or in which introduced predators decimate members of prey species, it is not clear in these cases that reverting to more favourable circumstances is a realistic or desirable option. Biotechnological interventions that are at least *prima facie* ethically desirable because they aim to benefit animals deserve to be discussed, and discussing these interventions as ‘enhancements’ helps to embed such discussions in wider ethical debates and conveys that these interventions are proposed, at least by some, to benefit animals. However, this choice of words should not be taken to imply that ‘enhancements’ are necessarily *ultima facie* ethically acceptable.

That enhancements must be performed in the supposed interests of the animals themselves (or their offspring) means that they must not merely increase animals’ functional capacities in certain respects, but must pertain to the flourishing of the animal as a whole organism. In Shriver’s (2021) words, animal enhancements must not merely be ‘domain-specific’ but ‘holistic’. Although enhancement as we understand it may involve adapting animals in a limited functional respect, the point must be to benefit the animal as a whole organism. What it means to benefit an animal can be cashed out in a variety of ways. Shriver distinguishes between definitions that conceptualize holistic enhancement in terms of: (1) normal species functioning; (2) welfare; and (3) evolutionary fitness. He argues that normal species functioning and evolutionary fitness are not directly relevant for animals under human supervision, as companion animals and farmed animals are, and that holistic enhancement should hence be conceptualized in terms of increased welfare. Although we agree with Shriver’s argument as applied to animals under human supervision, a conceptualization of enhancement in terms of normal species functioning or evolutionary fitness may be helpful when considering the remedial enhancement of wild animals.

Finally, we disagree with Shriver (2021) that interventions which entail removing or diminishing capacities should properly be called ‘enhancements’ rather than ‘disenhancements’. Defining a disenhancement as a change that has a negative impact on the welfare of the organism, as Shriver does, ignores that disenhancement has always been discussed as a specific type of attempt to improve animal welfare that raises specific ethical conundrums because it involves removing or diminishing animals’ capacities. We prefer to stay closer to the usual application of the terms ‘enhancement’ and ‘disenhancement’, according to which disenhancement implies removing or limiting some animal capacity for the benefit of that animal while enhancement implies improving or adding some capacity for the animal’s benefit (e.g. Thompson, 2008). The distinction between domain-specific and holistic (dis)enhancements can largely accommodate Shriver’s insight that enhancing one capacity may sometimes limit other capacities: such an intervention can be considered ‘mixed’ at a domain-specific level but should still aim to improve the animal’s overall situation.

Section 4

In conclusion, what we call ‘remedial animal enhancements’ can be considered enhancements in the sense that these are biotechnological interventions that add or improve capacities of animals and thereby offer an overall benefit to the animals themselves (or to their offspring). This benefit can be conceptualized in terms of welfare, as Shriver (2021) does, but possibly also in other terms, such as flourishing.

What a debate about remedial animal enhancement can and cannot learn from other (dis)enhancement debates

We submit that what we have called remedial animal enhancement deserves a separate ethical debate. Such a debate can draw on related (dis)enhancement debates, but only to a limited extent, as we show in this section.

First, even though the word ‘enhancement’ seems inappropriate here, debates on anthropocentric animal ‘enhancements’ might offer relevant arguments and perspectives for ethical debates on remedial animal enhancement. Some arguments concluding that animals should not be ‘enhanced’ for human benefit can perhaps be extended to debates on remedial animal enhancements, especially if these arguments go ‘beyond welfare’: one could perhaps argue, for example, that remedial enhancement violates animals’ integrity, is unnatural, or comes down to ‘playing God’. Such arguments have been more in focus in the animal disenchantment debate, however, and ethical debate is at any rate required to settle whether such arguments trump arguments referring to how animals would supposedly be benefitted by remedial enhancements.

Second, the debate around what we have called ‘transhumanist’ animal enhancement may seem relevant because these enhancements *would* be performed in the supposed interest of animals. However, the type of benefit that would be conferred to animals differs significantly between transhumanist and remedial animal enhancement, and this limits the relevance of debates on the former for debates on the latter. Transhumanists (e.g. Dvorsky, 2008) have been arguing that humans have a duty to enhance animals’ cognitive capacities, as this would significantly improve those animals’ lives, which has been contested by authors (e.g. Hauskeller, 2016) who object that transhumanists fail to appreciate animals’ ‘animalness’ and paternalistically assume that they know that it would be best for animals to have more human-like mental faculties. This discussion seems relevant only for remedial enhancements that would significantly change the animal’s cognition, for example when greatly improving the intelligence of animals who are being preyed by invasive species (Rohwer, 2018).

Third, although debates around animal disenchantment (as we understand it) concern biotechnological interventions that would remove or limit animal capacities and remedial enhancement consists in adding or improving certain capacities, the connection is again that both types of intervention would be performed for the supposed benefit of animals. At first sight, the relevance of disenchantment debates may seem limited, as precisely the *removal* or *diminishment* of animal capacities is often considered intuitively objectionable about disenchantment (e.g. Thompson, 2008). However, some concepts that have been developed and applied to articulate intuitive concerns with disenchantment – such as *telos* and integrity – do seem to be applicable to changes to animals more generally. A debate on remedial enhancement could thus draw concepts from the disenchantment debate and address to what extent applying these concepts leads to valid ethical concerns about remedial enhancement.

The disenchantment debate also includes a relevant discussion on what can be called ‘non-ideal’ and ‘ideal’ solutions to animal suffering (Schultz-Bergin, 2014). Roughly put, there is agreement that disenchantment is not the ideal solution to animal suffering in animal agriculture and animal experimentation: ending these practices or at least adapting them much more to the needs of animals would be more ethical. However, some argue that these ethically preferable solutions are unrealistic on

the short and the middle-long term and that we therefore have a duty to develop methods to disenchant animals – as a second-best but more realistic alternative – while others object to this type of argument as these interventions would bring us further away from the ideal situation. This type of discussion is also likely to occupy debates on remedial enhancement. When thinking about increasing farmed animals' resistance to some disease or their resilience against environmental stress, for example, some may argue that changing the animals' living conditions is ethically preferable. This is a valid suggestion, but there may be remedial enhancements for which changing living conditions is not a realistic alternative on the short and middle-long term. First, some agricultural animal diseases (e.g. PRRS, porcine reproductive and respiratory syndrome) are prevalent in a wide range of husbandry systems. If so, only the abolition of or a quite radical change in animal husbandry practices would actually be an effective alternative to animal enhancement, a change which may not be realistic. Second, wild animals face environmental challenges that, although they are anthropogenic, are difficult for humans to remove. Even if human societies succeed in reversing climate change, for example, this will presumably take many decades, and many animal species may go extinct in the meantime. There may, however, be other alternatives to animal enhancement, such as assisted migration of members of endangered species to more favourable environments. Ethical debate on remedial animal enhancement should in any case address whether potential alternatives are both ethically preferable *and* realistic, and if not, whether enhancement is perhaps acceptable as a 'non-ideal' solution.

Finally, a debate on remedial animal enhancement may be able to draw on a debate that does not concern non-human animals at all: the human enhancement debate. Although there clearly are ethically salient differences between human and remedial animal enhancement, the human enhancement debate is more advanced than animal (dis)enhancement debates and may include ethical concepts and perspectives that can be extended to remedial animal enhancement. Without claiming completeness, one relevant perspective from the human enhancement debate is that some enhancements bring only 'positional' goods, meaning that a capacity is increased that brings only benefits *relative to* unenhanced people (Bognar, 2012). The standard example is height: although taller people experience some advantages over shorter people, there is no net benefit in biotechnologically creating taller people. The relative advantages that would accrue to 'enhanced' people would be offset by the relative disadvantages experienced by 'unenhanced' people, and making everyone taller would cancel out any relative advantages associated with increased height. Debates on remedial enhancement should arguably address whether particular interventions do offer an overall benefit across all morally considerable parties, or whether the enhancement would instantiate a zero-sum game or even a negative-sum game. Some remedial enhancements may offer what might be called 'intraspecies positional benefits' or what might be called 'interspecies positional benefits'. Having certain capacities enhanced may give some animals a competitive edge over their conspecifics; similarly, enhancing members of prey species may give them an advantage relative to members of predatory species. Whether the enhancement offers a net benefit overall is relevant in both cases. Other relevant perspectives from the human enhancement debate – which we have no space to further elaborate here – may be that enhancements can threaten the 'authenticity' or 'nature' of those who are enhanced or that they violate the 'giftedness of life'. Are animals who have been enhanced still authentic members of their species? Would we be turning animals that we enhance into (partial) artefacts, thereby losing a sense of giftedness?

Conclusions

We have argued that an ethical debate about remedial animal enhancement may draw relevant perspectives from other (dis)enhancement debates but cannot coincide with any of these debates, because the context in which remedial enhancement is proposed is different and this leads to different moral concerns. Remedial enhancement intuitively seems to be the most acceptable form of animal (dis)enhancement, as it not only serves the welfare or even the continued existence of the animals without

Section 4

removing or limiting their capacities, but also partially restores harms that we humans have caused to (previous generations of) these animals. It is all but clear that remedial animal enhancement is *ultima facie* desirable, however, which calls for ethical debate.

One question remains. Why is a debate on remedial animal enhancement necessary at all? Why not discuss particular interventions such as improving farmed animals' disease resistance or improving wild animals' resilience against climate change separately instead? Although it remains important to discuss ethical issues associated with particular biotechnological interventions, discussing these *as* enhancements embeds them in wider bioethical debates, from which relevant perspectives and arguments can be derived. For example, regarding interventions in wild animals as enhancements suggested that arguments surrounding positional goods might be relevant. Moreover, by seeing these interventions as instantiations of a class of 'enhancements', they can be positioned in wider developments or tendencies that are ethically significant, including a tendency towards 'interventionism'.

References

- Bognar, G. (2012). Enhancement and equality. *Ethical Perspectives* 19(1): 11-23.
- Burgat, F. (2015). Improving animals, improving humans: transpositions and comparisons. In: Bateman, S., Gayon, J., Allouche, S., Goffette, J. and Marzano, M. (eds.). *Inquiring into animal enhancement: model or countermodel of human enhancement?* Palgrave Macmillan, Basingstoke, UK, pp. 34-48.
- Dvorsky, G. (2008). All together now: developmental and ethical considerations for bio-logically uplifting nonhuman animals. *Journal of Evolution and Technology* 18(1): 129-142.
- Hauskeller (2016). *Mythologies of transhumanism*. Palgrave Macmillan, Basingstoke, UK, 255 pp.
- Palmer, C. (2016). Saving species but losing wildness: should we genetically adapt wild animal species to help them respond to climate change? *Midwest Studies in Philosophy* KL: 234-251.
- Pustovrh, T., Mali, F. and Arnaldi, S. (2018). Are better workers also better humans? On pharmacological cognitive enhancement in the workplace and conflicting societal domains, *Nanoethics* 12: 301-313
- Rohwer, Y. (2018). A duty to cognitively enhance animals. *Environmental Values* 27: 137-158.
- Schultz-Bergin (2014). Making better sense of animal disenchantment: a reply to Henschke. *Nanoethics* 8: 101-109.
- Shriver, A. (2021). The welfarist account of disenchantment as applied to nonhuman animals. In: Bovenkerk, B. and Keulartz, J. (eds) *Animals in our midst: the challenges of co-existing with animals in the anthropocene*. Springer, Cham, Switzerland, pp. 533-544.
- Thompson, P. (2008). The opposite of human enhancement: nanotechnology and the blind chicken problem. *Nanoethics* 2: 305-316.

31. Identifying social and ethical aspects of feeding raw meat-based diets to dogs

N. Ciecierska-Holmes^{1,2}

¹School of Humanities, University of Adelaide, Napier Building, North Terrace, The University of Adelaide, SA 5005, Australia; ²School of Sociology and Social Policy, University of Nottingham, Law and Social Sciences Building, University Park, NG7 2RD, United Kingdom; natalia.ciecierska-holmes@nottingham.ac.uk

Abstract

Among the many novel diets for companion animals, raw meat-based diets (RMBD) have become an increasingly popular alternative for dogs in recent years. Often promoted as alternatives to conventional kibble diets, RMBDs are broadly described as both commercial and homemade diets for companion animals that include fresh and uncooked 'meat' ingredients from farmed or wild animals (Freeman *et al.*, 2013). Despite their popularity, RMBDs remain controversial, dividing those who advocate the diets and those who raise significant concerns about raw feeding. Many scientific studies document issues with nutritional completeness as well as health and safety risks. The handful of studies that explore owner perspectives around raw feeding investigate perceptions of health and safety and motivations to feed raw. Yet, this research overlooks the social and ethical aspects of raw feeding, which can probe deeper into not just why, but also how decisions to feed RMBDs are made. This paper reviews previous literature on raw feeding and identifies gaps in this research that could be addressed by employing sociological approaches from the field of human-companion animal relations. This can help expand understandings of raw feeding beyond health and nutrition to incorporate broader social and ethical relations between dogs and their guardians. The paper first draws on available veterinary and scientific literature on raw feeding which highlights concerns regarding nutrition and public health and identifies gaps in the existing literature. Second, it highlights scholarship on human-companion relations, particularly regarding concepts of care and identity, in order to understand dog guardians' moral perspectives around raw feeding in relation to their own diets. Finally, the paper will set up an approach for conducting an empirical study investigating social and ethical aspects of raw feeding through cross-cultural fieldwork with guardians and their dogs in the UK and Australia.

Keywords: human-animal relations, pet food, feeding, alternative diets

Introduction: humanisation and the premiumisation of pet food

Human relationships with companion animals (CA) have undergone significant shifts in recent years. The 'humanisation' of CAs has resulted in their incorporation into family structures and there are increasingly viewed as family members or kin (Charles and Davies, 2008; Haraway, 2008). Moreover, many guardians feel a sense of responsibility for their health and well-being. This has corresponded with the commercialisation of the CA industry and a rise in the number and diversity of pet products available (Nast, 2006; Fox and Gee, 2016). Pet food is the most dominant sector of the CA market, with Brits spending £3.2 billion in 2021 (PFMA, 2021).

Since the rise of the commercial pet food industry in the 20th century, the majority of CAs in industrialised countries have been fed commercial pet food, which is produced using farmed animal by-products from the human food production system that are deemed unsuitable for human consumption. In recent years, however, premium products and so-called 'alternative diets', such as raw meat-based diets (RMBDs) and vegetarian diets have become more popular (Dodd *et al.*, 2020). Often marketed

Section 4

as 'natural', 'human-grade', 'healthy' and 'ethical' alternatives to conventional kibble diets, commercial and homemade RMBDs contain high proportions of uncooked 'meat' ingredients that can be fresh, frozen or freeze-dried. In the UK, it is estimated that approximately 12.5 million dogs were kept as pets in 2021 (Statista, 2022). A recent survey by Dodd *et al.* (2020) found that 66% of Brits in their study sample included raw meat in their dog's diet and 11% fed raw exclusively. Although there are no directly comparable statistics, this would suggest over 1.3 million dogs in the UK are exclusively fed RMBDs.

Considering the extent of RMBDs and controversy surrounding them, this paper sets out an initial review of the current scientific literature on raw feeding and identify gaps in this research that could be addressed through the use of sociological approaches from the field of human-CA relations. This scoping work is intended to extend understandings of raw feeding beyond health and nutrition alone by exploring broader social and ethical relations between dogs and their guardians. As such, this paper aims to examine conceptions of raw feeding by drawing on sociological theory and related qualitative studies which have examined human-companion relations. Of particular interest are the concepts of care and identity which are explored in order to understand dog guardians' moral perspectives around raw feeding in relation to their own diets. Finally, this paper sets up an approach for conducting an empirical study investigating social and ethical aspects of raw feeding through cross-cultural fieldwork with guardians and their dogs in the UK and Australia.

Nutrition and animal science research on raw feeding

Nutrition, health and safety: scientific and guardian perspectives

Despite the increasing popularity of raw feeding for CAs, it has been met with controversy in veterinary science and practice. Most research in relation to raw feeding has been addressed from nutrition and animal science perspectives and investigates, nutrition, public health issues and owner perspectives of raw feeding. While some concerns focus on the completeness of raw diets and nutritional imbalances in home-made recipes (Pedrinelli *et al.*, 2017), there is a more pervasive view that RMBDs present health and safety risks. A large number of studies have addressed the increased risks of pathogenic microorganisms present in RMBDs, which pose concerns for both human and non-human animal health (see for example, Finley *et al.*, 2008; van Bree *et al.*, 2018; Helligren *et al.*, 2019; Nüesch-Inderbinnen *et al.*, 2019). It is interesting, therefore, that raw-feeding guardians perceive both commercial and homemade RMBDs as highly nutritious and largely do not see RMBDs as a risk to human or non-human animal health (Empert-Gallegos *et al.*, 2020; Morelli *et al.*, 2019). Moreover, guardians have expressed confusion and disagreement around what appropriate food safety practices entails (Bulochova and Evans, 2021). In sum, while these studies highlight incongruences between concerns from the scientific community and the perceptions of raw feeders regarding nutrition and safety, health promotion from a nutritional or animal science perspective alone does not capture why raw feeders choose this diet in the first place.

Owner motivations and knowledge

Despite the abundance of research that highlights the issues with raw feeding, its increasing popularity has shifted attention to owners' motivations and the perceived benefits. Findings from a handful of existing quantitative studies from animal and nutrition sciences indicate that the most significant motivating factors for feeding RMBDs are pet health and visible physiological benefits, such as shinier coats or better teeth; concerns with and lack of trust in commercial pet food; perceived naturalness; and their dog's carnivorous nature (Empert-Gallegos *et al.*, 2020; Morelli *et al.*, 2019; Morgan *et al.*, 2017; Bulochova and Evans, 2021). This is often contrasted with the perceived drawback of commercial pet food, such as a lack of ingredient information, the inclusion of additives, the presence of carbohydrates, the speed at which their dog consumes meals and palatability (Morelli *et al.*, 2019: 3).

Research gaps

While there is interesting research on aspects of raw feeding, there are absences in this literature. Despite calls for approaches that can develop understandings of social and cultural aspects and meaning-making of human-CA food consumption (Michel, 2006 p.1280), nutritional science perspectives still dominate the literature on alternative diets for CAs. Moreover, although owner perspective studies build on safety and nutrition studies by highlighting owner motivations for feeding RMBDs, these approaches face several limitations. First, the narrow focus on pre-selected motivations for raw feeding does not sufficiently take into consideration constructions of responsibility and care, and the human-CA bond. Second, in part due to the quantitative approaches employed, they lack depth in understanding human-non-human animal and food identities that could expand our comprehension of concepts, such as ‘naturalness’ and perceptions of dogs as ‘carnivores’. Third, the absence of relational approaches that explore human-dog diets and examine normative underpinnings forecloses an analysis of possible tensions and conflicts that might arise regarding food choices. Therefore, health and nutrition perspectives could be complemented by qualitative sociological approaches to human-companion relations that address care, identity and ethical perspectives around raw feeding in relation to caretakers’ own diets. This is particularly relevant in the context of both changing dietary practices and shifting relations with CAs.

Identifying social and ethical relations: care, identities and moral complexity

This paper argues that raw feeding opens a window into human-CA relations and food-related values. In addition to the increasing humanisation of companions and the commercialisation and premiumisation of the CA industry, we are also witnessing changing conceptions of care, increasing discussions of food choices in ethical terms and alternative forms of companionship (Fox and Gee, 2016). Feeding CAs is both an expression of care as well as an expression of human and non-human animal identities and values regarding what constitutes appropriate food. In contexts where family members are no longer perceived only as ‘human’, this gives rise to tensions and ethical considerations around food choices.

Feeding dogs as an expression of care

Sociological literature is well positioned to conceptualise the feeding of dogs as an expression of care. Conceptions of care have shifted perceptions of ‘pets’ to ‘CAs’ and ‘owners’ to ‘caretakers’ and ‘guardians’ (Franklin, 1999: 86). CAs are dependent on their human guardians for food, many of whom are using increased nutritional knowledge to make careful decisions regarding their diets (Cudworth, 2016). Taking care through food may be an attempt to increase the human-CA bond, particularly in the preparation of homemade diets (Dodd *et al.*, 2020). Care is a performative activity, such that the performances of care in relation with other beings has the potential to create ‘caring moral identities’ (Hamington, 2017: 52).

Feeding dogs as an expression of identities and values

Drawing on sociological research that explores the role of CAs as expressions of social identity, this work draws on the assertion that guardians express their identities through food choices for their dogs. On the one hand, the concept of humanisation supposes that decisions around feeding are anthropomorphised, with a transfer of practices and values from guardians to CAs. For example, findings from US-based studies have indicated that raw feeders are strongly driven by ideological rationale, such as the impact of pet food on the environment, and they are more likely to select organic products for themselves (Lenz *et al.*, 2009). Similarly, people who purchase organic food for themselves are more likely to purchase ‘premium’ pet food (Kumcu and Woolverton, 2015). On the other hand, guardians may define their dog’s identity through their diet (Michel, 2006). Raw feeding enables guardians to assume caring moral

Section 4

identities which simultaneously challenge dominant narratives around food and non-human animals. It is possible to view raw feeding as a critique of mainstream discourses around food and health for CAs and conceptions of animals requiring a 'natural' and 'biologically appropriate' diet. The supposed carnivorous nature of dogs, derived from their ancestry with wolves, is a motivating factor for many guardians who feed RMBDs, however, this falls in danger of biological essentialism (Cudworth, 2016: 235). These trends fall under what is deemed a new and emerging relation of 'alternative companionship', which requires further investigation (Fox and Gee, 2016).

Feeding dogs as an expression of ethics

Questions of identity connect with questions around morality since it is likely there will be both an alignment of values as well as ethical tensions and contradictions in the act of feeding dogs. A significant contradiction concerns loving some animals and killing others for food (Joy, 2020). Relational approaches to human-CA feeding can be found in empirical literature from the fields of social psychology and food ethics that have explored the values and practices of vegetarian and vegan dog guardians. Guardians following a plant-based diet may face ethical conflicts and guilt regarding animal welfare – named the 'vegetarian's dilemma' (Rothgerber, 2013) – when feeding animal-based diets to their companions (Milburn, 2017). This has been unpacked by Erika Cudworth, whose qualitative investigation of carnism – 'the belief system that conditions us to eat certain animals' (Joy, 2020: p. 19) – and CA feeding revealed antagonisms, anxieties and gradients of ethical choices for veg(etari)an owners who feed dogs meat, thus highlighting the ambivalences of 'ethical relating' (Cudworth, 2016: 240). While focused on conventional meat-based diets, theorising relations between human and dogs' diets could benefit from an explicitly bounded case study focusing on *raw* feeding. RMBDs provide additional conflicts, because the increasing demand for 'premium' pet food containing 'human-grade' meat is pitting pet food in direct competition with the human food system (Deng and Swanson, 2015), thus driving up the environmental impact of CAs (Okin, 2017).

Consequently, raw feeding has ethical implications due to the ambivalences enmeshed in care, responsibility and identities involved in human-CA relations. Relational approaches to health and well-being have acknowledged the moral complexity of 'multispecies co-flourishing' that requires 'simultaneous, contradictory truths' (Haraway, 2008: 105). Health is not simply given, but rather 'multi-species well-being' can be both assisted and harmed by deep and complex social relations between humans and non-human animals (Brown and Nading, 2019: 5). Rather than ethics as an abstract code, a descriptive and 'situated ethics' approach to feeding animals is proposed, which can attend to the 'ambiguities and ambivalences of living with non-humans' (Ginn, 2014: 532). This draws on a tradition in feminist work that has focused on the ethical everyday or doing of life (Haraway, 2008).

Empirical investigation and conclusion

In light of the issues presented, there is need for a more in-depth study which explores broader social and ethical relations around feeding CAs in different contexts. This work will hence be taken forward through a cross-cultural project exploring the phenomenon of raw feeding for dogs in the UK and Australia. Through empirical work with guardians who follow a plant-based diet and feed their dogs RMBDs, the project aims to investigate the values, ethical complexities and relations that arise from living and eating with CAs. The justification for this focus is twofold. First, raw feeding has not been sufficiently understood in terms of converging and discrepant dietary practices between humans and their dogs. In addition, focus on this population permits exploration of ethical perspectives around raw feeding associated with potential conflicts, such as animal welfare *and* environmental impact, created by these two diets co-existing within the same household. The project employs mixed qualitative methods, combining more traditional semi-structured interviews with creative 'more-than-talk' methodologies.

The findings will be of practical relevance to veterinary professionals and relevant associations as it aims to inform professionals who play a pivotal role in providing dietary advice to guardians. With the steady increase in the adoption of plant-based diets globally (The Vegan Society, 2021), understanding ethical constructions and practices around the increasing prevalence of RMBDs for dogs can inform us about (post-human) food system transitions towards plant-based alternatives.

Acknowledgements

This research project is supported by the University of Adelaide, Australia. I would like to thank my supervisors Professor Pru Hobson-West and Professor Kate Millar from the University of Nottingham, and Professor Rachel Ankeny and Dr Michelle Phillipov from the University of Adelaide, for their time, expertise and feedback in the development of this project and writing of this paper.

References

- Brown H and Nading AM (2019) Introduction: Human Animal Health in Medical Anthropology. *Medical Anthropology Quarterly* 33(1): 5-23.
- Bulochova V and Evans EW (2021) Raw Meat-Based Pet Feeding and Food Safety: Netnography Study of Pet Owner Comments and Review of Manufacturers' Information Provision. *Journal of Food Protection*. DOI: 10.4315/jfp-21-158.
- Charles N and Davies CA (2008) My Family and Other Animals: Pets as Kin. *Sociological research online* 13(5): 1-14.
- Cudworth E (2016) 12 On Ambivalence and Resistance: Carnism and Diet in Multi-species Households. Leiden, The Netherlands: Brill, pp.222-242.
- Deng P and Swanson KS (2015) CAS Symposium: Future aspects and perceptions of CA nutrition and sustainability1,2. *Journal of Animal Science* 93(3): 823-834.
- Dodd S, Cave N, Abood S et al. (2020) An observational study of pet feeding practices and how these have changed between 2008 and 2018. *Veterinary Record* 186(19): 643-643.
- Empert-Gallegos A, Hill S and Yam PS (2020) Insights into dog owner perspectives on risks, benefits, and nutritional value of raw diets compared to commercial cooked diets. *PeerJ*. PeerJ Inc.
- Finley R, Reid-Smith R, Ribble C et al. (2008) The Occurrence and Antimicrobial Susceptibility of Salmonellae Isolated from Commercially Available Canine Raw Food Diets in Three Canadian Cities. *Zoonoses and public health* 55(8-10): 462-469.
- Fox R (2006) Animal behaviours, post-human lives: everyday negotiations of the animal-human divide in pet-keeping. *Social & cultural geography* 7(4): 525-537.
- Fox R and Gee NR (2016) Changing Conceptions of Care. *Society & animals* 24(2): 107-128.
- Franklin A (1999) *Animals and modern cultures: a sociology of human-animal relations in modernity* / Adrian Franklin. London: London: Sage Publications.
- Freeman LM, Chandler ML, Hamper BA et al. (2013) Current knowledge about the risks and benefits of raw meat-based diets for dogs and cats. *Journal of the American Veterinary Medical Association* 243(11): 1549-1558.
- Ginn F (2014) Sticky lives: slugs, detachment and more-than-human ethics in the garden. *Transactions – Institute of British Geographers* (1965) 39(4): 532-544.
- Hamington M (2017) *Care, Moral Progress, and CAs. Pets and People*. New York: Oxford University Press.
- Haraway DJ (2008) *When species meet* / Donna J. Haraway. Minneapolis: Minneapolis: University of Minnesota Press.
- Hellgren J, Hästö LS, Wikström C et al. (2019) Occurrence of Salmonella, Campylobacter, Clostridium and Enterobacteriaceae in raw meat-based diets for dogs. *Veterinary Record* 184(14): 442-442.
- Kumcu A and Woolverton AE (2015) Feeding Fido: Changing Consumer Food Preferences Bring Pets to the Table. *Journal of food products marketing* 21(2): 213-230.
- Lenz J, Joffe D, Kauffman M et al. (2009) Perceptions, practices, and consequences associated with foodborne pathogens and the feeding of raw meat to dogs. *The Canadian veterinary journal = La revue veterinaire canadienne* 50(6): 637-643.

Section 4

- Michel KE (2006) Unconventional Diets for Dogs and Cats. *Veterinary Clinics of North America – Small Animal Practice*. 1269-1281.
- Milburn J (2017) *The Animal Lovers' Paradox?* New York: New York: Oxford University Press.
- Morelli G, Bastianello S, Catellani P et al. (2019) Raw meat-based diets for dogs: Survey of owners' motivations, attitudes and practices. *BMC Veterinary Research* 15(1).
- Morgan SK, Willis S and Shepherd ML (2017) Survey of owner motivations and veterinary input of owners feeding diets containing raw animal products. *PeerJ*. PeerJ Inc., e3031.
- Nast HJ (2006) Loving... whatever: Alienation, neoliberalism and pet-love in the twenty-first century. *ACME: An International Journal for Critical Geographies* 5(2): 300-327.
- Nüesch-Inderbinen M, Treier A, Zurfluh K et al. (2019) Raw meat-based diets for CAs: a potential source of transmission of pathogenic and antimicrobial-resistant Enterobacteriaceae. *Royal Society Open Science* 6(10): 191170-191170.
- Okin GS (2017) Environmental impacts of food consumption by dogs and cats. *PLOS ONE* 12(8): e0181301-e0181301.
- Pedrinelli V, Gomes MDOS and Carciofi AC (2017) Analysis of recipes of home-prepared diets for dogs and cats published in Portuguese. *Journal of Nutritional Science*. DOI: 10.1017/jns.2017.31.
- PFMA (2021) PFMA releases latest Pet Population Data. Available at: <https://www.pfma.org.uk/news/pfma-releases-latest-pet-population-data>.
- Rothgerber H (2013) A meaty matter. *Pet diet and the vegetarian's dilemma*. *Appetite* 68: 76-82.
- Sanders CR (1990) The Animal 'Other': Self Definition, Social Identity, and CAs. *Advances in consumer research* 17: 662.
- Statista (2022) Dog population in the UK 2021 | Statista. Available at: <https://www.statista.com/statistics/515379/dogs-population-in-the-united-kingdom-uk/> (accessed 2.1.22).
- Van Bree FPJ, Bokken GCAM, Mineur R et al. (2018) Zoonotic bacteria and parasites found in raw meat-based diets for cats and dogs. *Veterinary Record* 182(2): 50-50.

32. The problem of justifying animal-friendly animal husbandry

K. Deininger^{1,2}

¹University of Vienna, Department of Philosophy, Vienna Doctoral School of Philosophy, Universitätsstraße 7, 1010 Vienna, Austria; ²Messerli Research Institute, Unit of Ethics and Human-Animal Studies, University of Veterinary Medicine, Vienna, Medical University of Vienna, University of Vienna, Veterinärplatz 1, 1210 Vienna, Austria; konstantin.deininger@vetmeduni.ac.at

Abstract

Intense or industrial animal husbandry is morally bad. This consensus in animal ethics led to the emergence of veganism which is recently in decline in favour of ‘conscientious carnivorism’ which advocates eating animal products from animal-friendly animal husbandry in response to the moral problems of industrial farming. Advocates of animal-friendly husbandry justify rearing and killing ‘happy animals’ by highlighting that the animals live pleasant lives and would not have existed if not reared for human consumption. In this paper, I tackle this ‘logic of the larder’ by showing that it serves as a purification strategy to conceal the harm that animals experience in this alleged animal-friendly type of farming. Defenders of ‘happy meat’ claim that animal-friendly animal husbandry is in the animals’ best interests and that it is in effect a ‘win-win situation’ for humans and farm animals alike. Departing from two critics of animal-friendly animal husbandry, I will show that the problem of this logic is that it evades the fact that moral residuals, which is the experienced harm by the animals, remain by this practice. Even if there may be strong reasons for the consumption of meat and derivatives of ‘happy animals’, the experienced harm for the animals will not be extinguished. I will denote the detachment that derives from the strategy of rendering the animals’ experienced harm in animal-friendly animal husbandry invisible as guilt. I will conclude that instead of purifying eating animals the ‘good way’, we should face the responsibility we have when killing ‘happy animals’ for ‘happy meat’.

Keywords: ethics of eating meat, happy meat, logic of the larder, guilt

Introduction

Intense or industrial animal husbandry is morally bad. This statement reflects, except from a few exceptions (e.g. Hsiao, 2017), a consensus in animal ethics. The adverse effects of intense animal husbandry are far reaching and include, besides the harm to animals, negative impacts on the environment and climate or the threat of global influenza pandemic – to name just a few (for an exhaustive critique of the adverse effects of industrial animal farming see Rossi and Garner, 2014). An often-discussed alternative to industrial farming and concentrated animal feeding operations (CAFO) is veganism, which advocates the rejection of eating meat and other animal products, and eventually the abolition of animal husbandry *per se* (e.g. Gruen and Jones, 2016). But this position is recently in decline in favour of what can be called ‘conscientious carnivorism’ (Scruton, 2004) or ‘virtuous omnivorism’ (Bobier, 2021) which advocates eating animal products from animal-friendly animal husbandry (Milburn and Bobier, 2022), a type of farming that aims at avoiding the adverse effects of industrial farming, above all: the harms to animals. Conscientious carnivorism is advocated as a practice that benefits the farm animals and some even claim that it is our duty to eat such produced meat since it favours the animals’ welfare (Zangwill, 2021).

The common justification of animal-friendly animal husbandry (in the following: AFAH) is simple and straightforward, as Tatjana Višak sums up:

Section 4

[T]he animals are granted pleasant lives, usually in connection with the claim that they would not exist at all if it were not for the purpose of our consumption. By consuming and farming animals, we are actually enabling their existence and granting them a pleasant life, which seems better than not existing at all. (Višak, 2013: 1)

Accordingly, eating meat from AFAH is seen as morally good: the animals live a 'happy life' – except from the 'one bad day' of slaughter – and humans must not refrain from the habit of eating meat. The 'win-win situation' that defenders of AFAH advocate results from a kind of moral thinking that tries to neutralize, or better *purify*, the negative effects if the expected outcome is positive: animals in AFAH lead a happy life and would not have existed if not reared for human ends. Additionally, humans profit from high-quality animal products. Seemingly, no moral residuals remain.

Contrary to this view I will argue in this paper that the justification of AFAH is flawed as the positive effects that result for human beings by consuming animal flesh or milk or eggs from AFAH will not neutralize the harm experienced by the animals when killed. Evading responsibility by excusing the animals' experienced harm with the animals' seemingly 'happy lives' does not neutralize the harm, and in any case moral residuals remain.

In the following, I will discuss the rationale that renders AFAH as morally viable. I then consider two critical voices on AFAH which I subsequently contrast with a concept of guilt which is basically the claim that there is no redemption of animal suffering. The aim of the paper is to argue for the conception of guilt as a way to criticize the purification strategy that underwrites the conception of AFAH.

Justifying animal-friendly animal husbandry

The justification – or rather: the purification – of AFAH is closely connected to what Henry S. Salt coined as the 'logic of the larder' which was originally formulated by Leslie Stephen in this polemic statement from 1896: 'Of all the arguments for Vegetarianism none is so weak as the argument from humanity. The pig has a stronger interest than anyone in the demand for bacon. If all the world were Jewish, there would be no pigs at all' (Stephen in Salt, 1976: 186). According to this, the pig should be happy to be eaten as it would not have even existed was it not for man's demand on her or his flesh. It should be in the pig's best interest to be eaten. Further, man does not only benefit the pig who will be slaughtered but also the next animal that replaces the killed one, whereas the latter is given the opportunity to live a happy life, which would not be the case if the former was not killed.

Probably, many would feel repugnant to the formulation of Stephen's statement. But in essence, it reflects the justification strategy that advocates of AFAH employ and which is echoed in Višak's citation further above. It also reflects the idea that animals benefit from farming and that a good, harm-free consumer-farmer-animal relationship is possible. In fact, this is what many organic food stores advertise as animal-friendly produced meat (or derivatives such as milk and eggs). Animal-friendly commercials and labels reassure the consumers that the animals are well off on the farms.

The idea of AFAH as presented here serves as a kind of 'confessional booth'. It is not debated that the animals have something to lose: their lives. But the 'happy lives' of the animals overall neutralize the harm that the animals experience. Eating 'happy meat' is seemingly a guilt-free endeavour, it is morally purified according to Stephen and his followers. And I think that precisely in this respect the logic of AFAH is flawed as it is not a guilt-free practice. Before proposing a critique of AFAH that relates to the concept of guilt, I will briefly discuss two critics of animal-friendly animal farming.

Critics of animal-friendly animal husbandry

According to Peter Singer, the logic of AFAH cumulates in ‘the replaceability argument’ ‘for it assumes that if we kill one animal, we can replace it with another as long as that other will lead a life as pleasant as the one killed would have led, if it had been allowed to go on living’ (Singer, 2011: 106). This argument does not apply to industrial farming as the animals do not live a pleasant life there, but it seemingly applies to animals who lead ‘happy lives’ as is echoed in the justification of AFAH. However, by accepting the replaceability argument, one runs into this problem: people might be replaceable too! Humans might be, for example, reared for organ banking and will be later replaced with other humans who lead at least as happy lives as the replaced ones (Singer, 2011: 107).

To avoid this repugnant conclusion, Singer states that only ‘merely conscious beings’ are replaceable: ‘The merely conscious being does not have a preference for continued life. ... Killing does not thwart more desires than putting the being asleep’ (Singer, 2011: 86). So, merely conscious beings do not have any *personal* interest in continuing their lives and are thus replaceable (Singer, 2011: 119). But this does not apply to humans and to the animals that are reared in AFAH such as pigs, cattle and poultry. They are not merely conscious but intelligent, rational and self-aware to different degrees and have strong interest in continuing their lives – thus, replacing them is not allowed and consequently AFAH as presented here should be rejected.

Višak (2013) rejects Singer’s argumentation as animals are always worse off when killed and slaughter cannot be compensated by bringing a new animal into existence. Her main critique is that beings cannot just be replaced by other beings with the same expected amount of welfare. Singer’s account allows for replaceability as his conception of welfare is not fixed to particular individuals. Rather, welfare is *impersonal*: ‘It is as if sentient beings are receptacles of something valuable, and it does not matter if a receptacle gets broken so long as there is another receptacle to which the contents can be transferred without any getting spilt’ (Singer, 2011: 106). Višak rejects that view and claims that something must be good or bad *for* someone; welfare always affects someone. So, she ‘does not accept that bringing into existence can benefit a being. Killing a being that could otherwise have had a pleasant life, harms that being’ (Višak, 2013: 145). Consequently, ‘happy farm animals’ are not replaceable.

In effect, both, Singer and Višak reject AFAH as it cannot account for the welfare lost – be it impersonal or personal. But Singer and Višak approach the problem in a detached and abstract manner, calculating and contrasting possible welfare outcomes. For Višak, however, a welfare loss remains if a being is killed, and this loss cannot be compensated. While Višak aims at rejecting the possibility of replaceability, I am interested in the moral residuals that remain if a being is harmed. In the next section, I will propose an alternative to Singer and what could be seen as a supplement to Višak, in outlining a concept of guilt that takes moral residuals seriously.

Animal-friendly animal husbandry and the concept of guilt

One thing is certain: animals who are slaughtered experience an early, violent death that is *not* natural (Pluhar, 2010: 462). Some advocates of AFAH might nevertheless suggest that there are forms of killing which are ‘species-appropriate’ and do not involve pain for the animals like pasture-shots on free-ranging cattle:

Take a cow, let her enjoy the last moments of bliss in the same fields where she was raised, and then pull the trigger on her from a deer stand a few yards away. The rest of the herd looks around, but doesn’t panic, and then gets back to grazing. Lock, stock and smoking barrel.
(Western Farm Press, 2013)

Section 4

However, it is hard to assume that regular slaughter methods do not produce any stress for the animals: usually, animals are separated from their groups, and mammals with pronounced social behaviour like pigs and cows probably experience fear and distress from being separated from their group for slaughter. Slaughter without negative side effects seems rather to be a theoretical construct and does not correlate with most slaughter practices. So, it can be assumed that slaughter is a harm for the animals. Call this experienced harm a 'moral residual'.

Moral residual(s) are fundamental to my – admittedly peculiar – conception of guilt. If someone performs an action that results in harms for some being(s), she creates something that cannot be compensated but that remains: a rest, a moral residual. This person is then guilty of having caused harm. This perspective makes purification strategies impossible as it draws attention to the experienced harm that remains as a moral residual. Let me illustrate this with an example: Someone is stranded on an island and must hunt and fish to survive. One might be inclined to purify these actions as they guarantee the survival of the stranded individual – she could not have managed this otherwise. But nevertheless, the animals lost their lives and (possibly) pleasant futures, and their killing was maybe also accompanied with considerable suffering if the stranded was not an experienced hunter or fisher. The harm experienced by the animals remains and the stranded becomes guilty for her actions.

Note that in this example strong reasons are given to conduct the actions. Killing animals by hunting and fishing was necessary for survival. But this 'fact' does not purify the actions. Rather, the circumstances give reasons to produce harm which creates moral residuals. What I denote as 'guilt', then, is the production of these moral residuals. Accordingly, there may be people who need to eat meat for serious health reasons which may give strong reasons to engage in AFAH (Smolkin, 2021: 254). But it is quite different from claiming that there are strong reasons that urge to eat meat from AFAH and respect the moral residuals – the harm experienced by the slaughtered animals – than to advocate the logic of the larder which claims that the animals should be happy to be killed and eaten as they would not have existed otherwise.

I am here not interested in the subjective experience of guilt, though, which is often denoted as 'remorse'. R. M. Hare, for example, frames 'remorse' as a subjective feeling of guilt that arises from the failure of acting according to one's beliefs: 'If a person does not do something, but the omission is accompanied by feelings of guilt, etc., we normally say that he has not done what he thinks he ought' (Hare, 1967: 169). According to this view, one could have remorse about eating meat from animals who were reared in industrial farming if she thinks that eating such meat is wrong and ought to refrain from doing so. Or the farmer could feel remorse, as the slaughter of a well-known farm animal with whom she has established a close relationship can be conceived as 'a gross betrayal of trust' (Serpell, 1996: 187).

These are certainly important instances of remorse. But I am much more interested in the detachment that results from the conceptualization of AFAH that cumulates in the purification strategy as presented further above. Let me illustrate that discussing Hare. He justifies being a demi-vegetarian and why we should not refrain from eating meat reminiscent to Stephen:

The reason is that if we gave up eating animals the market for meat would vanish, and no more animals would be raised for meat-production. ... This thought gives me pause when I walk in the fields around my home in England, and see a great many apparently happy animals, all destined to be eventually eaten. As it happens, they are mainly pigs, who would certainly not be kept except for the bacon market. (Hare, 1999: 240)

Combining Hare's statements on remorse and on AFAH, I conclude that Hare would say that he has 'done what he thinks he ought' when consuming 'happy meat'. But I think that this is a form of detachment that Hare not only advocates but engages in. This form of detachment results in a purification strategy. Here, ethical argumentation serves as a means to avoid guilt (Grimm and Schleissing, 2019). It aims at extinguishing guilt by conceiving AFAH as a 'win-win situation'. But: the animals' harm, even if their lives were the happiest imaginable, is real as the animals' lives are early and violently ended. This is simply what slaughter is.

But what if, in the future, a technique could be invented that would allow animals to be killed painlessly while they sleep in AFAH? Would this produce moral residuals and hence guilt, too? I would affirm the latter question as the animals are prevented from experiencing their pleasant futures (living a pleasant life and future is a core assumption of AFAH). And as Singer and Višak argue for: cows, pigs and chicken have interest in continuing their lives. So, it seems reasonable to assume that even painless killing produces harm – the prevention of experiencing a pleasant future – and thus moral residuals.

What I propose, then, is this: I am less interested in the subjective feeling of guilt, i.e. remorse, that someone might experience when eating 'happy animals' or by being aware of the faultiness of the logic of the larder. I rather frame guilt as the detachment that derives from the strategy of rendering the animals' experienced harm in AFAH invisible. In this sense, guilt does not only appear in individuals (consumers or farmers) but also in the system that advocates the logic of the larder. Guilt tethers the experienced harm to the actions that produced that harm, thereby pressing to the fact that the animals' experienced harm, i.e. moral residuals, remains. Someone can be guilty, and this can be the case even if she lacks the feelings of guilt. Likewise, a food production system can produce, in the sense of collective action, guilt.

The upshot of the critique of AFAH with my conception of guilt is that it shows that we are, on the one hand, responsible for the outcomes of our actions. But we are also, on the other hand, responsible for how we conceptualize AFAH. If we aim to follow the logic of the larder, we are engaging in a purification strategy that conceals the experienced harm of the animals. Singer accepts that strategy but wishes to reduce it to merely conscious beings. Višak is somewhat closer to my account as she rejects the idea of replaceability, but her account does not scrutinize the role of responsibility and does not criticize the purification strategy to eradicate guilt in AFAH. Still, Singer's and Višak's criticisms of AFAH cannot account for what Serpell further above calls a 'betrayal of trust' as they are exploring the issue from an abstract, detached perspective. The conception of guilt as presented here, in contrast, takes responses as described by Serpell seriously as it is addressing the responsibility of farmers, consumers and systems alike.

Conclusions

The justification of AFAH as presented here is flawed as it aims at purifying the harm that the animals experience due to slaughter. My conception of guilt contrasts with that. But it also does not necessarily run into political veganism. There might be strong reasons for the consumption of the meat of 'happy animals'. But these strong reasons do not purify the harms experienced by the animals. What I tried to argue for in this paper, in this sense, is not the abolition of AFAH but a shift in approaching the phenomenon. AFAH is an economic endeavour which exists to satisfy human ends. The reason that 'happy farm animals' exist is fundamentally tethered to this fact. If we (as individuals but also as society or as a food system in the sense of a collective agent) are prepared to kill and subsequently eat animals, we are faced with their harm, we are guilty of having caused it. So, instead of praising the alleged privilege of living a happy life that is merely possible because the animals are killed for their meat and derivatives, we should face the responsibility we have when killing 'happy animals' for 'happy meat'. If strong reasons are pressing to engage in AFAH, like serious health reasons, the harm that results for the animals *may* be justified. But it is not merely justified by the aesthetic pleasure that derives from eating meat and

Section 4

eggs and milk. Simply bearing the guilt because one wants to stick to eating habits or pleasure will not do it. But then we are still faced with this problem: How can we compensate for the loss of the animal's pleasant future? Just bringing a new farm animal into existence will not do it.

Acknowledgements

I wish to thank Erich Linder and the reviewer in charge for their helpful comments. I also thank Herwig Grimm for enriching discussions on guilt and ethics that inspired this article.

References

- Bobier, C.A. (2021). What would the virtuous person eat? The case for virtuous omnivorism. *Journal of Agricultural and Environmental Ethics*, 34(3): 19. <https://doi.org/10.1007/s10806-021-09860-5>
- Grimm, H and Schleissing, S. (2019). Moral ohne Schuld? Ethik als Mittel der Schuldvermeidung: Zur Einführung. In: Grimm, H and Schleissing S. (eds.) *Moral und Schuld: Exkulpationsnarrative in Ethikdebatten*. Nomos, Baden-Baden, Germany, pp. 7-9.
- Gruen, L. and Jones, R.C. (2016). Veganism as an aspiration. In: Bramble, B. and Fischer, B. (eds.) *The moral complexities of eating meat*. Oxford University Press, New York, USA, pp. 153-171.
- Hare, R.M. (1967). *The language of morals*. Oxford University Press, London, United Kingdom, 202 pp.
- Hare, R.M. (1999). Why I am only a demi-vegetarian. In: Jamieson, D. (ed.) *Singer and his critics*. Blackwell, Oxford, United Kingdom, pp. 233-246.
- Hsiao, T. (2017). Industrial farming is not cruel to animals. *Journal of Agricultural and Environmental Ethics*, 30(1): 37-54. <https://doi.org/10.1007/s10806-017-9652-0>
- Milburn, J. and Bobier, C. (2022). New omnivorism: a novel approach to food and animal ethics. *Food Ethics*, 7(1): 5. <https://doi.org/10.1007/s41055-022-00098-z>
- Pluhar, E. (2010). Meat and morality: alternatives to factory farming. *Journal of Agricultural and Environmental Ethics*, 23(5): 455-468. <https://doi.org/10.1007/s10806-009-9226-x>
- Rossi, J. and Garner, S.A. (2014). Industrial farm animal production: a comprehensive moral critique. *Journal of Agricultural and Environmental Ethics*, 27(3): 479-522. <https://doi.org/10.1007/s10806-014-9497-8>
- Salt, H.S. (1976). Logic of the larder. In: Regan, T. and Singer, P. (eds.) *Animal rights and human obligations*. Prentice-Hall, Englewood Cliffs, USA, pp. 185-189.
- Scruton, R. (2004). The conscientious carnivore. In: Sapontzis, S. (ed.) *Food for thought: the debate over eating meat*. Prometheus Books, Amherst, USA, pp. 81-91.
- Serpell, J. (1996). *In the company of animals: a study of human-animal relationships*. Cambridge University Press, New York, USA, 283 pp.
- Singer, P. (2011). *Practical ethics* (3rd ed.). Cambridge University Press, Cambridge, USA, 337 pp.
- Smolkin, D. (2021). Is humane farming morally permissible? *Journal of Applied Philosophy*, 38(2): 244-257. <https://doi.org/10.1111/japp.12503>
- Višak, T. (2013). *Killing happy animals: explorations in utilitarian ethics*. Palgrave Macmillan, London, United Kingdom, 188 pp.
- Zangwill, N. (2021). Our moral duty to eat meat. *Journal of the American Philosophical Association*, 7(3): 295-311. <https://doi.org/10.1017/apa.2020.21>
- Western Farm Press (2013). Killing cattle softly: slaughterhouse or gun? Available at: <https://www.farmprogress.com/blog/killing-cattle-softly-slaughterhouse-or-gun>. Accessed 24 February 2022.

33. Capturing the animal in ethics – linguistic perspectives on understanding the animal concept

K. Dieck

Messerli Research Institute, Vienna, Unit of Ethics and Human-Animal-Studies, Veterinärplatz 1, 1210 Vienna, Austria; katharina.dieck@vetmeduni.ac.at

Abstract

The way we treat animals regularly contradicts any theories on how we should treat them. This obvious mismatch of theory and practice has constituted a long-standing debate in animal ethics. Responding to this, two strands of approaches have crystallised within the debate: One line of approaches prioritizes theory, insofar as they claim practice to be shaped by human flaws and inconsistencies, such as weakness of the will or cognitive dissonance. The other one claims that theories usually fail to match up to our lived morality. This separation of the debate poses an argumentative one-way street with no agreement in sight. This article aims to offer a productive reinterpretation, taking language as a core missing link between theory and practice. For both in theory and in practice, what animals are is reflected in language use: Ethical theories necessarily fall back on language to term the object of moral deliberation. In practice, we engage in very different routines to capture a rat linguistically, depending on whether it is a pet in living room or vermin in the sewers. The pet rat has been given a name, her personal traits are a regular topic at family dinner, e.g. Is she nervous or sleepy today? Whereas a rat as vermin is rarely conceptualized as an individual with personal traits, as the term ‘vermin’ already indicates, for it exists in plural only. Both in theory and in practice, the way we conceptualize animals via language promotes particular understandings. By turning to a current approach to language-understanding in Cognitive linguistics, the focus of this article is on the cognitive-linguistic conditions to perceive animals. A frame-semantic theory by Alexander Ziem (2014) is used to address the following questions: *How does language use define an understanding of what animals are?* Taking a linguistically informed perspective, this article suggests that any ‘theory-practice gap’ in the debate of animal ethics is not necessarily a problem but an unfortunate description. For processes regarding language understanding highlight that there can be no understanding without relation to practice and thus no strict distinction between a theoretical and a practical level in the debate as soon as we engage in language use. Thus, this opens up new lines of research on how frame-semantics may provide further ways of addressing problems in ethics.

Keywords: framing, frame-semantics, linguistics, animal ethics

Introduction: the mismatch of theory and practice

What do we deal with in animal ethics? We deal with dogs and cats, obviously, with cows, sheep, goats, and pigs. Furthermore, we deal with chimpanzees, blackbirds, rabbits and sometimes rats. We might also deal with bees, earthworms, or jellyfishes. With snakes, frogs, bugs, and crabs. The list could go on forever. So, when we do animal ethics, we are dealing with a lot. This obviously poses a challenge for theories, when referring to animals as the object of deliberation. Because when using the concept of animal, what is referred to often remains elusive. So, how do theories in animal ethics deal with the fact that the term ‘animal’ can mean so many things?

In animal ethics we try to capture ‘the animal’. Linguistic expressions used in theories elicit different ideas of what animals are or could be. Thus, we deal with individuals with the capacity to suffer (Singer, 1976), experiencing subjects-of-a-life (Regan 1983), individuals we can have relations with (Palmer,

Section 4

2010), citizens in a state (Donaldson and Kymlicka, 2013) or fellow creatures in mortality (Diamond, 1978). However, particular aspects of practices recurrently escape the conception of animals on which different theories rely. Taking a step outside of these normative theories, we deal with a multitude of different understandings of what an animal is. For example, a rat is considered a pet in a cage in a children's room while it counts as vermin in the sewers. A rat seen as vermin poses a potential health hazard that is to be eliminated – on that premise there is usually no moral doubt on harming the animal. A rat seen as a children's pet counts as a companion or friend for the child, and therefore something that has to be protected from any health issues and taken to the vet regularly. This has constituted a long-standing and intensely debated problem in animal ethics – practice and theory regularly do not match. Over the last decades, the debate brought forward different ways of dealing with a mismatch between theory and practice. Until today, two strands of theories and different ways of interpreting this mismatch have emerged. The prominent line of argumentation upholds the equal consideration principle in combination with the postulating a morally relevant characteristic that humans and animals share to ground moral status for animals (e.g. Fischer, 2021; Horta/Albersmeier, 2020; McMahan, 2005; Pluhar, 1995; Regan, 1984; Sebo, 2017; Singer, 1976). Any differences in our treatment of animals are therein explained as inconsistencies, which stem from individual moral shortcomings, such as weakness of the will or cognitive dissonance (e.g. Dhont and Hodson, 2019; Herzog, 2011; Joy, 2011; for an overview Grimm and Wild, 2016). The other side, however, claims that the fault does not lie within individual or collective moral shortcomings, but with deficient theories, that fail to capture certain aspects of our lives adequately (e.g. Abbate, 2014; Crary, 2010; Diamond, 1978; Grimm, 2010; Midgley, 1984).

While one strand concludes that our current practices regarding animals are inherently inadequate, the other sees the theories as flawed. The structure of this debate seems to be two one-way streets, for the different strands oppose each other. Even though both lines of theory deal with the same problem, a productive way of complementing each other is not yet in sight. This article aims to introduce a novel way to deal with this mismatch of theory and practice within the debate of animal ethics. By incorporating a linguistically informed approach, it may provide a possible way to link these one-way streets.

Language as the missing link?

This article starts from the assumption of language as the means to conceptualize what we are dealing with both in theory and in practice. No matter how incommensurable the two sides of the debate seem, both fall back on language to describe what we are dealing with. So, within animal ethics, we do not encounter animals but descriptions of them – we do not deal with animals, but with texts. This remarkably simple observation opens up the possibility to shed light on the linguistic level of descriptions of animals in ethics. In any text that is placed within the research field of animal ethics, the object of our moral deliberation is characterized. We have to specify what kind of objects we deal with, i.e. animals.

Within practice, different understandings of animals are reflected in language use, too. We engage in very different routines to capture the two rats linguistically: The pet rat has been given a name, her personal traits are a regular topic at family dinner, e.g. Is she curious or sleepy today? Whereas a rat seen as vermin is rarely conceptualized as an individual with personal traits, as the term 'vermin' already indicates, for it exists in plural only. Therefore, the conception of the rat as an individual is marginalized and becomes less salient. The verb constructions associated with having a pet are, for instance, 'to own a pet' or 'to take care of a pet'. However, even if the identical verb construction can be employed for a rat seen as vermin, the meaning deviates. If someone tells us they 'took care of the rats in the basement', we have good reason to assume he or she was neither feeding nor petting the rats.

Thus, this paper offers a different interpretation of the debate around the theoretical or practical mismatch by taking language as a missing link between theory and practice. By turning to a current account on

language-understanding in Cognitive Linguistics, the focus will be on how different descriptions of animals impact our understanding of an animal. The linguistic perspective thereby promises to address the following question: How does language use define an understanding of what an animal is and how does this impact the debate? The underlying interest for this article is thus a meta-theoretical one, hinting at language use as a potential factor in our normative judgements about animals, that can be incorporated into ethical deliberations. However, I refrain from posing any normative considerations on how we should think or talk about animals, as this goes beyond the limited scope of this paper.

Introducing a theory of language understanding: Frame-Semantics

The forlornness of the veal calf is pathetic, heart wrenching; the pulsing pain of the chimp with electrodes planted deep in her brain is repulsive; the slow, torturous death of the racoon caught in the leg-hold trap is agonizing. (Regan, 1983:15)

We can see the words on the paper and picture an animal: How do we come to understand an animal in this quote? A Frame-semantic theory promises to shed light on this by focusing on the interconnection between language and thought. Frame-Semantics is thereby situated within the framework of Cognitive Linguistics, which poses a contrary paradigm to traditional linguistic theories in the 20th century, such as Generative Grammar (for an overview, see Geeraerts, 2006). What do we understand about the animals in reading Regan's quote, that is not directly in the quote?

Taking the second sentence of the quote – *the pulsing pain of the chimp with electrodes planted deep in her brain is repulsive* – Intuitively, we picture the chimp to be in a lab and not in a jungle or a zoo. We take it, that the chimp is used in an experimental setting, in which researchers have implanted the electrodes into her brain. We also gather from reading the sentence without any effort, that the chimp is suffering in his condition and thus can make sense of the description of the situation as repulsive. Furthermore, we might have made further educated guesses on the situation (that the chimp is inside rather than outside), ranging from the colour of the walls (rather white than pink) to the kind of light in the room (neon tubes rather than candles). How is this rich understanding possible from reading this short sentence? Frame-semantics give an answer.

What are Frames?

The frame-semantic theory by Alexander Ziem (2014) holds that this rich understanding of the short sentence is possible via the activation of knowledge structures, which 'frame' a particular understanding. *Frames* are thus semantic representational formats that refer to cognitive structures containing all the contextual background knowledge, which we use to make sense of an expression. Thus, we do not understand a sentence by combining its elements like a mathematical formula, but by means of structures that are activated via linguistic input. Without the activation of these structures, we would not be able to understand a sentence the way we do. The postulation of frames as cognitive structures goes beyond asserting that background knowledge is important, for it offers a systematic theory and analysis on how understanding is possible by focusing on its structural characteristics.

But how are frames structured then? Frames contain three structural elements: Slots, Fillers and Default Values. *Slots* can be identified in the form of meaningful questions to ask, e.g. how is the experiment set up? How many researchers are present? Is the experiment legal? Having read the first sentence, we would not come to ask how 'green' the pulsing pain of the chimp is, because 'green' is not the right category to fill a slot within the pain-frame. Competent speakers are able to distinguish intuitively which questions make sense to ask and which do not. Slots come to be filled by two kinds of values, i.e. fillers and default-values. *Fillers* are values put into slot as motivated by linguistic input, e.g. that the chimp has electrodes

Section 4

in her brain. *Default-values* are what is mentally added to understand the sentence, e.g. that the chimp is part of an animal research set-up. In other words, they are expected, presupposed by all participants in the conversation and therefore do not need to be explicated. Since default values are so firmly anchored in collective thinking and speaking, they can also be understood as ‘cognitively entrenched predications’ or ‘cognitive trails’ (Ziem, 2014: 383), for they constitute the standard ways to understand something. On a different abstraction level, each default value and each filler create a frame as well. Frames are thus never a solitary unit but exist in entanglement with other frames within a *frame-network*. Frames are therein interconnected and embedded in each other in many ways as superordinate and subordinate. In this language-understanding frame-theory, what we refer to as ‘frame’ thus just highlights one section of the cognitive structures that enables understanding.

Crucial to frame-theory is that our understanding is not constituted by linguistic input alone and is thus not objectively the same to anyone. Since our understanding is largely dependent on absent frames, in the form of activated default-values, different understandings of one and the same sentence can arise. What comes to be a default-value in a certain slot of a certain frame is shaped within *discourse*: How we collectively speak about the world, determines which elements of meaning go without saying and which elements of meaning are brought to the surface by explicating them in language use. Thus, how we come to understand something is mediated via discourse, via collective language use. If, for example, one is not familiar to the concept of animal experiments, one cannot understand that the chimp is in a lab from the exemplary sentence. Not being used to the idea that animals serve as models within experimental settings to gain knowledge for human purposes, one would have trouble to understand the sentence at all.

Meaning in frame-semantics

For frame-semantics, there can be no understanding without context: The background knowledge, that is structured in frames, is constituted by an iteration of experienced contexts and their linguistic conceptualization in discourse. Thus, ‘neutral context’ interpretations are simply those which are so accessible from our entrenched conceptual structures that their construction requires very little help from a specific context in the outside world’ (Sweetser, 1999: 137). There cannot be language use without practice, for language becomes understandable only through the experience of practice. Hence, the idea of any ‘neutral’ language for a theory is no longer applicable. If there was a theory formulated in neutral language, it would not be understandable for us. From a frame-semantic perspective, language arises out of our interaction with the world, thus there can be no (natural) language without reference to the world. Even if there might be a world apart from language, it would not be interesting for us since it eludes any viable way of addressing it.

What can frame-semantics add to animal ethics?

The expressions we use to talk about animals evoke frames which enable our understanding of them. Depending on the words we employ to describe animals, our understanding of what the animal is differs, for every word evokes a frame (Lakoff, 2014: 1) but it is not always the same frame that is evoked. This supports the intuitive claim, that how we talk about something impacts how we understand it. Frame-semantics can provide both the theoretical and methodological basis to investigate this claim (for an overview of methodological aspects of frame-semantic analysis, see Ziem, 2014: 315-378). Coming back to Regan’s sentence, *‘the pulsing pain of the chimp with electrodes planted deep in her brain is repulsive’* – How does this description make the reader picture the animal in question? This depiction of the chimp’s situation presupposes an already established understanding of a chimp as a sentient being, for which it matters how we treat it. For we assume that the chimp experiences the ‘pulsing pain’ negatively, from activating the frame ‘pain’. Furthermore, the attribution to the situation as ‘repulsive’ only makes sense if we suppose that the chimp does not like to have ‘electrodes planted deep in her brain’. These remarkably

simple observations demonstrate nevertheless how many presuppositions about the world are active in the background, to understand this short sentence. For instance, if someone was not to be convinced that a chimp experiences pain as we do the attribution of ‘repulsive’ would fail to convince.

In contrast to this, how a chimp is described within the field of animal research might differ drastically: ‘Chimpanzees have not been a universally satisfactory model for human diseases.’ (U.S. National research Council, 1997: 1). Here, the animal is depicted as a research model that underlies certain criteria to qualify as a satisfactory model, i.e. sufficient similarity to humans. What is highlighted in this depiction, is that within an established practice, it works to use animals as research models for humans, even though there might be exceptions. What is marginalized here, however, is the aspects that Regan points to: The chimp as a sentient being, whose suffering is accepted to gain research insights for medical treatment of humans.

Within frame-semantics, these different descriptions are not merely different ways of putting something, but reflections of cognitive concepts with which animals are perceived regularly. Thus, within the discourse of animal researchers on a project operating with chimps, this instrumentalizing way of thinking about the animals does not just remain a ‘cognitive trail’ but becomes rather quickly a ‘cognitive highway’. *Vice versa*, it becomes hard to think about the chimp any other way than as a potentially suffering being for animal rights’ advocates.

Conclusions

If we take current theories of language understanding seriously, it matters both how animals are talked about as well as how we talk about animals in ethics. Because the more the activated default-values of the text-producer differ from potential text-recipients, the less likely is the intended understanding of the text (Ziem, 2006: 332). Furthermore, frame-semantics may enrich the notion of us as understanding subjects: since language arises from our interaction with the world, understanding linguistic expressions can never be separated from speaking and practice.

For it is not the sentences that ‘carry’ meaning, but ‘people carry meaning.’
(Bransford *et al.*, 1972: 207, in Ziem, 2014: 102)

Regarding frame-semantics, as soon as we use language, there cannot be a strict dichotomy between theory and practice within animal ethics. Because any theory falls back on contextualized practice in its language use. Thus, there can be no such thing as a ‘theory-practice-gap’. A linguistically informed approach can add to the debate by suggesting a different way to make sense of this: If there is no strict line between theory and practice, we might not have two one-way streets, but complementary approaches to address a moral problem. The first strand of approaches, that puts theory before practice, can be interpreted as an attempt to reconceptualize aspects of our practice with animals by proposing a central concept of what an animal should be conceptualized: A sentient being for whom it matters how we treat it. The second one, that puts practice before theory, however, can be seen as an attempt to classify the debate and organize our concepts about morality, in order to inform basic conditions of moral theory. This interpretation omits the one-way character of the debate and allows for potential mutual information and completion of the different strands. It demonstrates the appeal of applying frame-semantic theory to ethics, as it offers new ways of addressing ethical issues by focusing on the conditions of language use and understanding. Of course, this also comes with further research questions, such as: What is the role of a normative-ethical theory then? How is it possible to change a situation or the way people think and speak about it? Which role does language use has in changing a situation? So, even though making this suggestion viable demands further research, what can nevertheless be concluded from this brief sketch is that frame-semantics promises a lot of potential for its application in ethics.

Acknowledgements

A special thanks goes to Herwig Grimm for his thorough overview and helpful comments on the first draft.

References

- Abbate, C. (2014). Virtues and Animals: A Minimally Decent Ethic for Practical Living in a Non-ideal World. *Journal for Agriculture and Environmental Ethics* 27: 909-929.
- Bransford, J. D., Barclay, J. R., Franks, J. J. (1972). Sentence memory: A constructive versus interpretative approach. *Cognitive Psychology* 3: 193-209.
- Crary, A. (2010). Minding What Already Matters: A Critique of Moral Individualism. *Philosophical Topics*, 38(1): 17-49.
- Dhont, K./ Hodson, G. (Eds.), (2019). *Why We Love and Exploit Animals. Bridging Insights from Academia and Advocacy*. Routledge, London, UK.
- Diamond, C. (1978). Eating meat and eating people. *Philosophy*, 53(206): 465-479.
- Donaldson, S., Kymlicka, W. (2013). *Zoopolis: A Political Theory of Animal Rights*. Oxford University Press, Oxford, UK.
- Fischer, B. (2021). *Animal Ethics. A Contemporary Introduction*. Routledge, New York, US.
- Geeraerts, D. (2006). A rough guide to Cognitive Linguistics. Dirk Geeraerts (Hg.), *Cognitive Linguistics: Basic Readings*, 1-28. De Gruyter, Berlin, Germany.
- Grimm, H. (2010). Das moralphilosophische Experiment. John Deweys Methode empirischer Untersuchungen als Modell der problem- und anwendungsorientierten Tierethik. Mohr Siebeck, Tübingen, Germany.
- Grimm, H., Wild, M. (2016). *Tierethik zur Einführung*. Junius, Hamburg, Germany.
- Herzog, H. (2011). *Some We Love, Some We Hate, Some We Eat. Why it's so Hard to Think Straight about Animals*. Harper Collins, New York, US.
- Horta, O., Albersmeier, F. (2020). Defining Speciesism. *Philosophy Compass*, 15(11): 1-9.
- Joy, M. (2011). *Why We Love Dogs, Eat Pigs and Wear Cows: An Introduction to Carnism*. Conari Press, San Francisco, US.
- Lakoff, G. (2014). *The All New Don't Think of an Elephant: Know Your Values and Frame the Debate*. Chelsea Green, White River Junction, US.
- McMahan, J. (2005). Our Fellow Creatures. *The Journal of Ethics*, 9(3/4): 353-380.
- Midgley, M. (1998[1984]). *Animals and Why They Matter*. University of Georgia Press, Athens, US.
- Palmer, C. (2010). *Animal ethics in context*. Columbia University Press, New York, US.
- Pluhar, E. B. (1995). *Beyond prejudice: The moral significance of human and nonhuman animals*. Duke University Press, Durham, UK.
- Regan, T. (1983). *The Case for Animal Rights*. The University of California Press, Berkeley, US.
- Sebo, J. (2015). Agency and Moral Status. *Journal of Moral Philosophy*, 14(1): 1-22.
- Singer, P. (1976). All Animals Are Equal. In Regan, T., Singer, P. (Eds.), *Animal Rights and Human Obligations* (pp. 148-162). Prentice-Hall, New Jersey, US.
- Sweetser, E. (1999). Compositionality and blending: Semantic composition in a cognitively realistic framework. In Janssen, T., Redeker, G. (Eds.) *Cognitive linguistics: Foundations, scope, and methodology*, (pp. 129-162). De Gruyter, Berlin, Germany.
- U.S. National research Council (1997). *Chimpanzees in Research: Strategies for Their Ethical Care, Management, and Use*. Available at: <https://www.nap.edu/catalog/5843/chimpanzees-in-research-strategies-for-their-ethical-care-management-and>
- Ziem, A. (2006). Begriffe, Topoi, Wissensrahmen. Perspektiven einer semantischen Analyse gesellschaftlichen Wissens. In Wengeler, M. (Ed.), *Sprachgeschichte als Zeitgeschichte. Konzepte, Methoden und Forschungsergebnisse der Düsseldorfer Sprachgeschichtsschreibung für die Zeit nach 1945* (pp. 315-348). Olms, Hildesheim, Germany.
- Ziem, A. (2014). *Frames of Understanding in Text and Discourse. Theoretical foundations and descriptive applications*. John Benjamins, Amsterdam, The Netherlands.

34. Limited aggregation and zoonotic disease outbreaks

M. Eggel^{1,2*} and A. Martin¹

¹Philosophisches Seminar, Steinengraben 5, 4051, Switzerland, ²Environmental Sciences and Humanities Institute (UniFR_ESH Institute), Chemin du musée 4, 1700 Fribourg, Switzerland; matthias.eggel@unibas.ch

Abstract

Human and animal interests are often in conflict. In many situations, however, it is unclear how to evaluate and weigh competing human and animal interests, as the satisfaction of the interests of one group often inevitably occurs at the expense of those of the other group. Human-animal conflicts of this kind give rise to ethical questions. If animals count morally for their own sake, then we must ask in which cases the satisfaction or frustration of the interests of humans and animals in conflict situations is justified or unjustified from an ethical perspective. In this article, we argue that limited aggregation accounts represent a promising means for resolving interspecies conflicts. The reason for this is that they can appropriately consider the *qualitative relevance* of interests, their *relative importance* to each other, and the *number* of individuals affected. For our argument, we start from the premise that animals count morally for their own sake, albeit to a lesser extent than humans. That is, we accept the view that animals may be used, for example, as a source of food or in animal research. However, as we will show, many basic interests of animals are *sufficiently similar* to human interests and can thus be compared to them. Hence, they ought to be aggregated in cases of conflict with human interests. We illustrate our account and its practical implications with the real-world example of a human-animal conflict during the outbreak of a zoonotic diseases among farmed animals. We conclude that, in many cases, animal interests ought to be given more importance than they currently receive, which includes distributing the burdens and risks of farming practices more fairly.

Keywords: animal ethics, human-animal conflicts, weighing of interests

Introduction

The interests of humans and animals are often in conflict, for example, in the case of zoonotic disease outbreaks amongst farmed animals. In the case of highly infectious diseases, the well-being and life of farmed animals, humans, and other animals (such as wild ones) are at stake. In such cases, culling is often considered the main means for controlling the outbreak of the disease. Hence, satisfying the interests of humans often inevitably comes at the expense of those of animals. However, this gives rise to ethical concerns. If animals count morally for their own sake, then we must ask in which cases the satisfaction or frustration of the interests of humans and animals in conflict situations are justified or unjustified from an ethical perspective. In this article, we argue that limited aggregation accounts represent a promising means for resolving such interspecies conflicts.

Limited aggregation for resolving interspecies conflicts

Conflicts between the interests of humans and animals arise in many situations. Not only do humans use animals for research and food, but animals and humans share habitats and interact in various ways with each other. For example, wild animals may pose a threat to human health or may be a nuisance for human property. At the same time, humans destroy the habitats of wild animals through their extensive use of natural resources. This can lead to the damaging or even destruction of one party's possessions, livelihood, and even health, resulting in suffering and sometimes even death. In these situations, the

Section 4

interests of *both* humans *and* animals often cannot be satisfied at the same time. That is, the satisfaction of the interests of one group necessarily involves the frustration of the interests of the other group. General principles and applicable theories are urgently needed to guide decision-making when it comes to such cases of interspecies conflicts.

What renders decision-making difficult in this context? First, in many cases, interests of *different strength* are at stake: There may be a conflict between trivial human interests and the fundamental interests of animals, and vice versa. Second, the interests of animals and humans may have *similar strength*, which makes it difficult to decide whose interests should be prioritized and why. In such cases, the human interests often receive lexical priority over the interests of animals. The reason for this is that many people assume that humans matter morally more than animals. Finally, the *number of individuals affected* may vary substantially. For example, an animal experiment may require hundreds or even thousands of research animals, while at the same time it is unclear how many human beings might eventually benefit from the outcome of this research. Potentially, this number will be much smaller than the number of animals used. This raises the question of how many animals can legitimately be sacrificed in order to improve the health of an indeterminate number of humans. Therefore, a theory that can resolve conflicts between the interests of humans and animals ought to be responsive to interests of varying strength and the number of individuals affected.

These factors have been thoroughly considered in the philosophical literature on aggregation, which often revolves around paradigmatic thought experiments such as the following (Tomlin, 2017):

Case 1: You can save one person from death or some larger number of people, N1, from paralysis.

Case 2: You can save one person from death or some larger number of people, N2, from a mild headache.

According to accounts of aggregation, the importance of the interests of all individuals affected has to be calculated in order to decide whose interests should receive priority. Proponents of *unlimited aggregation* (Norcross, 1997, 2009) argue that one ought to save the large group of individuals from paralysis (Case 1) and headaches (Case 2). According to this view, lives, paralysis, and headaches can all be weighed and aggregated against each other. Other philosophers claim that, in both Case 1 and Case 2, one ought to save the person who is going to die. They argue death should *never* be aggregated against 'lesser' harms, such as headaches, paraplegia, and broken limbs (i.e. the non-aggregation of death, defended for example by Kamm, 2007). Finally, some philosophers have argued in favour of *limited aggregation*. On such accounts, one ought to save the one person from death in Case 2, because one ought not sacrifice the life of one person to spare thousands or even millions of individuals from a mild headache. In Case 1, however, one ought to save the larger number of individuals from paralysis, because death and severe harms can be aggregated, but only against other basic or non-trivial interests (Lefkowitz, 2008; Voorhoeve, 2014, 2015). In practice, this means that only interests of *similar relevance* ought to be aggregated. In cases of interests that are qualitatively significantly different, aggregation is precluded. After all, a minor nuisance, such as a sore throat or a light headache, has a relatively insignificant effect on our life and well-being, as compared to more serious harms, which have much more significant negative effects on our well-being, functioning, and capabilities (Voorhoeve, 2015). This means that the qualitative negative effect of a sore throat or a light headache ought not to be compared with and aggregated against the detrimental effects of more severe harms, such as broken limbs, paraplegia, or death. By contrast, the latter are sufficiently similar in importance that they should be aggregated against each other.⁷

⁷ We acknowledge that limited aggregation accounts are not uncontested. However, we do not have the space to elaborate on that discussion here. For a more detailed account of the topic, refer to Norcross (1997), Parfit (2003), Broome (2004), and Tomlin (2017).

This means that limited aggregation accounts can account for the three following important factors:

1. The *qualitative importance of individual interests* – this factor is responsive to varying strengths of individual interests from a moral perspective.
2. The *comparative importance of interest* – this factor is responsive to the relative importance of interests compared to other interests.
3. The *number of individuals affected* – this factor is responsive to the quantitative importance of interests.

So far, limited aggregation accounts have exclusively been applied to interhuman conflicts. However, limited aggregation accounts are also promising when it comes to resolving interspecies conflicts. For our argument, we start from the assumption that the interests and well-being of sentient animals matter morally for their own sake. This is a rather uncontroversial view, not only among academics, but also among citizens of Western societies in general. However, there is a controversy with regards to *how much* animals' interests count. Two views can be distinguished: (1) the view that animal interests matter as much as similar human interests; and (2) the view that human interests matter more than similar animal interests. The former position presupposes that animals have an equal moral status to humans, while the latter one endorses a hierarchical understanding of moral status. For the sake of our argument, we accept here the view that animals count morally for their own sake, albeit less than humans (i.e. a *hierarchical understanding of moral status*). The reason for this assumption is rather pragmatic, namely because a hierarchical view of moral status underlies most current human-animal relations (e.g. farming practices and animal research) in many societies. It is often assumed that humans are allowed to make use of animals, but that their suffering must be reduced to a minimum.⁸

One important aspect often neglected by hierarchical understandings of moral status is the 'painless' death of animals. The focus of the animal-use industry often lies on the minimization of harm and does not consider animal death from a moral perspective. However, even if one assumes that animals and their interests count less than human interests, morally speaking, their death should still be given some weight. We commonly consider the killing of humans morally problematic, even if it is done painlessly and even if those killed are not psychologically tied to their future, such as in the case of new-borns. Similarly, we claim, the painless death of animals also requires a moral justification (even if they are not strongly psychologically connected to their future, but even more so, the more developed these connections are). That is, we presuppose here that the deaths of animals matter morally, because death is the ultimate harm: It deprives animals of the possibility of future positive experiences and interest-satisfactions.

In the following, we outline the implications of limited aggregation accounts on the management of zoonotic disease outbreaks amongst farmed animals. We claim that even if one assumes that the interests of animals have less significance than the similar interests of humans, we ought to rethink the ways in which the burdens, benefits, and risks are distributed among farmed animals and humans. Of course, if one assumes an egalitarian view of moral status, the practical implications of the account presented here will be even more significant.

⁸ For our argument, we assume acceptable living conditions for farmed animals, such as free-range farming of chicken, cattle, and pigs. Industrial factory farming which involves considerable animal suffering is excluded from our account here. The reason for this is that such practices are incompatible with a hierarchical understanding of moral status that respects animals for their own sake. Furthermore, as industrial factory farming likely involves more suffering than pleasure, the animals involved would probably be better off dead than alive.

Responsibility towards farmed animals during outbreaks of zoonotic diseases

Zoonotic disease outbreaks, such as Ebola, SARS, and COVID-19 represent major threats to public health (Santana, 2020). In cases of zoonotic disease in farmed animals (e.g. among animals destined for the food or fur industry), an immediate response is often the mass culling of thousands (and sometimes even millions) of infectious but still healthy animals, in order to protect the health and lives of both animals and humans (Degeling *et al.*, 2016; Parry, 2004). Most will agree that these are important interests that ought to be safeguarded. At the same time, however, culling practices raise ethical issues.

In our opinion, the well-being and lives of the animals affected (i.e. infected animals) are of sufficient moral significance to be aggregated against the well-being and lives of humans and other animals (i.e. healthy farm animals and potentially even wild animals who may be negatively affected by the disease). This holds true even if one defends a hierarchical view of moral status that assumes that human interests are generally considered more important than qualitatively similar animal interests. In other words, in hierarchical accounts of moral status, animal interests will lose out to human interests of similar strength in a one-to-one comparison. Importantly, however, on aggregationist accounts, the interests of a *large number of animals* will trump those of a small number of humans in cases of conflict concerning similar interests. The more similar animal and human interests are, qualitatively speaking, the fewer the number of animals that need to be affected in order to trump human interests. That is, the suffering of large numbers of animals (e.g. due to pain, bodily impairment, and psychological stress) can trump human pain, suffering, bodily impairment, and potentially even death. Hence, culling practices can only be justified once the qualitative, comparative, and quantitative significance of interests of infected animals have been properly considered and aggregated against human interests (and the interests of healthy animals who are potentially affected). To illustrate this, let us consider the following thought experiment:

Case 3: Imagine a zoonotic disease that causes severe symptoms in animals (e.g. a serious infection that causes high fever and potentially leads to death) and in humans (e.g. a serious infection that causes the immune system to overreact, which also potentially leads to death). Is it ethically permissible to kill animals to prevent the transmission of this disease among the animals and eventually to humans?

The permissibility of culling in this case depends on the number of both animals and humans affected and the potential negative impact on their well-being. That is, human interests prevail in scenarios where both: (1) the well-being and lives human and animal are in danger; and (2) the number of humans affected is larger than, similar to, or even slightly smaller than the number of animals affected. However, in cases where both human and animal lives are in danger, but the number of affected animals is significantly larger than the number of affected humans, animal interests ought to prevail. Consequently, the culling of animals in such cases would not be ethically justified, even if this resulted in significant negative effects on human well-being and potentially even the death of some individuals.⁹

The threshold number for the prevalence of human or animal interests strongly depends on the severity of the disease for animals and humans. In cases of animal diseases that are highly infectious for humans, but only have a minor impact on human health (e.g. a mild fever, headache, or being bedridden for a few days), the interests of animals will already prevail at much smaller numbers than in Case 3 above. Similarly, a zoonosis which primarily represents an economic threat to humans has comparatively little weight against the well-being and life of animals.

Importantly, humans not only have a duty of care and assistance towards the infected animals, but also towards healthy farm animals (and even towards wild animals who may be affected). However,

⁹ We remain agnostic here as to what the exact numbers would have to be for such scenarios.

culling infected farm animals to protect other healthy animals should not be considered the standard operation procedure. Rather, provided that they are likely to be effective, medical treatment, isolation and monitoring options should take precedence over premature culling. Thus, our account has significant implications for how farms ought to be built and run. This includes reducing the number of animals per farm (in order to be able to properly care for sick animals), having enough space for each individual animal (which, in turn, also reduces the risk of disease occurrence and transmission), and having space available for the isolation of infected animals.

Finally, the evaluation of the danger of zoonotic diseases requires a risk assessment. That is, in cases in which the outcome of a disease is not determinate, the numbers of infected individuals (animals and humans), as well as the development and severity of the disease, have to be estimated. Risk is usually classified in terms of the probability of an event occurring and its magnitude. In current animal-farming practices, the burden and risks of the human-animal relation are often distributed in a one-sided way: The benefits lie almost exclusively on the human side, whereas the burden and the risks associated with this relation lie almost entirely on the side of the animals. This is illustrated by the fact that often not only infected, but also healthy animals are culled to minimize the risk for human health.¹⁰ However, according to an account of limited aggregation, where the qualitative, comparative, and quantitative moral significance of animal interests are properly taken into consideration, animals' fundamental interests should often receive more consideration in the case of outbreaks of zoonotic diseases. That is, proper consideration requires a fairer distribution of the burden and risks associated with human-animal practices.

This is even more the case given that humans brought farmed animals into existence and thus are responsible for their dependency on human care, food, and shelter. In such cases, humans acquire special duties of care and assistance. These duties do not fall away in times of zoonotic outbreak and other crises. Hence, humans must be willing to take on a much greater share of the burden and risks associated with farming practices than is often the case at present.

Conclusions

An account that aims to solve interspecies conflicts must be able to take into consideration the quality of interests (*qualitative* moral significance of interests), their relative importance compared to other interests (*comparative* moral significance of interests), and the number of individuals affected (*quantitative* moral significance of interests). We argued that limited aggregation accounts are well placed to take these factors into account and are thus promising for resolving interspecies conflicts. We started from the widely held belief that animals matter morally, albeit to a lesser extent than humans. We argued that animal interests can nonetheless be sufficiently similar to human interests so that they ought to be aggregated against human interests. In practice, this means that animal interests can, in some cases, trump human interests.

We illustrated the implications of limited aggregation accounts for the culling of animals during outbreaks of zoonotic diseases. On this basis, we claimed that animal interests are often due greater consideration than is currently the case. Consequently, our account calls for a fairer distribution of burdens and risk in human-animal relationships, especially when it comes to situations in which humans have brought farmed animals into existence and thus are responsible for their dependency on human care. This duty of care is substantial and does not *eo ipso* fall away in times of a crisis, such as during the

¹⁰ We acknowledge that culling is also undertaken to protect healthy farmed animals and wildlife. However, the point remains that the burden of the culling measures falls entirely on the side of the farmed animals.

Section 4

outbreak of a zoonotic disease. Rather humans ought to be willing to bear a greater part of the risks associated with human-animal relations than is often the case at present.

References

- Broome, J. (2004): A Comment on Temkin's Tradeoffs. In 'Goodness' and 'Fairness' and Weighing Lives. Oxford: Oxford University Press.
- Degeling, C.; Lederman, Z. and Rock, M. (2016): Culling and the Common Good: Re-evaluating Harms and Benefits under the One Health Paradigm. *Public Health Ethics*. <https://doi.org/10.1093/phe/phw019>.
- Kamm, F.M. *Intricate Ethics*. Oxford: Oxford University Press, 2007.
- Lefkowitz, D. (2008): On the Concept of a Morally Relevant Harm. *Utilitas*. <https://doi.org/10.1017/S0953820808003245>.
- Norcross, A. (1997): Comparing Harms: Headaches and Human Lives. *Philosophy and Public Affairs*.
- Norcross, A. (2009): Two dogmas of Deontology: Aggregation, Rights, and the Separateness of Persons. *Social Philosophy and Policy*.
- Parfit, D. (2003): Justifiability to Each Person. *Ratio*
- Parry, J. (2004): WHO Queries Culling of Civet Cats. *BMJ (Clinical research ed.)*. <https://doi.org/10.1136/bmj.328.7432.128-b>.
- Santana, C. (2020): COVID-19, Other Zoonotic Diseases and Wildlife Conservation. *Hist Philos Life Sci*. <https://doi.org/10.1007/s40656-020-00345-8>
- Tomlin, P. (2017): On Limited Aggregation. *Philosophy & Public Affairs*. <https://doi.org/10.1111/papa.12097>.
- Voorhoeve, A. (2014): How Should We Aggregate Competing Claims? *Ethics*.
- Voorhoeve, A. (2015): Why Sore Throats Don't Aggregate against a Life, but Arms Do. *Journal of Medical Ethics*.

35. Citizen views on animal welfare and animal rights in Flanders

L. Heyndrickx and S. Aerts*

Odisee University College, Hospitaalstraat 23, 9100 Sint-Niklaas, Belgium; stef.aerts@odisee.be

Abstract

In Flanders (Belgium) there is no reference to animal rights, or even sentience, in the constitution, nor in the Animal Welfare Act. Recently, the Belgian (Federal) government introduced a third category in the Civil Code, specifically aimed to grant animals a special status, somewhere between goods and humans. In this paper, we will show there is a great support among the public for such addition, and probably more (as on average 87% indicates that they would support including animal rights in the Constitution). Furthermore, we will analyse the demographic and other factors influencing the opinion of the Flemish public with regard to animal welfare and animal rights. The study is based on a sample of 871 respondents of different ages, educational level, and rural/urban background. Unsurprisingly, support for animal rights is stronger with women (who also gave notably more extreme scores) and younger people, but more than half of the respondents oppose animal experimentation (with a striking gender difference with women being three times less supportive) and the use of animals for entertainment. Also, half of them support stronger measures against commercial dog breeding, consider agricultural animals as important as pets, find animal lives as important as human lives, and believe that animals can suffer in the same way as humans. We will also show that these beliefs are not always compatible with the stated lifestyles of the respondents. Indeed, 63% identified as omnivores, and an additional 23% as flexitarians. This was certainly apparent when omnivores gave high (average) scores to the importance of animal lives and suffering. This supports the notion of a psychological disconnection between animals and meat among the consumers. Although the sequence cannot be derived from this study, the data supports the hypothesis that people become flexitarians first, before moving on to vegetarianism, and finally to veganism, based on age, time spent within the lifestyles, and average scores on different statements.

Keywords: animal ethics, consumers, survey

Introduction

More than 35 years ago, the first general animal welfare legislation was drafted in Belgium (Animal Welfare Act, 1986), for the first time extending protection of animals beyond the mere protection against cruelty. In European law, animals are also described a 'sentient beings,' see for example article 13 in the Treaty on the Functioning of the European Union (Simonin and Gavinelli, 2019), building upon an earlier Protocol dating back to 1997 (Verniers, 2019). This provision has not found its way into the Belgian animal welfare act before the subject was devolved to the three regional entities (Flanders, Wallonia and Brussels). As a consequence, in 2022, in Belgium animals are regarded as 'living beings with sentience, their own interests and dignity, deserving of special protection' [own translation] only in the capital region of Brussels (Animal Welfare Act, 1986). Interestingly, a recent update to the federal Civil Code on goods, explicitly refers to animals as sentient beings (Art. 3.39; Civil Code, 2020). At this point, there is no reference to animal welfare in the Belgian Constitution (Verniers, 2021), although some other states do have such provisions (Verniers, 2020).

In this paper we investigate how the Flemish public (representing about 60% of the Belgian population) perceives animal welfare, and possibly animal rights. Furthermore, we will analyse the demographic and other factors influencing the opinion of the Flemish public with regard to these subjects.

Materials and methods

We have collected data through a structured online survey, including questions on demographic variables, and 17 statements probing different positions on ethical and legal issues with regard to animals (keeping total completion time under 5 minutes), using display logic and skip logic to prevent early drop-out of respondents. The ethical and legal positions were operationalised in measurable indicators, avoiding heavy jargon, in order to prevent misinterpretation of the questions. Respondents were asked to score their support for the statements ranging from 'totally agree' (score 5) to 'totally disagree' (score 1). This survey was programmed into Qualtrics and distributed through social media and e-mail. Responses were analysed using SPSS, and (depending on data type and research question) subjected to Mann Whitney U, Kruskal Wallis, Post-hoc test with Bonferroni correction, Spearman correlation or Fisher's exact test.

871 responses have been collected, with 77,3% female and 22,6% male respondents, ages vary between 14 and 81. There was a considerable overrepresentation of ages from 20 to 30. 70% of the respondents lived in a rural community, which is about the same as the average Flemish population. Educational level was also quite on par with the general public, as 48% did not have any higher education. Importantly, 63% identified as omnivores, and an additional 23% as flexitarians. Only 5% identified as vegetarians, 4% as pescatarian, 3% as vegans, and 2% as 'other'. Again, this is similar to the population in general.

Results

In line with popular belief, support for animal rights is stronger by women (who also gave notably more extreme scores) and younger people. Support for legislation on animal rights was strong among both sexes (87% of respondents agree when asked a yes/no question). When presented with a 5-point Likert scale, a clear majority of the respondents (84%) 'agree' or 'totally agree' that animal rights should be regulated by law (i.e. not necessarily via the constitution). A further 12% expresses a neutral stance on the issue. This mirrors the situation where 84% agrees animals shouldn't be legally equal to an object. Even if 59% of respondents 'totally disagree' with such a situation, women were even more pronounced than men (Mann Whitney U, $P < 0.001$). Similarly, women were more pronounced in their support for inclusion of animal rights in the constitution (women: 92%, men: 75%; Mann Whitney U, $P < 0.001$) or other legislation (Fisher's exact test, $P < 0.001$) which is reflected in that women more often 'totally agree' with the statements in the survey.

More than half of the respondents oppose animal experimentation: 54% believe this is useful but oppose animal experiments, and an additional 28% oppose and think this is not useful. There is a striking gender difference with women being three times less likely to be supportive than men (Fisher's exact test, $P < 0.001$).

Older respondents are more likely to agree that animals can be used as entertainment (Spearman correlation, $CC = 0,129^{**}$, $P < 0.001$). Overall 65% oppose such use, and again women are clearer in their opposition (Mann Whitney U, $P = 0.001$).

Almost all respondents support stronger measures against commercial dog breeding (70% 'totally agree', an additional 20% 'agree'). The support was more pronounced among women (compared to men; Mann Whitney U, $P < 0.001$), and non-omnivores in comparison with omnivores (Kruskal Wallis, $P = 0.003$).

The clear majority (almost 80%) of respondents considered agricultural animals as important as pets. Here too, a difference could be noted between men and women: men were less in agreement that an agricultural animal is equally important (Mann Whitney U, $P=0.008$). Respondents who lived in a urban environment agreed more with the statement than those living in a rural environment (Mann Whitney U, $P=0.007$).

Respondents find animal lives as important as human lives (61% agree or totally agree). Apparently women and younger people find this more important than men and older people (Spearman correlation, $CC=-0.77^*$, $P=0.022$). In other words: the younger one is, the more one thinks that an animal life is equivalent to a human life. Building on this, a clear majority of all respondents (86%) agreed with the statement that animals can suffer in the same way as humans.

These beliefs are not always compatible with the stated lifestyles of the respondents. Indeed, 63% identified as omnivores, and an additional 23% as flexitarians. This was certainly apparent when omnivores gave high scores to the importance of animal lives: a median score of 4 (out of 5). An overview of scores across lifestyles is given in figure 1. A similar situation appeared as the majority of omnivores agreed with the statement that animals suffer in the same way as humans. However, a similar majority (74%) also indicated that meat can be produced in an animal-friendly way. Again, younger people are more sceptic towards such notion (Spearman correlation, $CC=0.119^{**}$, $P<0.001$).

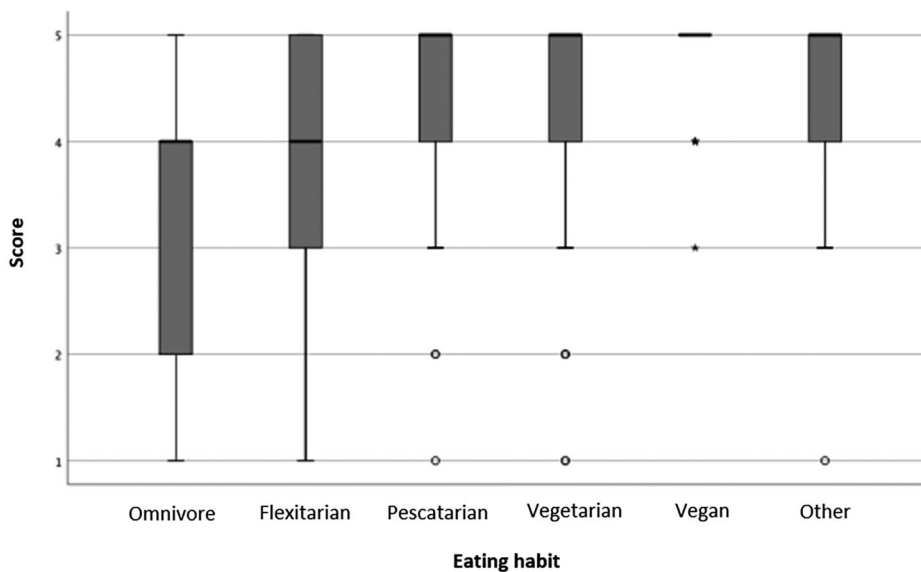


Figure 1. Scores on the statement 'Animal lives are as valuable as human lives' (5 = totally agree, 1 = totally disagree).

Section 4

In our sample, vegans are usually younger than vegetarians, and have spent less time in that lifestyle (Figure 2).

Discussion

A sufficient large subgroup was questioned, which resulted in a good representation of the population (= Flemish people). An even more representative and balanced result would have been reached with a smaller overrepresentation of the young people, and an even distribution of the sexes.

The results of our survey indicate a 4% higher support for animal rights in the constitution compared to earlier research reported by the Belgian leading animal rights action group (87% compared to 83% in Gaia, 2017). This may be the result of media campaigns about meat consumption, pets and animal shelters in the years between both surveys, but methodological differences (representativeness, Belgium vs Flanders) are more probable causes.

Very apparent throughout the study is the fact that support for animal rights is stronger among women, not only in the percentage of respondents, but also in the level of support (measured by the higher scores). Most strikingly, women are three times less likely to be supportive for animal experimentation. Similarly, younger people are almost always more supportive with regard to statements about animal welfare and animal rights.

In general, public support is high, with more than half of the respondents opposing animal experimentation and the use of animals for entertainment. Also, the majority of respondents support stronger measures against commercial dog breeding, consider agricultural animals as important as pets, find animal lives as important as human lives, and believe that animals can suffer the same way as humans.

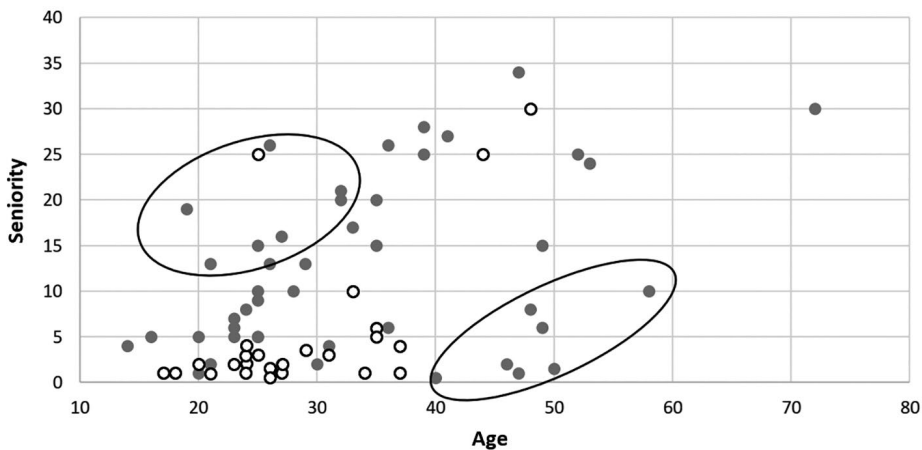


Figure 2. Age and years within a vegetarian or vegan lifestyle (vegans in open dots, vegetarians in full dots).

Conclusions

It is clear that the stated beliefs are not always compatible with the lifestyles of the respondents. Indeed, 86% of respondents regularly eat meat and other animal products. This supports the notion of a psychological disconnection between animals and meat among the consumers.

Although the sequence cannot be derived from this study, the data supports the hypothesis that people become flexitarians first, before moving on to vegetarianism, and finally to veganism. This may be inferred from the age, the time spent within those lifestyles, and the average scores given to different statements (where a gradual shift is apparent from omnivores towards vegans). Further qualitative research should be able to shed light on this trend.

In general, we can state that public support for animal rights is high in Flanders, both moral and legal rights. About 84% agree that animal rights should be regulated by law, and when presented with a binary choice, even more (87%) respondents agree that animal rights should be included in the Constitution.

References

- Animal Welfare Act (1986). 14 AUGUSTUS 1986. – Wet betreffende de bescherming en het welzijn der dieren. Consolidated version at http://www.ejustice.just.fgov.be/cgi_loi/change_lg_2.pl?language=nl&nm=1986016195&la=N
- Civil Code (2020). 4 FEBRUARI 2020. – Wet houdende boek 3 ‘Goederen’ van het Burgerlijk Wetboek. Consolidated version at http://www.ejustice.just.fgov.be/cgi_loi/change_lg.pl?language=nl&la=N&cn=2020020416&table_name=wet
- Gaia (2017). Peiling: dieren in de grondwet. [Survey: animals in the constitution]. Gaia, Brussels. Available at https://www.gaia.be/sites/default/files/campaigns/attachments/ipsos_gaia_dieren_grondwet_report.pdf
- Simonin, D. and Gavinelli A. (2019). The European Union legislation on animal welfare: state of play, enforcement and future activities. In: Hild, S. and Schweitzer, L. (Eds.), *Animal Welfare: From Science to Law*. La Fondation Droit Animal, Éthique et Sciences (LFDA), Paris, pp. 59-70.
- Verniers, E. (2019). Dierenwelzijn in de Europese Unie: geen Europees biologisch logo voor ritueel geslacht vlees [Animal welfare in the European Union: no European organic logo for meat slaughtered according to a religious rite]. *Nieuw Juridisch Weekblad*, 407: 590-597.
- Verniers, E. (2020). The impact of including animals in the constitution – Lessons learned from the German animal welfare state objective. *Global Journal of Animal Law*, [S.l.], 8. Available at: <https://ojs.abo.fi/ojs/index.php/gjal/article/view/1691>. Date accessed: 10 feb. 2022.
- Verniers, E. (2021). Dierenwelzijn in de rechtspraak van het Grondwettelijk Hof. [Animal welfare in the jurisdiction of the Constitutional Court]. *Rechtskundig Weekblad*, 18: 683-697.

36. Aspect-seeing in animal research: the absence of justice in the harm-benefit analysis

E. Linder^{1,2*} and H. Grimm^{1,2}

¹University of Vienna, Department of Philosophy, Vienna Doctoral School of Philosophy, Universitätsstraße 7, 1010 Vienna, Austria; ²Unit of Ethics and Human-Animal-Studies, Messerli Research Institute, University of Veterinary Medicine, Vienna, Medical University of Vienna, 1210 Vienna, Austria; erich.linder@vetmeduni.ac.at

Abstract

The Harm-Benefit Analysis (HBA) is a procedure used to assess research protocols involving animals used for scientific purposes on the basis of the 38th article of the Directive 2010/63/EU and corresponding Member States' legal acts. Such analysis aims at weighing the harms inflicted on the animals with the benefits that can be acquired through their use. The HBA has already faced several criticisms. A major, however often overlooked problem, is its incapacity to deal with problems of justice. This article draws from recent work on 'aspect-seeing' to shed light on how the HBA precludes us from meaningfully engaging in discourse about justice and thus prevents us from addressing the unjust treatment of laboratory animals. When engaging in aspect-seeing – like when confronted with Jastrow's famous rabbit-duck picture – we can intentionally see different aspects of the same object. Reshef Agam-Segal (2014; 2015) noted that different aspects are embedded in different normative frameworks; these, in turn, allow for different discourses and actions. Conversely, if one engages in an HBA, one relies on a particular set of conceptualisations of the animal, e.g. as a 'research tool' or 'utility receptacle', which precludes us from meaningfully talking about matters of justice; we struggle to see the animal as something that could *deserve* justice. Hence, using only the HBA for evaluating animal research forecloses us to draw from meaningful sources of moral evaluation. Animal research shows how we can become captivated by a particular picture of morality, we become, so to speak, morally short-sighted. Captivated by a specific aspect, we lose access to the plurality of values at our disposal, thereby reassuring ourselves that every moral problem has been solved. Aspect-seeing, instead, allows us to grasp such variety by exploring different aspects of the animal and therefore it allows us to attain an adequate picture of what is morally at stake.

Keywords: pluralism, utilitarianism, Wittgensteinian ethics, rabbit-duck

Introduction

The HBA is a procedure required by the European Directive 2010/63 and corresponding legal acts in the Member States in order to assess research protocol involving live animals. Such an analysis intends to weigh the harm done to the animals used against the potential benefit (or educational value etc.) acquired through such research. If the expected benefits outweigh the harms, it is permissible to proceed with the research.

The role of such analysis is that of, broadly speaking, computing the amount of utility gained or lost through the implementation of a particular project (Grimm *et al.*, 2019). The following pages intend to address one of the shortcomings of this analysis. As a matter of fact, the HBA has already faced several criticisms: It is not clear, for instance, what exactly can count as a 'benefit' since the vague meaning of the word 'benefit' leaves too much room for arbitrary interpretations. Another critique is the inconsistency

of standards in the committees that carry out the HBA and advice the authority. In fact, the same research project might be deemed acceptable by one committee and unacceptable by another (e.g. Dresser, 1989; 2019; Plous and Herzog, 2001). Furthermore, it is not clear why ethical committee members should be responsible for decisions that seem to depend on the political idiosyncrasies of the committee members. Who is to decide where research effort ought to be directed?

These issues are not intrinsic to the analysis itself. Therefore, for the sake of argument, we will concede that such problems can be solved. Consequently, the structure and the general idea of the HBA can remain intact: only relevant research should be allowed to use animals.

On the contrary, there are other issues underlying the analysis itself. It has been noticed, for instance, that while weighing the harms inflicted with the possible benefits, one is comparing goods of a different kind. What goes *in* the calculus is actual pain. What comes *out* is data. Pain is an immediate certainty. Data – on the other hand – has only the potential of being turned into ‘benefits’ (e.g. Grimm, 2015; Eggel and Grimm, 2018).

However, even in an ideal world where the HBA might function perfectly well, a problem – which we now turn to – remains. In fact, even if only one animal was sacrificed to achieve an enormous benefit, a moral problem of injustice remains.

A problem of justice

We are not committed to a specific definition of justice. Instead, we would like to work with the intuition that in the case of animal research, there is an unfair distribution of harm and benefits: it is not the harmed individual who benefits from the experiment’s results but someone else. Although animals are intentionally harmed, they do not benefit from the procedure; they do not get, so to speak, compensated – all the more if they are then killed. In utilitarian terms, we may say that utility is transferred from one individual to another, and such a transfer seems *prima facie* unfair. Cases of just harm are usually characterised by the fact that the subject either voluntarily accepts to undergo the procedure or is somehow compensated. Laboratory animals neither volunteer to be experimented upon nor are compensated in any substantial way. Therefore, in the following pages, we will not take into account the extremely rare cases in which animals benefit directly from the procedure. In these cases, the animal is indeed somehow compensated.

One may claim that it is *reasonable* to sacrifice one individual for the majority’s sake, but this is not the point. Even though one may find something reasonable and decide to act in a certain way, it would not entail that every moral issue has thereby disappeared. As William James noticed, even if we achieved a utopian society by rendering miserable only one individual for the rest of his life, there would still be a moral problem; harming that specific individual would still seem unfair (James, 1891: 333). If we were able to predict, through an HBA, that by sacrificing one individual, we would save millions of people, it might be reasonable to adopt such a line of action, but it would still be unfair for the sacrificed one. Why should *this* specific individual be sacrificed and used as a means and not another one? Such a sacrifice would seem a case of unjust and arbitrary harm.

Such a problem is a recurring theme both in the literary and the western philosophical tradition. For instance, we find it in ‘The Brother Karamazov’ (Dostoyevsky, 2003) or in John Rawls’ (Rawls, 1971) critique of utilitarianism where the tension between the greater good and the individual’s rights has been already explored in depth. Such a critique is usually put forward to reject utilitarianism as a normative theory. This is not, however, the aim of the present paper.

Section 4

We would like to resist the temptation to solve an ethical problem by rushing to a solution. Instead, we would like to linger and appreciate what moral issues emerge within a specific situation. The aim here is to explore what is at stake, why do we lose sight of matters of justice when we see through the lenses of the HBA? As a means of exploration we will rely on the Wittgensteinian notion of aspect-seeing as developed by Reshef Agam-Segal.

See this rabbit? That's what a duck looks like!

In the 'Philosophical Investigation' Wittgenstein dedicated quite a few pages on the notion of 'aspect-seeing' (Wittgenstein, 2009). The most intuitive way to become acquainted with such a notion is by experiencing it. Recall Jastraw's famous rabbit-duck picture. At first, some see a rabbit, others see a duck. Even if one can switch between the two, one cannot see both the rabbit *and* the duck simultaneously. Although the object remains the same, we can see it as something and as something else. We see different aspects of it. Agam-Segal (2014; 2015) claims that we see different things because we apply different concepts to the same object.

Before we engage in aspect-seeing, we usually see just one aspect of the picture. Then, suddenly, the other aspect – as Agam-Segal put it – 'dawns on us' (2014: 43). We clearly see something that we could not see before. We experience a new meaning as the picture gains new life. After that, we are able to shift from one aspect to the other, and we do so by *contemplating* the object in a *reflective and uncommitted* state (*ibid.*). We are not committed to saying that the picture truly represents a duck or rabbit. We playfully engage in aspect-seeing by trying out the concepts at our disposal. Such uncommitted and playful exercise is an essential characteristic of aspect-seeing. It prevents us from becoming entrenched by a particular aspect and, therefore, from losing sight of other possible aspects. As a matter of fact, when we see a duck, we cannot see a rabbit; if we were to commit ourselves that *that* picture *truly is* a duck, we would always see a duck.

Agam-Segal's account of aspect-seeing is particularly relevant for the present discussion since he claims it is possible to link it with normativity in ethics. Each concept, he notices, is tied to a peculiar normative framework. These normative frameworks are intertwined with practices and discourses that allow for or exclude connections with other concepts. Therefore, by applying a specific concept, different paths become available to us. By committing ourselves to a particular concept or aspect we are warranted in using it or talking about it in a particular way and not in another (*ibid.*). For example, if we see the picture as a duck, it will make sense to talk about its beak or to use it to illustrate what a duck looks like.

Moreover, since committing oneself to a particular aspect precludes us from accessing other aspects, using it as a duck picture would preclude us from using it as a rabbit picture. It does not make sense to say: 'Look at this rabbit picture, that's what a duck looks like!'

A research tool, a utility vessel and a patient

Engaging in aspect-seeing can help us see how using only the HBA as a means for evaluating research protocols involving non-human animals precludes us from dealing with the problem of injustice. Moreover, it allows us to become aware of the tendency to fall short in our moral thought in those situations in which we ignore the plurality of values and aspects at our disposal, and we rush towards a justification.

As a matter of fact, aspect-seeing allows us to explore the normative frameworks to which a specific conceptualisation of the animal can lead us without committing ourselves to it. Within the case of animal research, we can have access to a multiplicity of aspects of the animal, it is this fact that generates the

moral complexities of such a situation. As Cora Diamond puts it ‘a laboratory rat is neither a machine nor a person; if it were one or the other, there would be no problem how to draw the boundaries of morality’ (Diamond, 1991[1981], 346).

Although there are many aspects whose normative frameworks we could explore, for the present purposes, we will explore those aspects upon which the HBA can be meaningfully hinged: the animal as a utility receptacle or a research tool.

Both conceptualisations prevent us from meaningfully engaging some instances of moral discourses because in both cases, the value attributed to the animal is something *independent* from the animal itself. The animal becomes something replaceable that serves a function, that has a *right use* but cannot be treated in its *own right*.

Our moral grammar about rightness and justice can be used only in a secondary sense. The word ‘right’ is embedded in a different semantic network. We use a tool in the right way when it fits within the proper chain of actions that lead to a set end. Tools are mere means. The same problem goes for utility vessels; we are not interested in where utility is allocated. We are interested in how much such utility can contribute to its maximisation. It does not make sense to be concerned about a specific receptacle since it is not the vessel’s value we are interested in.

On the contrary, if we were to conceptualise the laboratory animal with Tom Regan’s notion of subject-of-a-life and inherent value (Regan, 2004), we would be allowed to meaningfully speak about the animal as a right bearer and as something that can be treated with fairness and justice.

However, the latter conceptualisation is incompatible with the HBA since the *ratio* of such analysis presupposes that what is of ultimate value is the maximisation of utility. This entails that the individual’s rights can come into consideration only secondarily if the principle of maximising utility is satisfied.

Utility is not thought of as something that belongs intrinsically to someone. As a matter of fact, that ‘someone’ is not relevant were it not for the fact that it can ‘hold’ utility. But by being conceptualised as a recipient or a tool something loses the possibility of being meaningfully thought of as something that can deserve a just treatment.

By conceptualising the animal as a tool or a utility receptacle, one loses the possibility of using the word ‘right’ in its primary sense. That is, within a discourse that includes concepts like ‘justice’ or ‘merit’. In this sense, matters of justice become elusive when we conceptualise an object as a tool or as a utility receptacle. As a result, we deprive ourselves of the proper hinge to talk about justice.

Using the HBA as the only means of evaluating research protocols involving non-human animals makes us blind to some element of our moral landscape because it relies on the commitment to a particular aspect.

Conclusions

Aspect-seeing allows us to become aware of those aspects we lost sight of by trying out different concepts when dealing with complex moral problems. This allows us to see on what concepts a particular justificatory discourse is hinged upon and to show how the sole use of the HBA is indeed somewhat factious since it relies on a particular aspect of the animal that does not allow us to engage in meaningful discourse about justice. This is, in a given context, understandable; however, it would be wrong to claim that any problem of justice has thereby disappeared. The fact that we find some sort of justification does

Section 4

not mean that every moral problem is solved. Again, a reasonable choice might not be a just choice. It is indeed sufficient to see the animal in a different light, e.g. as a subject-of-a-life, to see the problem again, as something that ought to be treated justly. We can uncover the contingent *status* of our current ways of conceptualising animals by engaging in aspect-seeing. A reflection upon the contingency and precariousness of our justificatory tools allows us to broaden our moral landscape by opening up the possibility of making other conceptualisations available. Engagement in aspect-seeing outlines itself as an important attitude of the moral agent who seriously wishes to contribute to a democratic and pluralistic debate over morally complex issues. Furthermore, we hope to have shown how applied ethics can profit from Wittgensteinian thinking. In fact, although there is indeed a need for further research, such thinking can provide helpful insights to explore moral complex issues such as the intricacies surrounding the HBA and animal ethics in general.

References

- Agam-Segal, R. (2014). When language gives out: conceptualization, and aspect-seeing as a form of judgement. *Metaphilosophy* 1, 2014: 41-68.
- Agam-Segal, R. (2015). Aspect-perception as a philosophical method. *Nordic Wittgenstein Review*. 4 (1), 2015: 93-121.
- Dresser, R., (2019) Putting the ethical principles in practice. In Beauchamp, T. L. and DeGrazia, D. *Principles of animal research ethics*, Oxford University Press, Oxford, United Kingdom.
- Diamond, C. (1991 [1981]). Experimenting on animals: a problem in ethics. In: Diamond, C., *The realistic spirit: Wittgenstein, philosophy and the mind*. Cambridge, MA: MIT Press.
- Dresser, R., (1989) Developing standards in animal research. *Review Journal of the American Veterinary Medical Association* 194: 1184-1191.
- Dostoyevsky, F. (2003) *The brothers Karamazov*. Penguin, London, United Kingdom.
- Eggel, M. and Grimm H. (2018) Necessary, but not sufficient. The benefit concept in the project evaluation of animal research in the context of Directive 2010/63/EU. *Animals* 8.3: 34.
- European Commission (2010), Directive 2010/63/EU of the European Parliament and of the Council of 22 September 2010 on the protection of animals used for scientific purposes. Brussels, Belgium.
- Grimm, H. (2015) Turning apples into oranges? The harm-benefit analysis and how to take ethical considerations into account. *Alternatives to Laboratory Animals* 43.2: 22-24.
- Grimm, H., Olsson, I.A.S. and Sandøe, P. (2019). Harm-benefit analysis – What is the added value? A review of alternative strategies for weighing harms and benefits as part of the assessment of animal research. *Laboratory Animals*, 53(1): 17-27.
- James, W., (1892). The moral philosopher and the moral life. *The International Journal of Ethics* 1.3: 330-354.
- Plous, S. and Herzog, H. (2001). Reliability of protocol reviews for animal research. *Science* 293.
- Rawls, J. (1971) *A theory of justice*. Harvard University Press, Cambridge.
- Regan, T. (2004). *The case for animal rights* (2nd ed.). University of California Press, Berkeley.
- Wittgenstein, L. (2009 [1953]). *Philosophical investigations* (Rev. 4. ed.). Oxford: Wiley-Blackwell.

37. Constrained, contingent, and conflicted: complicating acceptance of animal research through an analysis of writing from the UK Mass Observation Project

R. McGlacken

School of Sociology and Social Policy, University of Nottingham, University Park Campus, NG7 2RD, United Kingdom; renelle.mcglacken@nottingham.ac.uk

Abstract

How UK publics feel about animal research is often explained in terms of ‘acceptance’ or ‘opposition’, with polls and surveys being widely used to measure levels of acceptance towards the issue across time, location, and demographics. Such studies and the reporting of their findings routinely overlook the contexts in which such expressions of acceptance emerge, the expectations that are built into it, and the feelings that infuse it. This paper aims to complicate understandings of acceptance in this area by examining how ‘acceptance’ towards animal research is constrained by claims that there is a current lack of alternatives, contingent on the development of tangible and timely clinical outputs, and complicated by moral conflict and ambivalence. To do so, I draw on a qualitative analysis of writing on animal research from the Mass Observation Project, a UK national life-writing project. I conclude that common representations of ‘acceptance’ around animal research are problematic and argue that without consideration of the conditions and contextuality of expressions of acceptance, important socio-ethical concerns towards and expectations of animal research are likely to be left unaddressed in science-society dialogues and decision-making. This risks undermining the bioscience community’s emphasis on fostering better communication and engagement with publics and, further, corroding the social contract seen as legitimising the scientific use of animals.

Keywords: public opinion, science-society, animal experimentation

Introduction

The concept of ‘public opinion’ is a valuable resource in UK societal dialogue around animal research and its construction in binary terms of acceptance and opposition has power for legitimising stakeholder positions on the issue (Hobson-West, 2010; McGlacken and Hobson-West, 2022). However, such dualisms do not accurately capture or represent the nuance of thought and feeling towards animal research. As well as minimising and dismissing ambivalence around animal research, this for/against dichotomy simplifies what ‘acceptance’ of this use of animals means. As this paper will suggest, rather than signifying support or satisfaction, expressions of acceptance of animal research should be understood as constrained by arguments of the current necessity of animal models and lack of choice, contingent on expectations of tangible clinical outputs, and often conflicted.

This paper aims to complicate claims that ‘people in Great Britain are generally very accepting of the use of animals in research’ (Williams, 2020a) and emphasise that we cannot be complacent with assertions that publics accept animal research as necessary when no alternatives are available (Ipsos MORI, 2018; Williams, 2020b). To view national polling and survey data as signalling a broad ‘public acceptability’ (Clemence and Leaman, 2016) of animal research is to minimise the constraints which border such ‘acceptability’, its multiple contingencies, and how it is often vexed by ambivalence. To illustrate some of the issues with common understandings of acceptance towards animal research, this paper will draw on a qualitative analysis of writings from The Mass Observation Project (MOP) on the topic of ‘using animals in research’.

Methods

This paper is based on a qualitative analysis of writing from the Mass Observation Project (MOP), a national life-writing project based in The Keep, an archive at the University of Sussex, UK. With its voluntary panel of writers – ‘Mass Observers’ – the MOP aims to document ‘everyday life in Britain’. Observers are asked to write about a diverse range of topics through seasonal ‘Directives’, a set of questions or prompts on a particular topic. Most Directives feature two or three topics split into separate sections, e.g. in the Summer 2016 Directive, the responses to which this paper analyses, Part A of the Directive was on ‘Using animals in research’ and Part B was on ‘Being thrifty’. The panel does not aim to be representative of the UK population and in 2019 there were 310 active writers on the panel, a high representation of whom were female, over the age of 61, and located in South East England (Mass Observation, 2019). In qualitative studies of societal relations and understandings such as this, of most value is the MOP’s capacity to produce rich accounts, with many Observers’ ‘attentiveness to context’ generating ‘reflexive and considered accounts of social life’ (Kramer, 2014: 1).

Commissioned by the University of Nottingham, the ‘*Using animals in research*’ Directive (Mass Observation Project, 2016) received a total of 159 responses (72 postal and 87 electronic). In analysing the responses, this study takes a constructionist thematic analytical approach, recursively following Braun and Clarke’s (2006: 87) steps of: (1) familiarising yourself with your data; (2) generating initial codes; (3) searching for themes; (4) reviewing themes; (5) defining and naming themes; and (6) producing the report. In reproducing excerpts from responses to the 2016 Directive on ‘Using animals in research’, I refer to Mass Observers by the anonymous identification numbers issued by the MOP. In illustrating how expressions of acceptance towards animal research in the MOP writings were often constrained, contingent, and conflicted, this paper is organised in three sections examining these overlapping themes.

Constrained

A key constraint shaping expressions of acceptance of animal research are claims that current use of animal models is necessary and that full replacement cannot yet be implemented (Barré-Sinoussi and Montagutelli, 2015). The Animals in Scientific Procedures Act 1986 (A(SP)A), the legislation regulating UK scientific animal use, states that project licences are only granted on the condition that ‘the specified programme of work does not involve the application of any regulated procedure to which there is a scientifically satisfactory alternative method or testing strategy not entailing the use of a protected animal’ (Home Office, 2014: 37). However, there is argument of widespread failures in exploring suitable alternatives (Knight, 2011) and also underfunding of their development (Taylor, 2014; Taylor, 2019), thus maintaining reliance on animal models. This dispute reveals the socio-political aspects of the ‘necessity’ of animal models, highlighting how reliance upon them is a not simply a neutral fact. Yet, dominant arguments that animal use is currently necessary for scientific and medical advancement understandably constrain perspectives on and relations with animal research.

In the MOP writings, expressions of acceptance towards animal research were often bound up with hopes and expectations of replacement, with many Observers gesturing to the development of non-human animal alternatives and future full replacement. As these excerpts demonstrate:

My hope is that science will come up with solutions to make animal testing redundant. I think technology is advancing in this direction and I feel fairly confident it will happen during my lifetime.
(Mass Observer C3210)

In terms of openness and educating the public, I think vivisection is something people don't *want* to think about. I know I don't like to. It is a necessary evil – if my husband or my baby niece got ill I probably wouldn't care how many animals had died in the name of research – but I hope it will become less necessary as *in vitro* and computer modelling techniques improve. (Mass Observer C5847)

Such writing signals that even those who are accepting of scientific animal use may still hope and expect that animal models are replaced in the future. Indeed, hopes for future replacement of such animal use may actually *permit* acceptance in the here-and-now, with assumptions that their involvement will one day no longer be needed enabling their current use to be tolerated as a 'necessary evil' (Blakemore, 2008; Masterton *et al.*, 2014; Franco and Olsson, 2016). If we frame this future imaginary as part of an 'anticipatory regime', a discourse about the future which demands a response (Adams *et al.*, 2009: 249), then lay investment in the future replacement of animal models calls for further attention to this area in the present.

In recognising lay investment in alternatives and replacement, the emphasis that research advocacy groups like Understanding Animal Research (UAR) place in statements such as 'Animal research can only be carried out in the UK where there is no suitable non-animal alternative' (UAR, 2014) and a 'large proportion of the UK public accept the use of animals for research as long as there is no unnecessary suffering and there is no alternative' (Williams, 2020b) as signifiers of public acceptance is undermined. With any claims of 'public acceptance' of animal research hinging on the argument that animal models are (currently) necessary, and with hopes for their future replacement, the claimed necessity of animal research cannot itself be seen as an unproblematic guarantor of societal support.

Contingent

Acceptance of animal research is also highly contingent – a point made by the regular Ipsos MORI polls on UK public attitudes to animal research which state that 'public acceptability is contingent on the purpose and context of the research' (Ipsos MORI, 2018: 6). This analysis of MOP writing found that a key condition of expressions of acceptance towards animal research was not only the purpose of such research but its delivery of tangible and timely medical advances. As I have discussed elsewhere (McGlacken, 2021a), the necessity of animal research was often understood by Mass Observers as integral to resisting human health vulnerabilities, mattering not only in terms of caring about one's own health but in caring about the health of others (McGlacken, 2021b).

In expressing acceptance towards the use of animals to generate important medical outputs, some Mass Observers simultaneously discussed their concerns towards research activities without clear applications. Basic research was implicitly described by some as disconnected from developing clinical treatments and thus less justifiable. As the following Observers describe –

I've always had very mixed feelings myself. I really don't like the thought of it at all and when you read some of the horrific stories of the type of experiments carried out in the name of research it makes you very angry. But I do feel that trying out drugs or surgical procedures on animals prior to their use on humans is a valid option, but I don't agree with experiments just for the sake of it to see what happens. (Mass Observer R1025)

I am not against using animals in research but I think there should be a specific rationale and goal in mind that is, at least potentially, likely to be of benefit to mankind or, indeed, other animals. This would be along the lines of medical research into combating diseases, developing vaccines and improving treatments. (Mass Observer R4526)

Section 4

Both Observers articulate concerns towards the purposes of research using animals. In both excerpts, legitimate reasons for using animals in experiments are constructed in terms of developing and safety-testing medical treatments for human health issues. Such writing suggests that animal research is made acceptable by witnessing tangible clinical outputs. That benefits of animal research may be understood as part of a promised future of medical progress, ambivalences over basic research suggest that this future cannot be too distant or vague. Given that in 2019, over half (57%) of the experimental procedures involving animals conducted were categorised as for basic research (Home Office, 2020: 10) such anxieties warrant consideration.

Despite the claimed interdependence of basic and translational research (Flier and Loscalzo, 2017), with some in the bioscience community rejecting ethical distinctions between the two (Cressey, 2011: 453), this analysis of MOP writing shows that distinctions between these forms of research matter in everyday understandings of animal research. Indeed, the development of tangible medical benefits suggested by 'applied' research may help individuals justify the harms that are inflicted upon animals. This has implications for the harm-benefit analysis (HBA) underpinning the ethical review of animal research in the UK and EU, with the anticipatory nature of the process meaning that the delivery of benefits is always subject to uncertainty (ASRU, 2015: 17). Indeed, Eggel and Grimm (2018: 11) recommend the replacement of the HBA with a 'harm-knowledge-analysis' (HKA) through which 'the inflicted harm on animals would be weighed against and justified by the expected knowledge gain, the importance of which 'would be qualified by its impact on a given research field or research objective (i.e. important human interests)'. Such a reworking of the HBA may stimulate efforts to identify what constitutes valid societal benefits and to conduct retrospective evaluations of whether such expectations of benefits are being met. Focus here is of significance considering arguments that 'At present, societal concerns relevant to harms and benefits [...] are not well defined' (ASC, 2017: 62).

Conflicted

With views on animal research commonly portrayed as irreconcilably polarised (for critique of this in UK and US contexts, see Marris, 2006; Levin and Reppy, 2015; DeGrazia and Beauchamp, 2019), ambivalence around animal research has often been neglected (McGlacken, 2021a: 106). Yet, this analysis of MOP writing reveals the ubiquity of ambivalence towards the issue, with many Mass Observers feeling conflicted in accepting *or* rejecting animal research. As the following MOP excerpts suggest, acceptance of the need to use animals in research does not necessarily represent contentment or acquiescence with the practice –

As for which animals should be used or not used in research purposes then none should be used would be the ultimate aim, but then how would new drugs be tested and introduced to society. Not an area I have thought about, it is difficult if a loved one or I became very ill and no drug was available or a new one may be being developed then testing would certainly be considered however should animals be tested on, no oh what a dilemma. Feel I am not being useful in this topic. (Mass Observer C4988)

I'll never feel entirely comfortable with the fact that creatures have probably been harmed and made to suffer so that I can be healthy and feel well. (Mass Observer N5744)

These excerpts suggest that, for some, rather than providing reassurance in justifying the practice, thinking about the issue through the frame of (animal) harms and (human) benefits, appears to be a key aspect of why animal research is discomforting or distressing. As Michael and Brown (2004) have shown views on animal research do not always fit within the frame of harms and benefits. Relating to the last section's discussion of how acceptance here may hinge on witnessing clinical outputs, these

excerpts illustrate how although animal research might be seen as acceptable for such purposes, such acceptance does not always sit easily.

Conclusions

This analysis indicates that expressions of acceptance towards animal research may be constrained through a present lack of choice otherwise, contingent on tangible and timely clinical outputs, and conflicted by moral trouble. Overlooking the contexts through which ‘acceptance’ of animal research emerges, its material conditionalities, and the discomfort that still surrounds it means that societal concerns are likely to be left unidentified and unaddressed in science-society dialogues around the issue. This risks undermining recent emphases on cultivating better communication around animal research and weakening the social contract on which legitimate scientific practice rests. Furthermore, this has implications for the harm-benefit analysis in the ethical review process, which requires development to better define and examine societal concerns. Going forward there is a need for further qualitative research exploring relations with animal research beyond for/against binaries and more scrutiny of key prerequisites for ‘acceptance’ of animal research: that such use causes no ‘unnecessary suffering’, a point beyond the scope of this paper, and that there are no alternatives.

Acknowledgements

My thanks to the Mass Observers and archivists at The Keep. The commissioning of the MOP Directive analysed here was funded via a Leverhulme Trust grant (grant number RP2011-SP-013). This research was supported by the Wellcome Trust (205393/B/16/Z).

References

- Adams V, Murphy M and Clarke AE. (2009). Anticipation: Technoscience, life, affect, temporality. *Subjectivity* 28(1): 246-265.
- Animals in Science Committee. (2017). Review of harm-benefit analysis in the use of animals in research. <https://www.gov.uk/government/publications/harm-benefit-analysis-animals-in-science-committee-review>: Home Office.
- Animals in Science Regulation Unit. (2015). Identification and Management of Patterns of Low-level Concerns at Licensed Establishments. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/512098/Patterns_low-level_concerns.pdf: Home Office.
- Barré-Sinoussi, F and Montagutelli, X. (2015). Animal models are essential to biological research: issues and perspectives. *Future Science* 1: 1-3.
- Blakemore, C. (2008). A necessary evil. Available at: <https://www.theguardian.com/commentisfree/2008/may/31/anecessaryevil>. Accessed 10th January 2022.
- Braun, V and Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology* 3(2): 77-101.
- Clemence, M and Leaman, J. (2016). Public attitudes to animal research in 2016. <https://www.ipsos.com/en/public-attitudes-animal-research-2016>: Ipsos MORI:1-63.
- Cressey, D. (2011). Animal research: Battle scars. *Nature* 470(7335): 452-453.
- Eggel, M and Grimm, H. (2018). Necessary, but Not Sufficient. The Benefit Concept in the Project Evaluation of Animal Research in the Context of Directive 2010/63/EU. *Animals* 8(3): 34.
- Flier, JS and Loscalzo, J. (2017). Categorizing biomedical research: the basics of translation. *FASEB journal* 31(8): 3210-3215.
- Franco, N and Olsson, A. (2016). Killing animals as a necessary evil? The case of animal research. In: Meijboom, FLB and Stassen, EN (eds) *The end of animal life: a start for ethical debate*. Wageningen Academic Publishers, 187-202.
- Hobson-West, P. (2010). The role of ‘public opinion’ in the UK animal research debate. *Journal of Medical Ethics* 36(1): 46.
- Home Office. (2014). Consolidated version of the Animals (Scientific Procedures) Act 1986. <https://www.gov.uk/government/publications/consolidated-version-of-aspa-1986>: Home Office.

Section 4

- Home Office. (2020). Annual Statistics of Scientific Procedures on Living Animals Great Britain 2019. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/901224/annual-statistics-scientific-procedures-living-animals-2019.pdf: Home Office.
- Ipsos MORI. (2018). Public attitudes to animal research in 2018. News & Polls: <https://www.ipsos.com/ipsos-mori/en-uk/public-attitudes-animal-research-2018> 1-36.
- Knight, A. (2011). The costs and benefits of animal experiments. Basingstoke: Palgrave Macmillan.
- Kramer, A-M. (2014). The Observers and the Observed: The 'dual Vision' of the Mass Observation Project. *Sociological Research Online* 19(3): 1-11.
- Levin LH and Reppy, WA. (2015). Reforming the politics of animal research. *J Med Ethics* 41(7): 563-566.
- Marris, E. (2006). Animal research: grey matters. *Nature* 444(7121): 808-810.
- Mass Observation (2019) Bulletin Winter 2019 Issue 23. <http://www.massobs.org.uk/about/bulletin>: Mass Observation.
- Masterton M, Renberg T and Källemark Sporrang S. (2014). Patients' attitudes towards animal testing: 'To conduct research on animals is, I suppose, a necessary evil'. *BioSocieties* 9(1): 24.
- McGlacken, R. (2021a). Exploring everyday relations with animal research: a sociological analysis of writing from the Mass Observation Project. University of Nottingham, <http://eprints.nottingham.ac.uk/66576/>.
- McGlacken, R. (2021b). (Not) Knowing and (Not) Caring About Animal Research: An Analysis of Writing From the Mass Observation Project. *Science & Technology Studies*.
- McGlacken R and Hobson-West, P. (2022). Critiquing imaginaries of 'the public' in UK dialogue around animal research: Insights from the Mass Observation Project. *Studies in History and Philosophy of Science* 91: 280-287.
- Michael, M and Brown, N. (2004). The meat of the matter: grasping and judging xenotransplantation. *Public Understanding of Science* 13(4): 379-397.
- Taylor, K. (2014). EU member state government contribution to alternative methods. *ALTEX* 31(2): 215-218.
- Taylor, K. (2019). *Recent Developments in Alternatives to Animal Testing*. Leiden: Brill, 585-609.
- Understanding Animal Research (2014) Forty reasons why we need animals in research. Available at: <https://www.understandinganimalresearch.org.uk/why/forty-reasons-why-we-need-animals-in-research>. Accessed 10th January 2022.
- Williams, AJ. (2020a). High public acceptance of animal research to find treatments for COVID-19. Available at: <https://www.understandinganimalresearch.org.uk/news/high-public-acceptance-of-animal-research-to-find-treatments-for-covid-19>. Accessed 10th January 2022.
- Williams, AJ. (2020b) Public attitudes to animal research under COVID-19: Survey report. <https://www.understandinganimalresearch.org.uk/news/communications-media/survey-shows-high-public-acceptance-of-animal-research-to-find-treatments-for-covid-19/>. Accessed 15th January 2022.

38. Monetarisisation of ethical values in animal farming

H. Röcklinsberg^{1*}, S. Jørgensen¹, H. Ahmed^{2,3}, K. Alvåsen², C. Berg⁴, H. Hansson⁵ and U. Emanuelson²
¹Department of Animal Environment and Health, Swedish University of Agricultural Sciences, P.O. Box 7068, 750 07 Uppsala, Sweden; ²Department of Clinical Sciences, Swedish University of Agricultural Sciences, P.O. Box 7054, 750 07 Uppsala, Sweden; ³FAO, House No. 373, EE Block, DHA Lahore, Pakistan; ⁴Department of Animal Environment and Health, Swedish University of Agricultural Sciences, P.O. Box 234, 532 23 Skara, Sweden; Department of Economics, Swedish University of Agricultural Sciences, P.O. Box 7013, 750 07 Uppsala, Sweden; helena.rocklinsberg@slu.se

Abstract

Farm animal welfare (FAW) is crucial not only for the animals themselves, but also for farmers, many consumers and society. Views differ, however, regarding how to define FAW, what is an ethically acceptable level, which further values it is linked to, as well as regarding methods and goals of implementation of welfare standards. In this study, we reflect upon challenges in transforming ethical values (here FAW) into monetary terms. Our point of departure is a presentation of results from small focus groups we conducted with farmers, retailers, policy influencers and policy makers on FAW and on three hypothetical suggestions of legislation to improve cattle welfare. Stakeholders reveal a wide variety of views on FAW and suggested improvements. This leads us to a discussion on values related to FAW, such as farmer's autonomy in relation to regulation, biodiversity and use of antibiotics, as well as a need to consider the consumer-citizen gap. We argue that even if an intrinsic value of the animals cannot be 'priced', FAW is related to other values more easily given a price, and that a common currency and a control system, facilitates ensuring societal transparency and trust.

Keywords: farm animal welfare (FAW), ethical value, monetary value, legislation

Introduction

Farm animal welfare is a highly political issue that engages not only farmers and animal welfare organisations, but also consumers, retailers and politicians. One recent sign is the citizen incentive End the Cage Age signed by 1,4 million leading to an EU Parliament decision to phase out e.g. sow crating and caging of rabbits and layers (2021/2633 (RSP)) until 2030. The forthcoming legislation needs to consider a complex mix of values: 'any change in housing systems should achieve a balance between several aspects of sustainability, i.e. animal welfare, animal health, environmental protection and farmers' competitiveness' (clause R). Given FAW is often severely compromised in modern farming practices, partly due to intensification in order to reduce production costs and to meet competition on an international food market, the relation between good FAW and low use of Antibiotics (AB) (Albernaz-Gonçalves, 2022) is another key component for revised legislation. However, the gap between citizens' requests for better FAW legislation or market forces and consumers' actual purchase of these products (Cornish *et al.*, 2019), sends disparate signals to the policy makers and makes profitability while maintaining good FAW a difficult task for farmers. In a recent research project we focus on the relation between FAW and financial sustainability at cattle farms in the light of revised legislation (Ahmed *et al.*, 2020, 2021). Which parts of the farming system cause welfare impairments and what would be the economic effect on farm level of improved FAW? Three hypothetical suggestions for legislation were investigated: increased space, maximum of 30% concentrate and increased mandatory grazing time. Using a stochastic partial budgeting approach to calculate costs of improved AW for different cattle farming systems we found that increased AW comes with a direct cost to the farmer. Market mechanisms and governmental subsidies and are tools worthy of sincere consideration to engage farmers in FAW

Section 4

improvements (ibid). Moreover, above being a practical issue, the situation rests on the very idea of converting an ethical value (here FAW) to monetary terms. It is usually argued that such a conversion of ethical values is not easily done, if at all possible, at least not in the case of intrinsic values (regarding something that is valuable in itself) (Spangenberg and Settle, 2016). Given the well-established ethical point of departure, that pleasure is better than suffering, the question remains how to understand AW as an intrinsic value and how to transform it to monetary terms? Here the dichotomy citizens-consumers (the gap between attitudes and behaviours) is relevant. Cornish *et al.* (2019) offer an interesting approach by applying the behaviour change wheel (where capabilities, opportunity and motivation are at the core) to match with 'intervention functions' such as education, enablement and persuasion. They are in turn facilitated by seven policy categories, e.g. legislation, guidelines and market communication in order to decrease the gap in favour of high FAW products. The authors further show, at hand of a literature review, that consumer behaviours are highly influenced by social norms, rather unstable and differ between product categories. Five drivers for supporting high welfare products are suggested: food safety, quality, provenance, health and palatability (taste) to influence consumers. Most probably they also influence farmers and other stakeholders. Further, a study of labels of egg packages showed consumers are more ready to boycott products from what was perceived as low welfare standards (caged hens), than to actively promote high welfare products (free range hens) (Schöll *et al.*, 2013). Given these findings, as typical examples of the vast literature on consumer behaviour, one can also note that the ethical dimensions of the link between FAW as an ethical value *and* a monetary value are far less explored.

Stakeholder views of FAW and suggested hypothetical welfare improvements

In order to know more about how core stakeholders in Sweden perceive FAW and possible ways to improve it by revising housing standards we conducted focus group interviews via video-link with four stakeholder groups on FAW in autumn 2020. Participants represented policy makers (members of the parliament's board of environment and agriculture, n=4), policy influencers (from e.g. farmer advisory companies and animal welfare organisations, n=7), farmers (incl. farmer's interest organisations, n=8) and retailers (two large food chains in Sweden and one distributor, n=3). A member of the project team skilled in FAW but without any previous relation to the informants conveyed the meetings, all with the same structure and length of 60 minutes: a brief presentation of the project and the hypothetical discussion format, questions on definitions of FAW, and finally a discussion of three hypothetical suggestions for new legislation aiming at improved animal welfare in beef and cow-calf operations. These were selected based on literature study (Lundmark, 2017) and interviews with animal inspectors at the Swedish County Administrative Boards regarding which FAW issues are most frequent in these systems and formulated as follows:

- minimum standard of space increases with 25%;
- maximum 30% of dry matter substance feed allowed as concentrate;
- minimum number of days of grazing increases with 30 days (for all animal categories where grazing is mandatory).

Given the richness of the material, we aim for an overview of the most commonly held views on FAW and the three suggestions, as deduced by two researchers, one of whom conducted the meetings, independently watching and summarising the video material.

Before going into details, it is worth mentioning that there was a large variation between stakeholder groups on how they perceived the three examples of hypothetical legislation, and the relevance of having hypothetical discussions of the three suggestions. The farmers turned out to be more sceptical on both these points than all other groups, whereas the policy influencers seemed most positive in terms of engagement and acceptance of the hypothetical discussion format.

Perception of FAW

How do stakeholders define it, in what respect can it be regarded as important, and do they see other means than legislation to ensure good FAW? The *retailers* agreed that there is no single definition of FAW, and different views have to be respected, not least since it is a 'moving target', for ex. fish welfare was not an issue some years ago. They further stressed that, since FAW is important for consumers; transparency and a good dialogue with the farmers is important. It was argued that since requirements are easy to fulfil and that there is a general awareness of Sweden's comparably stricter FAW legislation this discussion had not been very difficult. However, FAW is also a sensitive issue for retailers and a key value for long-term survival, for instance through its link to antibiotic resistance and climate, partly due to environmental and animal rights organisations. *Farmers* considered health to be the basis of FAW, and some argued that reproduction and longevity were the most relevant measurements and signs of healthy animals, whereas others instead held the importance of no 'waste' in terms of dead animals on the farm. Further 'animals in balance', the importance of mother and offspring living together, and the core role of breeding for animal welfare were highlighted. They stated that assessing FAW requires long animal experience and hence consumers' views might well be misleading. The group of *policy influencers* distinguished between limiting negative welfare by protection from hunger, discomfort and stress, and enabling positive welfare in terms of mental and physical well-being, including the possibility to perform natural behaviours, stating that the latter is required to ensure good subjective experiences, e.g. by meeting species-specific needs. They further reflected upon whether FAW reflects the very basis for achieving levels set by legislation, or if legislation ensures only a minimum level and 'real' welfare is added on top of that. By explicit use of references to scientific literature we conclude they regard it possible to perform an objective assessment of animal welfare. The *policy makers* also stressed the importance of health and possibility to perform natural behaviours during the entire lifetime of an animal as crucial elements in the societal debate, but also for high productivity and economic gain. Legislation and good farmers were thought of as the backbone in ensuring this, and deviations implying reduced animal welfare should be handled correctly. They further mentioned that Sweden's early decision of restricting AB to animals is a competitive advantage today and relevant for farming sustainability. On that note, it was stated that decreased welfare might not be the goal, but rather a necessary outcome to achieve increased competitiveness, and allowing reduced or zero grazing periods was mentioned as one such example. They briefly discussed the question of natural behaviour, specifically whether modern breeds might have other innate behaviour patterns, and as such other needs, than traditional breeds.

Suggestion 1 (25% increase in indoor area)

Retailers, Farmers and Policy makers alike stressed an implementation of increased area would imply higher costs for the farmers and hence consumers, and that the means to reach the goal would be to house fewer animals rather than enlarging farm buildings (unknowingly in line with the economic calculations made in the research group). On the other hand, it might imply lowering use of AB thanks to cleaner and healthier animals. *Farmers* expressed the suggestion was very far-fetched. Good welfare overall (in terms of longevity or number of dead animals) was stressed, stating that the exact area is not the critical issue, rather the specific conditions at the farm matters, and, cattle farms often have larger areas than required, not least for a safer working environment. *Retailers* focussed on the need for communication with consumers regarding the relation between increased cost and improved animal welfare. If this fails, the share of imported (cheaper) meat will increase. The communication was in focus also by the *policy influencers*, arguing that most consumers think cattle have more space than they actually have, and prohibiting tie stalls or making outdoor access mandatory would be easier to communicate. They also listed a number of possible welfare benefits for both animals (health, cleaner lying areas, more space to move and fewer conflicts) and argued an overall systematic change is required to achieve good cattle welfare. *Policy makers* agreed in principle, but did not have the knowledge of whether 25% would be

Section 4

possible, but if, probably require costly subsidies if implemented. They also expressed climate concerns arguing that higher prices and fewer animals would decrease meat consumption, and that a common holistic approach and EU-regulation on minimum space would be preferable.

Suggestion 2 Max 30% of feed from concentrate

This question needed further specification regarding what the research group considers as concentrate (as definitions vary) *farmers* claimed. They didn't discuss the proposition in detail, but briefly commented that they neither see the welfare implications of such a measurement, nor think it a suitable issue for legislation. Rather, a farmer will adjust the feeding regime if the cattle need more roughage, and this is a question for the market in terms of meat quality. *Policy influencers* on the other hand were positive, mentioning it implies longer eating time and, if combined with grazing, contributes to biodiversity. They also raised the question of breeding for sustainable cattle. The *retailers* found the issue and a certain percentage difficult to communicate to consumers, specifying that the meat quality is affected by feed composition and that such a requirement might be difficult for farmers during dry seasons, leading to a suggestion of a yearly average of 30%. The connection to healthy animals leading to potentially decreased levels of AB use was found positive, and also mentioned by *policy makers*.

Suggestion 3 Increase mandatory grazing with 30 days

This suggestion evoked various responses. Whereas the farmers found it provoking and revealing the project group's lack of knowledge about animal welfare, the *policy makers*, *policy influencers* and *retailers* were overall positive. They thought it would be beneficial for animal health and welfare as well as lead to decreased use of AB, increased biodiversity and be appreciated by consumers. *Policy makers* and *influencers* thought adaptation to conditions at the farm and geographical position in Sweden would be necessary. The *policy influencers* further mentioned a risk that slower growth rate due to more grazing might have a negative impact on the environment. *Retailers* found this suggestion easier to communicate, but that lack of knowledge about differences between Sweden and other countries and limited household budgets would limit purchase if more expansive.

Relating FAW to other ethical values

The focus groups reveal some disagreements between stakeholders concerning FAW as a relative value. All stakeholders agreed that FAW is important but *policy influencers* were most explicit that FAW is important in itself, and should be promoted also at a risk of higher monetary costs for farmers and consumers. *Retailers'* focus on communication highlights that even if a certain regulation might improve FAW, it is of little use to producers, retailers and consumers if it is difficult to explain, since it will not contribute to increased purchase. That is, not any FAW improvement will be perceived by consumers as an added ethical value to the product, and hence not possible to transform to a monetary value. This point was of course relevant also for *farmers* and *policy makers*. The latter group, however revealing disparate views in many issues, overall stressed FAW as a piece in a larger agricultural and societal puzzle of limiting use of AB, increasing biodiversity and reducing import, as means to promoting Swedish food production. Further, the three suggestions were regarded by all groups, except the *farmers*, to contribute to increased biodiversity and restricted use of AB as a result of improved FAW.

Whereas our stakeholders regard biodiversity and reduction of AB use important, the five consumer behaviour drivers (food safety, health etc.) listed by Cornish *et al.* (2019) are only indirectly mentioned. There was some overlap between *farmers'* view of FAW (in terms of health), and food safety, human health and food quality as related to AB use, but provenance was only touched upon in terms of risks

for import, and FAW relation to taste was barely mentioned. While *farmers* were reluctant to see the welfare relevance of the three suggestions, they indirectly pointed at other ethical values, such as farmers' *autonomy* and need of *societal trust in farming practices*, as a criticism of control systems and regulation. It however remains an open question whether such values can be taken into account in monetarisation. Less regulation and control would imply limited transparency to society, since variation between farms would increase and restrict citizen possibilities to gain knowledge about the FAW levels. This in turn would imply difficulties to communicate the overall level of FAW, even if it would be very high, other than per individual farm. Consequently, a gap would grow between the (autonomous choices of the) individual farmers on the one hand and consumers' knowledge about the actual FAW on the other. Hence, there seems to be disparate views on the relevance of regulation in relation to autonomy: whereas farmers perceive control and regulation as limitation of autonomy and a sign of lack of societal trust, it is required by consumers to ensure societal trust in production methods and for autonomous consumer choices. Moreover, our results show that stakeholders see FAW both as an intrinsic value and as a 'functional' value, while being relevant to achieve something else such as biodiversity or low AB use.

A brief reflection on the challenges of monetarisation of FAW

To understand the ethical value of FAW one needs to relate it both to other functional values such as biodiversity and low AB use, and to consider another type of values, the intrinsic value of human or animal lives which are often perceived as the underpinning rationale for all these values. Intrinsic values are however more difficult to transform into monetary terms than functional values, and it is widely discussed in the literature on environmental protection whether a transformation can at all cover what is alluded to with ethical values (Spangenberg and Settele, 2016) or if an entirely new system is needed (Gowdy *et al.*, 2010). Besides defining the criteria behind a correct 'currency' the question is whether these different value systems are at all comparable and commensurable, and not least, if the human psyche manages to handle two different systems 'collected' into one currency. Even though we saw signs of difficulties handling two different types of values in our focus groups, potentially supporting a new framework, a radical shift of housing systems would be difficult to achieve unless we ban animal farming for human purposes. That is, it would be well compatible with an animal rights' theory, but as soon as an animal exists or is used for human purposes (even if treated very well), there is an element of instrumentalisation which opens for pricing the process.

Whereas the practical elements of FAW are mirroring an effort well transformable to a price, the intrinsic value dimension of FAW refers to something absolute or untouchable, and per se difficult to estimate in monetary terms. It is therefore reasonable to expect a correspondence between the practical and the ethical welfare element, whereas the intrinsic value remains a given (but may still be understood in degrees). The higher the intrinsic value of the animal, the higher its welfare, and the higher monetary cost for its maintenance. If the reverse would apply, low FAW would not have a lower value than high welfare, which seems counter intuitive. Hence, such a total disconnection between human economy and the natural world (here farmed animals) might be both difficult and questionable as an end. While departing in human behaviour, the approach by Cornish *et al.* (2019) could possibly meet some of these claims and still accepting a transformation act. Moreover, this would mirror the general, stakeholder, views that FAW is important not only to the animals themselves, but to farmers and society at large and expected to be considered in policies, legislation and governmental subsidies. Here the most fundamental issue is whether the different parameters (functional and ethical values) are at all comparable, and hence if a cost-benefit approach holds for a solid decision-making process on ethical values in relation to monetary values.

Conclusions

It might be possible to convert practical dimensions of animal welfare values into monetary terms while still respecting the intrinsic values as inviolable. However, stakeholders emphasize different dimensions, which makes it necessary albeit difficult to decide which dimensions of animal welfare should be converted, and which functional values to include. Biodiversity and restrictions of AB use would be easier to include in e.g. a labelling scheme to manage a transformation from ethical to monetary values than autonomy and trust. Moreover, the ethical point of departure (that suffering should be avoided), and the responsibility of the decision-maker to listen to all stakeholders is crucial, being prepared to give the weaker party (the animal) the benefit of the doubt when it is unclear whether a decision (by farmers, consumer so politicians alike) risks affecting its welfare negatively.

References

- 2021/2633(RSP) Resolution on the European Citizens' Initiative 'End the cage age' Available at: https://www.europarl.europa.eu/doceo/document/TA-9-2021-0295_EN.html
- Albernaz-Gonçalves, R. *et al.* (2022). 'Linking Animal Welfare and Antibiotic Use in Pig Farming – A Review' *Animals* 12, no. 2: 216.
- Ahmed, H. *et al.* (2021). Assessing Animal Welfare and Farm Profitability in Cow-Calf Operations with Stochastic Partial Budgeting. *Animals* 11 (2): 382.
- Ahmed, H. *et al.* (2020) Assessing economic consequences of improved animal welfare in Swedish cattle fattening operations using a stochastic partial budgeting approach. *Livestock Science*, Vol 232.
- Cornish, A. *et al.* (2019). Applying the Behavioural Change Wheel to Encourage Higher Welfare Food Choices. *Animals* 9, 524.
- European Commission. Attitudes of Europeans towards Animal Welfare: 2016, Special Eurobarometer 442. Available at: http://data.europa.eu/euodp/en/data/dataset/S2096_84_4_442_ENG
- Gowdy, J. *et al.* (2010). What Every Conservation Biologist Should Know about Economic Theory. *Conservation Biology* 24, 1440-1447.
- Grunert, K.G. *et al.* (2014) Sustainability labels on food products: Consumer motivation, understanding and use. *Food Policy* 44, 177-189.
- Lundmark, F. (2017). Mind the Gaps. From Intentions to Practice in Animal Welfare Legislation and Private Standards. *Acta Universitatis agriculturae Sueciae*, 2016:95
- Lagerkvist, C.J., Hess, S. (2010). A meta-analysis of consumer willingness to pay for farm animal welfare. *Eur. Rev. Agric. Econ.* 38 (1), 55-78.
- Schjøll, A. *et al.* (2013). Consumer Preference for Animal Welfare when Buying Eggs. SIFO.

39. The institutional ethical review of animal research and the absence of ‘publics’

K. Salter

School of Sociology and Social Policy, University of Nottingham, Nottingham, United Kingdom;
kathleen.salter@nottingham.ac.uk

Abstract

The use of animals in scientific and medical research is a highly contentious historical issue fraught with many of the same social issues that pervade the governance of science in society more broadly. As with many morally complex areas of science and technology, policymaking has progressively been influenced by a multitude of stakeholders, including occupational groups (veterinary, animal technician) and animal welfare charities. However, the extent to which members of the ‘lay public’ are sufficiently incorporated into the regulatory context, as active stakeholders, remains the subject of ethical and political debate. The incorporation of ethical review bodies into regulatory systems was widely considered a positive step towards the achievement of a more socially accountable scientific endeavour. Though, as this paper seeks to demonstrate, a dynamic relationship between ‘publics’ and institutional ethical infrastructures, including the UK Animal Welfare and Ethical Review Body (or ‘AWERB’), remains effectively lacking. This paper introduces an ongoing research project that places these ideas at its core.

Keywords: animal ethics, AWERB, publics, ethics committees, animal research

Introduction: AWERBs, ethics, and ‘publics’

Regulating animal research represents a major challenge for contemporary democracies, where scientific research is increasingly held to a higher social and ethical standard. The uptake of this is often described as a move from ‘science *in* society, to science *for* society, and *with* society’ (Owen *et al.*, 2012:751). Animal research is understandably considered a fitting object for the impetus of greater social accountability as it is value-laden, morally problematic and heavily reliant on public/state funding, with ‘publics’ commonly framed as the key beneficiaries of the research outputs (Ormandy, 2012). Equally, in bioethics discourse, a subset of scholars have also sought to increase academic interest in the ‘Public Understanding of Ethics’ (or ‘public bioethics’) which explores how publics understand, relate to, and engage with the ‘ethics industry’ (Moore, 2010, Schicktanz *et al.*, 2012). This narrative contends there are good methodological and normative reasons for increased public engagement in ‘ethical review’ to increase the scope, legitimacy, and sustainability of ethical considerations made by scientific institutions.

For UK animal research regulation, the core piece of legislation is the *Animal (Scientific Procedures) Act*, 1986 (‘ASPA’). It was last amended in 2013 to conform to European Directive 2010/63 (although the directive itself drew heavily on the existing UK legislative model). Both hold as their normative element that the use of animals in research should be reduced where possible, but that the practice is ultimately justified under certain circumstances (Jørgensen *et al.*, 2021). The directive sets this as a standard for all of Europe. Home Office guidance on the operation of ASPA maintains that all academic and commercial organisations using, breeding, or supplying research animals, must have a functioning Animal Welfare and Ethical Review Body (or ‘AWERB’) (Home Office, 2014). The committee is required to meet regularly and advise staff on all issues related to the care and use of animals, to undertake an interim project license review, and operate according to each institutions’ local values (*Ibid.*). They are also

Section 4

widely considered a key point where ethics enters the process before formal licensing review, behind closed doors, by the Home Office (Davies, 2021).

Yet, interestingly, Rose (2012:283) details how at the inception of animal ethics committees, there was some trepidation about incorporating 'the ethical', with some stakeholders determining that their remit was better placed in the evaluation of 'welfare' issues only. Despite this, The Boyd Group (an independent think tank created to consider issues around animal testing) published a 2006 discussion paper on their proposed role, concluding that: their very existence 'would engender public confidence in decisions about the ethical acceptability of scientific work involving animals' (in Rose (2012:283)). The lasting salience of this assertion has not yet been explored in an academic or policymaking context, meaning we know very little about the evolved relationship between publics, AWERBs and institutional ethics systems more broadly.

It is the contention of this paper that available literature remains limited in two key areas:

1. There is a wider lack of *academic consideration* of the relationship between publics and the AWERB; and
2. There is a lack of *empirical work* around how publics understand and relate to animal ethics review.

This paper addresses the former gap, and introduces a series of planned focus groups that address the second. It does so by drawing on existing literature to identify current challenges to the successful incorporation of the public as active and dynamic stakeholders in current regulatory structures. It examines the following mechanisms designed to improve public accountability and demonstrates uncertainties in the actualisation of each case. This includes: (1) transparency initiatives, including Non-Technical Summaries (NTS); (2) the AWERB as a 'forum for discussion'; and (3) an exploration of AWERB's lay membership. It also introduces some preliminary findings of a document analysis undertaken as part of the wider project, which examined policy understandings of the legitimate *stake* of the public in the animal research debate.

Potential opportunities for public participation in ethical review—and critiques thereof

The publication of non-technical project summaries

The perception that 'publics' hold a legitimate stake in the UK animal research debate has, ostensibly, been systemically validated through an industry-wide pledge towards improved 'transparency' driven by the 2014 launch of the Concordat for Openness. The Concordat welcomed engagement from a broad range of organisations in the sector and represented a commitment to actively maintaining the relationship between society and the practice of animal research. Transparency in the industry was (and still is) said to be greatly hindered by Section 24 of ASPA (the 'confidentiality clause'). Essentially, S.24 makes it a criminal offence to disclose details of an establishment or a researcher conducting animal research (including project license applications and Home Office inspection reports). This is said to both protect intellectual/commercial property rights, and to protect the safety of researchers from a perceived risk of animal rights activism (Home Office, 2014). This clause remains in place today despite calls from stakeholders that it inhibits public debate and wider scrutiny of animal research (Dunn, 2021). This means that in practice, public involvement with the animal research regulation process is limited. Researchers are, however, required to produce an anonymised 'non-technical project summary' (NTS) of the proposed research. This is the only *mandated* release of information to publics, where they are published on the Home office website *if* project license applications are successful (often passing through the AWERB first).

However, some recent dialogue on their efficiency in the UK (and more widely in Europe) suggest they are often of poor quality, use inappropriately technical or vague language, and are read by few members of the 'lay public' (Taylor *et al.*, 2018). They are also often published too long after the project license application (sometimes years), meaning there is no room for 'informed public debate and accountability of regulators' decisions' (*Ibid.*: 205). Although, there has been an observable recent drive for improvement (ASC and AWERB Hubs, 2022). Subsequently, it is clear that the NTS functions as a 'one-way' communication channel. This is partly a result of the cautiousness evoked by S.24 (the 'confidentiality clause'), but also evident in an observable assumption in policy and guidance that NTS' can directly foster 'public trust' through increased openness. Such language indicates that interactions with the public via the NTS are still widely understood by stakeholders as opportunities to improve scientific literacy and public support, rather than for mutual engagement opportunities (see:McGlacken and Hobson- West, 2022).

Ethical discussion within the AWERB

'Ethics,' both within the AWERB and throughout the regulatory context, is rooted in the principles of the '3Rs' (replacement, reduction, refinement in/of the use of animal models) (Russell and Burch, 1959), and the pursuit of a *positive* Harm-Benefit Analysis (HBA). The HBA must demonstrate that the 'potential benefits of the project for people, animals or the environment' outweigh the 'likely adverse effects' (Home Office, 2014:6). As explored above, the very presence of local ethical review was anticipated to encourage public trust in the system. Yet, the suitability of these ethical infrastructures has received some critique since their establishment, with many commenting that they can often limit the scope of ethical discussion (McLeod and Hartley, 2018, DeGrazia and Beauchamp, 2019, Grimm *et al.*, 2019). Such assessments generally suggest that they result in the prioritisation of physical suffering measurable in an animal model, thus encapsulating a narrow conception of relevant wider societal/cultural concerns and of 'animal welfare'. Job (2014:310), undertook a qualitative study of lay members in UK Ethical Review Process (the predecessor of AWERBs), and concluded that the process risks becoming increasingly standardised or detached from wider considerations of 'the ethical' through bureaucratisation. Others note a predominantly technical framing of ethics which disregards a multitude of ethical considerations, namely those of wider society (Tjörnström *et al.*, 2018, Raman *et al.*, 2017).

Consequently, the 'doing' of ethics in the AWERB is sometimes said to prioritise 'methodological improvements of the experiment' while 'complex ethical questions about research purposes and animal suffering' are unspoken, unnoticed or pushed to the back of the agenda (Poort *et al.*, 2013:6). However, more recent reflections from workshops with AWERB members suggest that many AWERB members showed a *desire* to engage more comprehensively with questions of 'the ethical', but noted a lack of time, resources and ethical training available to do so (Hawkins and Hobson-West, January, 2017). Failing to engage with the more 'tricky' ethical issues in ethical review represents a missed opportunity to incorporate the qualitative non-technical views of publics' into organisational ethical structures.

Lay membership within the AWERB

While ASPA itself does not officially mandate lay membership to the AWERB, their appointment has become widely accepted to be good practice (Jennings and Smith, 2015). The inclusion of lay members in regulatory contexts more broadly has gained scrutiny over recent years in terms of what exactly lay 'expertise' is and how should it be mobilised (Grundmann, 2017). Job (2014) specifically investigates what it *means* to be a lay member in the animal research ethical review body. She notes a complex negotiation of identity in terms of their 'externality' to both the discipline of science and the institution, while trying to maintain their expertise to be considered 'educated, rational, objective and reasonable' enough to make their position 'count' (2014:290). She also noted a recruitment bias towards scientists

Section 4

and ethicists who possibly employ their professional experiences in discussions, rather than necessarily mobilising their 'layness' (2014:202). However, AWERB chairs have identified a recurrent difficulty in recruiting lay members willing to take on and retain such roles, perhaps explaining why this 'bias' emerges in practice (Jennings and Smith, 2016). Policy and guidance surrounding the AWERB does, however, seem to suggest that while lay members are tasked with holding an 'awareness' of wider societal concerns, they are not, at any point, expected to be *accountable* to/for lay publics. Therefore, while important in invigorating and widening discussion, it cannot be claimed that they necessarily represent 'the public' in ethical review. This endeavour would likely require an entirely different institutional structure altogether.

Future research directions

Overall, this paper, through an examination of existing academic literature (as well as grey policy literature), has sought to demonstrate that within the current regulatory context, while publics' 'trust' in the system is deemed essential, their active deliberation as stakeholders is currently absent from the ethical structures around animal research governance.

This assertion has been strengthened further through the outputs of an ongoing PhD project at the University of Nottingham, which began with a document analysis of key policy and guidance documents advising on the operation of UK AWERBs. This centred around what the imagined public involvement in the 'successful' ethical review process was projected to be. A preliminary finding of this phase explores the imagined *stake* of the public in the animal research debate. It was found that while publics' are routinely positioned as the key benefactors of animal research outputs, less emphasis is placed on their democratic stake in how science is governed. For example, the most common reference to 'publics' lies in their capacity as future patients/research participants. Therefore, ethical review is positioned to take place with eventual clinical applications of research in mind. This is of interest for two key reasons: (1) it prioritises the imagined role of publics in animal research as *consumers* of its outputs, rather than as active and engaged *citizens* (with social and cultural stakes in how animal research is performed). (2) it eliminates the ambivalences in the position/perception of publics who may consume the outputs of animal research but still have serious concerns about its use and regulation (see: McGlacken, 2021, McGlacken and Hobson- West, 2022). The implications of this distinction have very real repercussions for how transparent and open to societal influence this process should legitimately be, and to what extent decisions can be made on behalf of publics'. For example, as Daging and Johnson (2015:2) have noted on the topic of animal agriculture systems in multi-national liberal democratic states, in general, imagined democratic 'citizens' can be seen to utilise their 'legitimised' interests by 'agitating for direct action to change how animals are used through political processes'. While imagined 'consumers' (as publics are positioned here) are most legitimately seen to seek to 'influence standards through their activities in the marketplace', when seeking to 'satisfy their individual value preferences' (*Ibid.* 2015:2). This becomes further complicated in the case of animal research for scientific and medical reasons as publics do not see themselves to have a choice over their consumption of medicine or healthcare (McGlacken, 2021). Yet, publics as 'consumers' are considered an audience to science, and therefore their rightful 'place' in ethical review is on the periphery. Whereas, if they are to be recognised as legitimate stakeholder citizens, their presence throughout the regulatory process is more overtly essential. There is, of course, great diversity in institutions that use animal research, and therefore great difference *between* different AWERBs in practice (ASC and AWERB Hubs, 2020), meaning generalisation here is difficult. However, the key question for maintaining the 'social contract' that animal research is reliant (Davies *et al.*, 2016) remains: is this current general absence of publics socially legitimate, and more broadly, what is social legitimacy and what is the process of legitimisation?

Accordingly, the second phase of research will involve a series of online focus groups with lay publics. These discussions will centre around collective/common values, visions and associated feelings around

the 'ethical' or 'desirable' future of scientific practice involving animal models. This research is expected to produce valuable reflections on how to achieve and maintain socially acceptable animal research policy and practice, and to inform discourse around how publics engage with institutional (animal) ethical review more widely.

Acknowledgements

With many thanks to my primary supervisor, Professor Pru Hobson-West, University of Nottingham UK, and to the EURSAFE review team for their extensive comments on this paper. This work was supported by the Economic and Social Research Council [Grant number: ES/P000711/1].

References

- ASC & Awerb Hubs 2020. Animals in Science Committee and Animal Welfare and Ethical Review Body hub chairs workshop report. Home Office.
- ASC & Awerb Hubs 2022. Animals in Science Committee and Animal Welfare and Ethical Review Body hub chairs workshop report. Home Office.
- Dageling, C. J. and Johnson, J. 2015. Citizens, Consumers and Animals: What Role do Experts Assign to Public Values in Establishing Animal Welfare Standards? *Journal of Agricultural and Environmental Ethics*, 28: 961-976.
- Davies, G. 2021. Locating the 'Culture Wars' in Laboratory Animal Research: National Constitutions and Global Competition. *Studies in History and Philosophy of Science*, 89, 177-187.
- Davies, G.F., Greenhough, B.J., Hobson-West, P. and Al., E. 2016. Developing a collaborative agenda for humanities and social scientific research on laboratory animal science and welfare. *PLOS ONE*, 7, 19.
- Degrazia, D. and Beauchamp, T.L. 2019. Beyond the 3Rs to a More Comprehensive Framework of Principles for Animal Research Ethics. *ILAR Journal*, 0, 1-10.
- Dunn, R. 2021. Brexit: A Boon or a Curse for Animals Used in Scientific Procedures? *Animals*, 11, 1-21.
- Grimm, H., Olsson, I.A.S. and Sandøe, P. 2019. Harm-benefit analysis – what is the added value? A review of alternative strategies for weighing harms and benefits as part of the assessment of animal research. *Laboratory Animals*, 53, 17-27.
- Grundmann, R. 2017. The Problem of Expertise in Knowledge Societies. *Minerva*, 55, 25-48.
- Hawkins, P. and Hobson-West, P. January, 2017. Delivering Effective Ethical Review: The AWERB as a 'Forum for Discussion'.
- Home Office 2014. Guidance on the Operation of the Animals (Scientific Procedures) Act 1986, London, Home Office.
- Jennings, M. and Smith, J. Awerb Uk Workshop on the Role of Lay and Independent Members in AWERBs. AWERB UK: Delivering an Effective AWERB – Challenges and Solutions, 12 May 2016 London. AWERB UK (RSPCA, LASA, LAVA, IAT).
- Jennings, M. and Smith, J.A. 2015. A Resource Book for Lay Members of Ethical Review and Similar Bodies Worldwide. RSPCA.
- Job, K. 2014. Local Ethical Review in the Regulation of Animal Experimentation: Constructing Ethical Science. University of Nottingham.
- Jørgensen, S., Lindsjö, J., Weber, E.M. and Röcklinsberg, H. 2021. Reviewing the Review: A Pilot Study of the Ethical Review Process of Animal Research in Sweden. *Animals*, 11, 1-28.
- Mcglacken, R. 2021. (Not) Knowing and (Not) Caring About Animal Research: An Analysis of Writing from the Mass Observation Project. *Science & Technology Studies*, 0: 1-19.
- Mcglacken, R. and Hobson-West, P. 2022. Critiquing Imaginaries of 'The Public' in UK Dialogue Around Animal Research: Insights from the Mass Observation Project. *Studies in History and Philosophy of Science*, 91, 280-287.
- McLeod, C. and Hartley, S. 2018. Responsibility and Laboratory Animal Research Governance. *Science, Technology & Human Values*, 43: 723-741.
- Moore, A. 2010. Public Bioethics and Public Engagement: The Politics of 'Proper Talk'. *Public Understanding of Science*, 19, 197-211.

Section 4

- Ormandy, E.H. 2012. The Importance of Involving the Public as Stakeholders when Developing Animal Welfare Policy. *Altex*, 1: 255-257.
- Owen, R., Macnaghten, P. and Stilgoe, J. 2012. Responsible Research and Innovation: From Science in Society to Science for Society, with Society. *Science and Public Policy*, 39, 751-760.
- Poort, L., Holmberg, T. and Ideland, M. 2013. Bringing in the Controversy: Re-politicising the De-politicised Strategy of Ethics Committees. *Life Sciences, Society and Policy*, 9: 1-13.
- Raman, S., Hobson-West, P., Lam, M.E. and Millar, K. 2017. 14 Science Matters and the Public Interest: The Role of Minority Engagement. In: Nerlich, B., Hartley, S., Raman, S. and Smith, A. (eds.) *Science and the Politics of Openness: here be monsters*. Manchester: Manchester University Press.
- Rose, M. A. 2012. Ethical Review of the Use of Animals in Research: A Reflection on the Journey. *ALTEX*, 1, 281-288.
- RSPCA and LASA 2020. *Guiding Principles to Help Deliver the Ethics Learning Outcomes of Module 2 Training for Personal Licensees*.
- Russell, W.M.S. and Burch, R. 1959. *The Principles of Humane Experimental Technique*, London, UK, Methuen.
- Schickanz, S., Schweda, M. and Wynne, B. 2012. The Ethics of 'Public Understanding of Ethics' – Why and How Bioethics Expertise Should Include Public and Patients' Voices. *Medicine, Health Care and Philosophy*, 15, 129-139.
- Taylor, K., Rigo, L. and Weber, T. 2018. Recommendations to Improve the EU Non-Technical Summaries of Animal Experiments. *ALTEX*, 35, 193-210.
- Tjärnström, E., Weber, E.M., Hultgren, J. and Röcklinsberg, H. 2018. 'Emotions and Ethical Decision-Making in Animal Ethics Committees'. *animals*, 10, 181-200.

Section 5.

People and animals

40. Worldviews, values and perspectives towards the future of the livestock sector

K.J. Blair* and D. Moran

University of Edinburgh, Global Academy of Agriculture and Food Security, The Royal (Dick) School of Veterinary Studies and The Roslin Institute, Easter Bush Campus, EH25 9RG, United Kingdom; kirsty.blair@ed.ac.uk

Abstract

The livestock sector is under increasing scrutiny due to numerous sustainability challenges related to both the production and consumption of livestock products. However, political and market barriers and conflicting worldviews and values across the environmental, socio-economic and political domains have led to considerable sector inertia. This paper presents results of a mixed methods approach, combining survey and interview data, to explore the influence of environmental worldviews, values and demographic factors on perspectives towards the future of the livestock sector. Based on a sample of livestock representatives (n=307) we find that respondents with higher pro-environmental and ecocentric worldviews and values favour more behaviour-oriented and artificial meat solutions. Those with lower pro-environmental and higher techno-centric worldviews and values favour technological solutions to improve the efficiency of production and enable continued patterns of meat consumption. Demographic variation and qualitative data emphasise the need to recognise cultural and geographic nuance in narratives. The results of this study improve our understanding of the processes that lead to the formulation of perspectives, enabling the development of more holistic solutions that acknowledge all voices in an increasingly polarised debate. Adopting more pluralistic, relational methodologies will therefore be paramount in developing solutions for sustainable livestock futures.

Keywords: sustainability, livestock systems, worldview and value systems

Introduction

The livestock sector is under increasing scrutiny due to numerous sustainability challenges related to both the production and consumption of livestock products. Consumption of meat is expected to increase by 75-145% by 2050 (Godfray *et al.*, 2018), with a large proportion of the increase expected in developing countries as a result of population rise, increasing affluence and shifts in dietary preference. However, developed countries currently consume significantly higher proportion of meat per capita (OECD, 2021). The uneven distribution and consumption of animal source foods is problematic. Nearly 800 million people do not have access to animal source foods, leading to micronutrient deficiencies (Adesogan *et al.*, 2020). Meanwhile, overconsumption of red and processed meat in developed countries has resulted in increased rates of obesity and non-communicable diseases (Wellesley *et al.*, 2015). Food security in developing countries is also being threatened by land use change with increased demand for animal feed (Makkar, 2018).

In terms of the environmental impact, the livestock sector accounts for around 14.5% of all human-induced greenhouse gas emissions (GHGs) (FAO, 2013). The production of meat is responsible for large-scale deforestation and is extremely resource-intensive in terms of land, water and energy use. Nitrogen run-off from fertilisers used in feed production and from slurry can also be problematic for aquatic ecosystems.

Section 5

Several international and UK-based inquiries have called for a reduction of meat consumption in developed countries. However, despite clear recommendations, institutional and biological complexity, policy inaction, a lack of communication and an overreliance on the market have led to a cycle of sector inertia (Wellesley *et al.*, 2015; Garnett *et al.*, 2015). Industry lobbyists have also been accused of trying to ‘confuse and delay regulation’ (Dunne, 2021). As with other sustainability challenges, the livestock sector is subject to a battlefield of worldview and value conflicts across the environmental, socio-economic and political domains (Chuang *et al.*, 2020). There is therefore an urgent need to investigate how worldviews and values shape sector representative’s perspectives towards the future of the livestock sector. Understanding this relationship will shed light on the reasons for inertia. This paper presents results of a mixed methods study, combining survey and interview data, to explore the influence of environmental worldviews, values and demographic factors on perspectives towards the future of the livestock sector.

Methodology

Survey design and analysis

The survey was targeted at livestock sector representatives, including researchers, students, veterinarians, farmers, producers, processors and others. This was to ensure that there was a broad representation of perspectives and to determine how perspectives differ across the sector. The survey contained five sections. Sections one to three explored participant reactions towards problem statements, scenarios and policy implications. The problem statements included: ‘not enough food’, ‘too much greed’ and ‘too much inequality’, with full descriptions given in the survey. Scenarios included: ‘continued meat consumption’, ‘artificial meat takes over’, ‘small scale, local production’, ‘meat reduction’, again with full descriptions provided. The 12 policy implication statements reflected the four scenarios – three for each. Sections one and three asked participants to respond to the statements on a five-point Likert scale from strongly disagree to strongly agree. The sum of the policy statements was calculated for each scenario. Section two asked participants to select the scenario they would most like/expect to see by 2035. Problem statements, future scenarios and policy statements were developed based on Garnett (2015).

The fourth section explored participant’s environmental worldviews and values utilising the 15-item revised New Ecological Paradigm scale (NEP) scale (Dunlap *et al.*, 2000) and seven statements for relational values adapted from Chan *et al.* (2016). Participants responded to the statements on a five-point Likert scale, and the sum of the responses was calculated. The NEP measures perspectives towards the reality of limits to growth, anti-anthropocentrism, the fragility of nature’s balance, rejection of exemptionalism and possibility of an eco-crisis (Dunlap *et al.*, 2000). This study divides the NEP statements into 1. technocentrism, representing more ‘techno-fix’ mentalities; 2. ecocentrism, representing more concern over the impact of humans on the environment; and 3. dualcentrism, representing the ‘symbiotic duality’ of humans and the environment (*cf.* Thapa, 1999, p.432), calculating scores for each. The relational values statements measure perspectives towards stewardship eudaimonic, stewardship principle/virtue, moral responsibility to non-humans, social responsibility, social cohesion, individual identity and cultural identity (Chan *et al.*, 2016).

Section five explored participant demographics, including occupation, disciplinary background (for researchers), years in the sector, livestock sector(s) represented, country, gender and age. Participants were also asked whether they would be willing to participate in a follow-up interview. At various points throughout the survey respondents were given the opportunity to leave qualitative feedback.

Before circulation, the survey was piloted and questions refined. The final survey was administered online via Qualtrics XM platform and data collected from 17th June to 7th July 2021. To incentivise

response, £200 worth of gift cards were offered in prize draws. Participants were recruited via a variety of means, including email, social media and forums. In total, 161 diverse organisations, networks and interest groups were contacted.

The number of complete survey responses was 307 with impressive demographic spread (see results). This well exceeded the minimum sample size of 109 and power required for multivariate ordinary least squares regression as calculated by G*Power Version 3.1.9.7 (effect size $f^2=0.15$, α err prob= 0.05, power = 0.8 and number of predictors = 8). Statistical analysis was conducted via Stata/SE 16.1. A series of multivariate ordinary least squares regressions were conducted to test the following models: 1. the effect of NEP on the level of agreeance with each problem/scenario; 2. the effect when controlling for relational values; and 3. the effect when controlling for relational values, gender, age, years in sector and occupation. The model that explained the highest percentage of variation was retained. In most cases this was model three. However, for 'small scale, local production', model two explained the highest percentage of variation. NEP items were also divided into scores for technocentrism, ecocentrism and dualcentrism to determine whether they resulted in significant variation in level of agreeance with each problem/scenario. The hypotheses are:

H₀: There is no significant variation between environmental values and how much participants agree with each problem/scenario.

H_a: There is significant variation between environmental values and how much participants agree with each problem/scenario.

Interviews and qualitative data analysis

The interviews, which ranged from 29-49 minutes, were conducted on Microsoft Teams, recorded and transcribed. Overall, ten participants were interviewed. Participants were systematically selected to represent a diversity of environmental worldviews, values, occupations, locations and other demographics. Interview protocols were designed to encourage reflection on the survey and the following themes: what is the problem in current livestock systems; future scenarios; research and policy priorities; influencing factors towards perspectives; and final remarks. Qualitative data was analysed using NVivo 12. Thematic codes were applied following a grounded theory approach to produce a posteriori codes, i.e. developing theory from the data in an iterative/recursive process of data collection/analysis.

Results and discussion

Overall, there were 307 complete survey responses with a good spread of representatives across gender (52.4% female, 44.3% male, 0.3% non-binary/third gender), age (7.8% 18-24, 28.3% 25-34, 21.8% 35-44, 17.9% 45-54, 15.0% 55-64, 6.5% 65-74, 0.3% 75-84, 0% 85+ and 2.3% prefer not to say), occupation (25.7% farmers, 25.1% researchers, 15.3% veterinarians, 10.8% postgraduate students, 3.6% undergraduate students, 1.0% producers, 1.0% processors and 17.6% other) and livestock sector (23.7% beef, 23.3% sheep, 15.8% dairy, 6.4% poultry, 7.9% other and 22.9% not sector specific). The majority (68.4%) of respondents were from the UK, but a total of 31 countries were represented. However, this study does not seek to be representative of each country, or find associations based on geographic location. Instead, the aim is to determine whether there is a relationship between environmental worldviews, values and demographic factors in influencing individual's perspectives towards the future of the livestock sector.

Section 5

The results demonstrate the importance of environmental worldviews, values and demographic factors in influencing individual's perspectives towards the future of the livestock sector. Results from the multivariate ordinary least squares regression tests demonstrate significant variation between NEP and how much participants agree with each problem/scenario when controlling for relational values, gender, age, years in sector and occupation so we can reject the H_0 . Some of the control factors also have a significant effect (Figure 1 and 2). Statistical significance is indicated by *, **, *** at $\alpha < 0.1$, $\alpha < 0.05$ and $\alpha < 0.01$ levels respectively. The models are able to explain between 4.4% and 33.5% of variation (R^2 values). R^2 values below 50% are very common in trying to predict human behaviour, and we are still able to draw important conclusions from the statistically significant predictors.

Those with higher pro-environmental and ecocentric worldviews and values were significantly more likely to consider the problem being that there is too much inequality and greed in current systems, favouring more behaviour-oriented and artificial meat solutions. In contrast, those with lower pro-environmental and higher technocentric worldviews and values were more likely to think that there is not enough food in current systems, that we can continue to increase global meat consumption and instead invest in technological solutions to improve efficiency of meat production. Overall, the role of environmental worldviews/values in influencing livestock future perspectives is not surprising given that ecocentric perspectives emphasise equitable redistribution of resources and environmental protection, and technocentric perspectives emphasise systemic continuity and scientific/technological solutions to environmental challenges (Dryzek, 2013). It was also interesting to see the importance of demographic factors in influencing perspectives, including age, gender, occupation and years in the sector. For example, farmers tended to be less likely to agree with all three problem statements and be more opposed to meat-excluding scenario policies. Those with fewer years in the sector, females and those who were younger also tended to agree more with the too much greed and inequality problem statements. Furthermore, males and younger people were more likely to support policies that enable continued meat consumption.

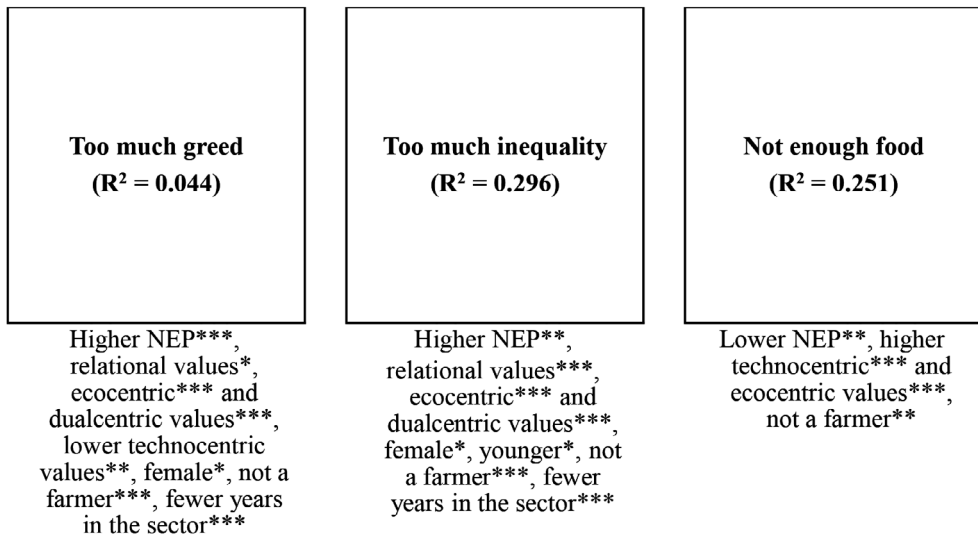


Figure 1. Effect of NEP/control variables on level of agreement with the problem statements.

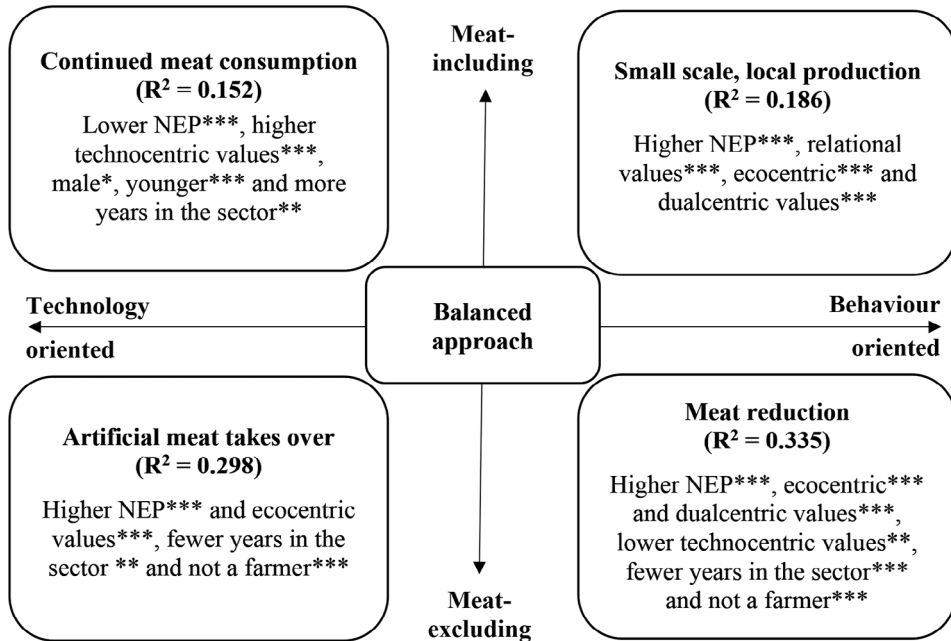


Figure 2. Effect of NEP/control variables on level of agreement with the scenarios.

The survey also revealed that some of the more popular policy measures included nutritional/environmental education, self-sufficiency within countries and learning from traditional, indigenous and local knowledge. Whereas the least popular policy measures included investing in cell-cultured meat and government intervention through taxes/incentives. Qualitative data uncovered differing research and policy priorities, including animal welfare/health, public health, the environment and trade deals. Qualitative feedback also emphasised the need to recognise a spectrum of perspectives rather than four distinct scenarios and to recognise the importance of cultural and geographic variation/nuance.

Conclusions

This study has explored the role of environmental worldviews, values and demographic factors in influencing perspectives towards the future of the livestock sector, with striking results and notable implications for the future of policy. Environmental worldviews and values have been shown to be important in influencing perspectives. Those with higher pro-environmental and ecocentric worldviews and values are more likely to consider the problem being too much inequality and greed in current systems, favouring more behaviour-oriented and artificial meat solutions. In contrast, those with lower pro-environmental and higher technocentric worldviews and values are more likely to think that there is not enough food in current systems, that we should continue to increase global meat consumption and invest in technological solutions to improve efficiency of meat production. It was also interesting to see the importance of demographic factors in influencing perspectives, including age, gender, occupation and years in the sector. The intention of this study was not to make judgement over the best scenario, but instead to improve understanding of the processes that lead to the formulation of perspectives to enable development of more holistic solutions that acknowledge all voices in an increasingly polarised

Section 5

debate. Adopting more pluralistic, relational methodologies will therefore be paramount in developing solutions for sustainable livestock futures.

Acknowledgements

KB acknowledges UKRI support under grant ES/P000681/1.

DM acknowledges UKRI support under grant numbers BB/T004436/1, ES/S000186/1 and ES/S0008/1.

References

- Adesogan, A.T., Havelaar, A.H., McKune, S.L., Eilittä, M. and Dahl, G.E. (2020). Animal source foods: sustainability problem or malnutrition and sustainability solution? Perspective matters. *Global Food Security*, 25: 100325.
- Allen, M. (2015). Short-Lived Promise? The science and policy of cumulative and short-lived climate pollutants. Oxford Martin Policy Paper. Available at: https://www.oxfordmartin.ox.ac.uk/downloads/briefings/Short_Lived_Promise.pdf. Accessed 3 March 2022.
- Chan, K.M., Balvanera, P., Benessaiah, K., Chapman, M., Díaz, S., Gómez-Baggethun, E., Gould, R., Hannahs, N., Jax, K., Klain, S. and Luck, G.W. (2016). Opinion: why protect nature? Rethinking values and the environment. *Proceedings of the national academy of sciences*, 113(6): 1462-1465.
- Chuang, F., Manley, E. and Petersen, A. (2020). The role of worldviews in the governance of sustainable mobility. *Proceedings of the National Academy of Sciences*, 117(8): 4034-4042.
- Dryzek, J.S. (2013). *The politics of the earth: environmental discourses*. Oxford university press, Oxford, UK, 220 pp.
- Dunlap, R.E.V.L., Liere, K.V., Mertig, A. and Jones, R.E. (2000). Measuring endorsement of the new ecological paradigm: a revised NEP scale. *Journal of social issues*, 56(3): 425-442.
- Dunne, D. (2021). Global meat industry 'using tobacco company tactics' to downplay role in driving climate crisis, investigation claims. *The Independent*. Available at: <https://www.independent.co.uk/climate-change/news/meat-dairy-industry-greenwashing-climate-b1884769.html>. Accessed 3 March 2022.
- FAO (Food and Agriculture Organization of the United Nations). (2013). *Tackling climate change through livestock – a global assessment of emissions and mitigation opportunities*. FAO, Rome, Italy, 139 pp.
- Garnett, T. (2015). Gut feelings and possible tomorrows: (where) does animal farming fit. *Food Climate Research Network, Environmental Change Institute, University of Oxford, Oxford, UK*, 28 pp.
- Godfray, H.C.J., Aveyard, P., Garnett, T., Hall, J.W., Key, T.J., Lorimer, J., Pierrehumbert, R.T., Scarborough, P., Springmann, M. and Jebb, S.A. (2018). Meat consumption, health, and the environment. *Science*, 361: 6399.
- Makkar, H.P.S. (2018). Feed demand landscape and implications of food-not feed strategy for food security and climate change. *Animal*, 12(8): 1744-1754.
- OECD (Organisation for Economic Co-operation and Development). (2021). *OECD-FAO Agricultural Outlook. Meats – 1992-2028*. [Online]. [Accessed 4 August 2021]. Available from: <https://stats.oecd.org/index.aspx?queryid=76854> accessed 2021.
- Thapa, B. (1999). Environmentalism: the relation of environmental attitudes and environmentally responsible behaviors among undergraduate students. *Bulletin of Science, Technology & Society*, 19(5): 432-444.
- Wellesley, L., Froggatt, A. and Happer, C. (2015). *Changing climate, changing diets: Pathways to lower meat consumption*. Chatham House, the Royal Institute of International Affairs, London, UK, 76 pp.

41. Flying bamboo across the globe and invisible animals: tales of feeding animals in zoos

S. Brando*, P. Rachinas-Lopes and M. Norman

AnimalConcepts, P.O. Box 378, 03725 Teulada, Alicante, Spain; sbrando@animalconcepts.eu

Abstract

Contemporary zoos, aquariums, other facilities housing animals in human care (hereafter zoos) are concerned with their core values of animal wellbeing, education, and conservation. There is a wide variety of species living in zoos worldwide, spanning across many different taxa, with an enormous diversity of diets bringing its own set of challenges. While some organisations fly fresh bamboo around the world to satisfy the nutritional needs of the giant and red pandas, others grow different varieties on location; meat sourced locally from higher welfare farms, or through intensive farming systems with mainly ‘invisible’ animals; fish sourced from through environmental damaging fishing practices, or through certified fisheries stewardship arrangements. The enormous quantities of waste and greenhouse gasses produced from animals, how food is produced and transported, negative impacts on freshwater resources, species decline through overfishing, destruction of habitats due to deforestation, and the impacts on the wellbeing of individuals used as food for others warrants a closer investigation on how food is sourced in zoos. With animal wellbeing, species, and nature conservation as their missions, organisations housing animals must align their practices to reflect care and respect for all animals, peoples, the greater community of life and planetary wellbeing.

Keywords: animal wellbeing, sustainability, conservation, zoos, nutrition, food

Introduction

The World Association of Zoos and Aquariums states, ‘biodiversity conservation without action for sustainability is incomplete’ (WAZA, 2005), and ‘zoos and aquariums have a responsibility to achieve high standards of animal welfare’ (WAZA, 2015), highlighting the importance of attention to animal wellbeing, conservation, and sustainability. Zoos and aquariums housing animals in human care (hereafter zoos) have developed animal welfare programs, focusing on positive psychological wellbeing 24/7 across lifespan (Brando and Buchanan-Smith, 2018) and increasingly turned their attention to operating in a sustainable manner (Hanson and Holt, 2014). Many zoo education programs cover protecting biodiversity, yet not all zoos have made consistent and continuous decisions to source their animal feed from organic and eco-friendly sources (Schram, 2008). It is estimated that around 70 billion animals are slaughtered every year worldwide (Faunalytics, 2020) including chickens, cows, pigs, sheep, and fishes (measured in tons live weight). Farm animals are bred in intensive farming systems, shipped alive around the world, are trucked between countries over great distances, or caught by super trawlers processing 250 tonnes of fish a day, invisible to most people. While advances have been made for farm animals (Fernandes *et al.*, 2021), aquatic animals (Toni *et al.*, 2019; Browman *et al.*, 2019), and invertebrates (Van Huis, 2019; Carere and Mather, 2019) who are consumed as food, many or parts of the process still pose severe welfare concerns. Despite the evident links between the food supply chain and biodiversity loss, attention towards sustainability in how zoos feed people and other animals has thus far been limited (Hanson and Holt, 2014; Gjerris *et al.*, 2016). Zoos are responsible for the procurement of a wide variety of food types and consumers including thousands of animal species (Nijboer, 2020) as well as staff and visitors (Brando and Harfeld, 2014; Hanson and Holt, 2014). While the human food supply chain in zoos has undergone strides towards more sustainable sourcing (Hanson and Holt, 2014),

Section 5

progression towards feeding the non-human residents of the zoo ethically and sustainably has not been as transparent or given the same level of attention. This review will, firstly, examine the challenges that zoos face to more environmentally-conscious and animal wellbeing decisions regarding the sourcing of food for people and animals, to be followed by highlighting the efforts to mitigate these challenges. We will then identify ways forward and suggestions for the future, and how the global zoo community can take steps to start 'walking the talk' (Schram, 2008) regarding creating more sustainable animal nutrition programmes that align with their core values of animal wellbeing, education, species conservation, and the preservation of habitats.

The challenges zoos face in feeding sustainably and ethically

While there are many other tensions related to food provisions in zoos e.g. breeding feeder animals, or feeding surplus animals to other animals in the zoo, this paper focuses mainly sustainability and the wellbeing of externally farmed animals used for food. Reviewing and evaluating new nutrition programmes to reduce their environmental impact is not yet commonplace (Schram, 2008) and is challenging when the nutritional and behavioural needs of animal diets must be met (Brando and Buchanan-Smith, 2018). The switch to organic, high welfare, and environmentally-conscious food often increases costs which is not always viable within zoos' limited budgets. A survey of sustainable food procurement identified placing a higher priority on nutritional quality and economic sustainability than environmental and social issues (Hanson and Holt, 2014). The wellbeing of animals used as food is often disregarded (Brando and Harfeld, 2014), in providing meat that nutritious and allows for natural behaviour of carnivores, the very same organisations are not always regarding the welfare of the 'invisible' animals used to supply that same meat. The sourcing of former-rainforest products, including certain fruits, to feed animals that in the wild are threatened by the same practices. Some of the difficulties in sustainably sourcing food for animals originate from the sheer breadth of diets (Schram, 2008) and providing the correct balance of nutrients to zoo animals can be difficult (Nijboer, 2020). Commercially produced animal feed e.g. meals and pellets, often contains soy and palm oil (Wensing and Nijboer, 2010) and lack many of the opportunities that are associated with the behavioural and social feeding-related repertoires. There are ethical sources of former rainforest products; yet, while there are opportunities to influence feed suppliers – particularly those that specialise in zoo animal nutrition – overall zoos have a small market share. As such, they have less market power to influence feed manufacturers than livestock producers – where it takes approximately 10 kg of soy to produce 1 kg of meat (Wensing and Nijboer, 2010). In 2019, 3.8 million hectares of mature rainforests, humid tropical primary forest, that are especially important for biodiversity and carbon storage were lost according to data on Global Forest Watch, with large scale cattle ranching and soy production being major drivers of deforestation (Weisse and Goldman, 2020). Very specialist diets create an additional challenge. The giant panda, which can consume around 20 kg of bamboo in a day. While zoos in some regions can produce their own food on-site, others must ship from overseas to meet the animal's nutrition demands. Canada's Calgary Zoo took the decision to return its own pandas to China due to a lack of flights in the COVID-19 pandemic making it difficult to ensure a consistent supply. The food miles generated through the import of such specialist diets calls into question the sustainability of such feeding practices, and indeed in housing such animals in regions where food cannot be locally procured.

Possible progress towards ethical zoo nutrition

There are various examples of zoos reviewing their nutrition practices, enforcing more sustainable, environmentally, and welfare-conscious practices. We identify three areas where there have been such developments: fish and seafood, fruit, vegetables and browse, and meat.

Fish and seafood products

Numerous institutions have proved that it is possible to supply large enough quantities while still procuring seafood from environmentally sustainable sources, despite the challenges highlighted by Hill (2008). In 2007, the Zoological Society of London (ZSL) undertook an audit of its seafood use across both its London and Whipsnade Zoo sites, also included within animal feed practices. ZSL identified that most seafood was sourced from small fisheries lacking in data and steps were taken to develop a risk assessment of the sustainability issues presented on a case-by-case basis (Koldewey *et al.*, 2009). Through such assessments, zoos can make decisions that ensure their piscivorous species are fed ethically and sustainably. Edinburgh Zoo's sea lions and penguins, for example, are fed from MSC-certified fish stocks; Living Coasts, a now-closed former UK seabird facility, sourced primarily local and in-season fish species for their penguins, seals, puffins, auks, and other piscivorous species (Koldewey *et al.*, 2009). Hull (2008) further noted that, where fish were procured from environmentally-conscious sources but were not nutritionally appropriate for the species, commercial supplements were a viable consideration to enhance the nutrient profile without resorting to less sustainable sources.

Fruits, vegetables and browse

Fruit and vegetable procurement is another key area, particularly as these food groups tend to form the bulk of feed imports within zoos. Fairtrade certified is more readily used for front-of-house (visitor) and not for back-of-house (animal) food supply (Hanson and Holt, 2014). Schram (2008) argues that while food miles are important, it is not always in the best interests of the habitats we want to conserve. Buying Fairtrade products allows for sustainably and ethically produced rainforest products such as banana, coffee, and palm to form an economic support base for conservation strategies in the habitats that zoos wish to safeguard, as well as serving to support local populations in protecting their wildlife. There is certainly room for zoos to obtain nutritionally appropriate food items year-round from socially and environmentally ethical sources, even where the food miles are higher than buying local.

While growing food and browse on-site ranks highly as a practical consideration, it often falls behind other priorities (Hanson and Holt, 2014). There are examples: Paignton Zoo installed a hydroponic vertical farming system in 2009, with the goal of growing various nutrient-dense leafy vegetables to be fed to the zoo's animals (Frediani, 2010). For browsers such as giraffes, who may otherwise require browse to be shipped from abroad to meet their dietary needs, Townsend (2009) suggests that zoos with the available land could become self-sufficient in their browse provision. Indeed, one such example lies in Woburn Safari Park, which utilise a plantation of over 5,000 trees for on-site provisioning for their giraffes (Veasey, 2010). The plantation produces browse which can be fed fresh in the spring and summer and stored as silage for the winter months. For zoos without the capacity to grow such a plantation, initiatives such as the non-profit 'Browse Poster' aim to give animal keepers the ability to identify local plant species which are safe and nutritious for the species they house to eat – thus reducing the need for zoos to import browse to meet nutrient requirements. Furthermore, it is possible to obtain fresh, local, and organic produce at a reduced cost; many suppliers will offer produce that does not meet 'visual quality' requirements at a discount to offset some of the increased costs typically associated with a 'greener' shopping list (Schram, 2008).

Meat

As organisations concerned with high standards of animal welfare, which should influence their decisions on meat suppliers (Townsend, 2009). Almost all commercially produced livestock in Europe is fed on a diet of primarily soy. Many carnivores and omnivores require large quantities of flesh to thrive. While small mammals such as rats and mice, as well as large quantities of insects, can be easily bred in-

Section 5

house sustainably feeding larger carnivores such as wolves, tigers and bears pose more of a challenge. Conservation areas with excess or invasive animals are one area where ethically sourced meat can be procured. Some zoos have turned to roadkill as a viable alternative. Space Farms Zoo and Seneca Park Zoo in the US utilise deer carcasses from roadsides to feed their carnivores. Zoos can remove these carcasses on a contract basis and receive a profit for removing them; while not a consistent method of obtaining meat, it certainly aids in reducing costs while mitigating the animal wellbeing, environmental and social impacts associated with commercially farmed livestock. Some zoos have bred domesticated species in their care, as well as feeding some of the exotic species so named surplus such as antelopes. Other options for sustainable meat include venison, wild boar, and organic, high-welfare or grass-fed livestock, which can reduce the environmental and animal welfare impact of carnivorous diets in zoos considerably.

Food for staff and visitors

Some zoos have at least one or more plant-based options in their café or restaurant, supporting the need to move to a more animal-friendly and plant-based diet for both animal and planetary wellbeing. Zoos Victoria, Los Angeles Zoo, Toronto Zoo, and Dudley Zoo all offer plant-based options e.g. Meat Free Mondays, Go Green Week, tying the menu to the diet some animals in their care (Dudley Zoo, 2015). Communication on food in zoos and related conservation and sustainability practices can provide zoos a platform to raise awareness with public that their choice in food matters. Monterey Bay Aquarium provides tools and guides to help businesses and individuals to become actors of change by choosing environmentally sustainable seafood. Zoo Zürich use a less is more approach in their educational efforts, acknowledging there are many distractions during a visit, they communicate three key messages repeatedly across the zoo, including 'how you can contribute to conservation by adapting your diet' (Dressen, 2021).

Thoughts for the future

Following 'Refuse – Reduce – Reuse – Recycle', leftover food items in animal enclosures can be reduced by feeding less food to animals leaving food behind, reuse within the zoo as biofuel or a food source for detritivorous species. Reducing imported food by replacing part of the diet with pellets formulated with sustainable ingredients such as ethical soy (Wensing and Nijboer, 2010) without compromising the food-related behavioural, social, and psychological needs of animals (Brando and Buchanan-Smith, 2018). Sustainably feeding animals has vast potential as an educational tool for the millions of visitors attending zoos each year. A sustainable nutrition programme combined with appropriate interpretation that highlight the zoos' green nutrition sources, could influence behavioural change by empowering visitors to make more sustainable consumer choices (Schram, 2008). European aquariums, such as Nausicaa in France and Oceanario Lisboa in Portugal have introduced 'seafood size rulers' indicating the minimum size above which fish can be sustainably purchased (Koldewey *et al.*, 2009). Different types of storytelling can support zoos' missions of education and conservation (Brando, 2009). Many of the decisions made by zoos towards sustainability in food sourcing are largely focused within Europe, and some countries do not have frameworks they can follow to make ethical and sustainable sourcing decisions at all (Koldewey *et al.*, 2009). Global organisations such as the World Association of Zoos and Aquariums (WAZA), European Association of Zoos and Aquariums, and the World Ocean Network have attempted to mitigate these issues by introducing resources that facilities can follow to make choices that are ethical and sustainable, which we encourage zoos to engage with.

Conclusions

By developing solid sustainability frameworks which zoos can follow when making procurement choices, facilities housing animals in human care can ensure that their feed sourcing decisions remain in line with their core values: animal wellbeing, education, and the conservation of animals, people, and habitats globally. It also brings more awareness to the billions of animals slaughtered annually and their wellbeing, as well as related environmental impacts. Further, by making changes to adopt sustainable and ethical food sourcing policies in zoos, there is not only the opportunity to become more environmentally-conscious institutions in themselves but also to influence the decision-making of the over 100 million annual zoo visitors in Europe alone to encourage similar choices in their own day-to-day lives.

References

- Brando S. (2009). Conservation through storytelling and exhibit design intertwined; a new approach. Conference: ICEE, Paignton, UK
- Brando, S. and Harfeld J.L. (2014). Eating animals at the zoo. *Journal for Critical Animal Studies*, 12(1), 63-88.
- Brando, S. and Buchanan-Smith, H. M. (2018). The 24/7 approach to promoting optimal welfare for captive wild animals. *Behavioural Processes*, 156, 83-95.
- Browman, H.I., Cooke, S.J., Cowx, I.G., Derbyshire, S.W., Kasumyan, A., Key, B., ... and Arlinghaus, R. (2019). Welfare of aquatic animals: where things are, where they are going, and what it means for research, aquaculture, recreational angling, and commercial fishing. *ICES Journal of Marine Science*, 76(1), 82-92.
- Carere, C. and Mather, J. (Eds.). (2019). *The welfare of invertebrate animals* (Vol. 18). Springer.
- Dressen S. (2021). Looking Ahead Zoo Zürich's Masterplan 2050, p. 34. Available at: <https://www.waza.org/wp-content/uploads/2021/12/WAZA-mag-2021-03-web-1.pdf>
- Faunalytics 2020 Available at: <https://faunalytics.org/global-animal-slaughter-statistics-and-charts-2020-update/>
- Fernandes, J.N., Hemsworth, P.H., Coleman, G.J. and Tilbrook, A.J. (2021). Costs and benefits of improving farm animal welfare. *Agriculture*, 11(2), 104.
- Frediani, K. (2010). Vertical plant production as a public exhibit at Paignton Zoo. *Sibbaldia: The International Journal Of Botanic Garden Horticulture*, 8, 139-147.
- Gjerris, M., Birkved, M., Gamborg, C. and Brando, S. (2016). Eating to save wild-life: is a truly conservation-minded zoo/aquarium a vegan zoo/aquarium?. In *Food futures: ethics, science and culture* (2755-2765). Wageningen Academic Publishers.
- Hanson, J. and Holt, D. (2014). Sustainable food procurement in British and Irish zoos. *British Food Journal*, 116(10), 1636-1651.
- Hill, G. (2008). Sustainability and nutrition of The Deep's animal feed sources: a review. *EAZA News: Zoo Nutrition*, 4(1), 10-12.
- Koldewey, H., Atkinson, J. and Debney, A. (2009). Threatened species on the menu? Towards sustainable seafood use in zoos and aquariums. *International Zoo Yearbook*, 43(1), 71-81.
- Nijboer, J. (2020) Nutrition: Exotic and zoo animals. *MSD Veterinary Manual*. Available at: <https://www.msdevetmanual.com/management-and-nutrition/nutrition-exotic-and-zoo-animals/nutrition-exotic-and-zoo-animals>
- Schram, H. (2008). Feeding our animals without wasting our planet; some thoughts about sustainable zoo food. *EAZA News – Zoo Nutrition*, 4.
- Toni, M., Manciooco, A., Angiulli, E., Alleva, E., Cioni, C. and Malvasi, S. (2019). Assessing fish welfare in research and aquaculture, with a focus on European directives. *Animal*, 13(1), 161-170.
- Townsend, S. (2009). Incorporating sustainable practices for zoos and aquariums: a triple bottom line approach. *International Zoo Yearbook*, 43(1), 53-63.
- Van Huis, A. (2019). Welfare of farmed insects. *Journal of Insects as Food and Feed*, 5(3), 159-162.
- Veasey, J. (2010). Using an on-site browse plantation to ensure forage feeding to browsing herbivores at Woburn Safari Park. In: 6th European Zoo Nutrition Conference, Barcelona, 28-31 January, 53.

Section 5

- Weisee and Goldman 2020. We Lost a Football Pitch of Primary Rainforest Every 6 Seconds in 2019. Available at: <https://www.wri.org/insights/we-lost-football-pitch-primary-rainforest-every-6-seconds-2019>
- World Association of Zoos and Aquariums (WAZA) (2005). Building a Future for Wildlife. The World Zoo and Aquarium Conservation Strategy, The World Association of Zoos and Aquariums, Bern.
- World Association of Zoos and Aquariums (WAZA) (2005). Caring for Wildlife. The World Zoo and Aquarium Animal Welfare Strategy, The World Association of Zoos and Aquariums, Bern.
- Wensing, D. and Nijboer, J. (2010) Responsible feed in zoos. In: 6th European Zoo Nutrition Conference, Barcelona, 28-31 January, 13.

42. Nothing else, mothers – conceptual and ethical perspectives on motherhood in pig farming

S. Camenzind and J. Karg*

Unit of Ethics and Human-Animal-Studies, Messerli Research Institute, Vienna, Veterinaerplatz 1, 1210 Vienna, Austria; johanna.karg@vetmeduni.ac.at

Abstract

The economic value of the multifunctional body of sows cannot be overestimated. The female body plays a key role in the production process in pig breeding and farming. Traditional farming reduces motherhood to reproduction, motherhood is valued with the parameters quantity and quality of healthy piglets in the modern farm system. But with the increasing critique of crate stalls in Europe and the new conditions sows are held under, a new norm of the ideal of porcine motherhood appeared in breeding standards. Additionally to healthy piglets nestbuilding, interaction with the piglets, careful walking and lying down, and friendly behaviour towards the farmer are mentioned as normative standards, sows should meet. In this contribution the changing concept and new standard of motherhood is analysed first. Because motherhood has to be understood as a ‘thick ethical concept’ with descriptive and normative aspect, we ask secondly, what role does motherhood play from a moral point of view, particularly in the context of animal ethics?

Keywords: pig farming, pig breeding, motherhood, animal ethics, animal welfare

Introduction

Trust I seek and I find in you
Every day for us something new
Open mind for a different view
And nothing else matters

(Hetfield and Ulrich, 1991)

‘Female flesh is a powerful resource’ (Penny, 2010: 1). This statement doesn’t apply for the human sphere only, it is also true in the context of pig breeding and production. The multifunctional body of a sow plays a key role in animal farming. She alone has the ability to create and maintain a body, that can and will be consumed and/or have the potential to (re)produce further bodies. This ability makes female bodies also vulnerable to exploitation¹¹. Traditional farming reduces motherhood to reproduction, motherhood is valued with the parameters quantity and quality of healthy piglets in the modern farm system. But with the increasing critique in Europe¹² and the new conditions sows are held, a new norm of the ideal of porcine motherhood appeared in breeding standards. The new advertisement of the Danish Genetics company claims to select ‘a super sow that can handle its own piglets, produce more meat per sow per year, give birth to strong and robust piglets, and is easy to handle’ (DanishGenetics, 2021). It reflects, that besides the numbers of piglets also the caring behaviour of the sow is aimed at. But what does motherhood mean within a highly economic context and why is it morally relevant?

¹¹ On the development of capitalism from the perspective of women and reproduction, see Federici, 2021 and further Radin, 2001.

¹² See also the European Citizens’ Initiative ‘End the Cage Age’ (<https://www.endthecageage.eu/>) and the Communication from the Commission on the European Citizens’ Initiative (ECI) ‘End the Cage Age’ (European Commission, 2021)

Section 5

In the following contribution we will trace this current shift in motherhood concepts. In a first step the new concept is described. In a second step, we will put it in the context of animal ethics.

The new concept of motherhood in pig farming

There is no consistent definition of the terms ‘motherhood’ and ‘maternity’, neither for human nor for animal. Also the distinction between the two seems to blur. While ‘Maternity’ frequently appears in scientific, medical and legal contexts, it often refers to the time period of (a woman) being pregnant and ending with the birth. ‘Motherhood’ in contrast is mostly used as qualities of being a mother or refers to the state of being a mother. Because motherhood also involves a normative dimension, we will distinguish between both terms and use them as just described: Motherhood refers to ‘thick ethical concept’ with descriptive and normative aspects. Maternity is used descriptively as time period starting with pregnancy and ending with birth. Unfortunately, the adjective ‘maternal’ is used in both ways in the discussion too. But context provides usually enough information to make clear how it is meant.

The idea of motherhood in farm animal husbandry goes beyond that of a *natural phenomenon*. Motherhood is measured and aligned with what potentially results from it: the milk, the eggs, the piglet. Farm animal motherhood is controlled and mostly artificially initiated and terminated. As one of the few animals in farm animal husbandry, the sow’s motherhood does not end when she has borne her young. Pig production focuses on breeding and fattening healthy and fit pigs as much as possible. The lactating sow is the primary source of nutrition and immunity for the first weeks of life.

At the same time, the sow becomes the greatest health risk for the piglets (Tölle, 2004: 1): Crushing by the dam is reported as the most common cause (60%) of death for suckling piglets (Vasdal *et al.*, 2011). This is not only a financial disaster; also from an ethical point of view the avoidable death of animals capable of suffering has to be condemned. To prevent this from happening, two methods are currently practised: The first and most common is the crate stall, which physically separates the sow from the piglets. The crate does, at once, prevent any movement of the sow, apart from standing up and lying down.¹³ Where the other, alternative housing system is used, the sow either stays only the critical week after farrowing in the crate or has the opportunity for freer movement right from the start in housing systems such as the free farrowing pens. Here, the sow herself is to become the solution to the crushing problem. Certain behaviours such as ‘nest-building, interaction with the piglets, careful walking and lying down, and friendly behaviour towards the farmer’ (Tölle, 2004, Ocepek and Andersen, 2017) are intended to prevent crushing of the piglets and are therefore now targeted by many breeding programmes. As the conditions change, so do the normative standards for the sow: sensitivity, docility and carefulness now make a sow valuable. So-called ‘maternal behaviour’ is stated today by 60% of German pig farmers as the most important criterion for the selection of a breeding sow (Herrmann, 2020).

Breeding for ‘maternal behaviour’ is expected to have advantages for the animal: more movement for the sow and less risk for the young suckling piglet. At the same time, however, the demands on the sow are growing; for example, when she is supposed to react appropriately to piglet cries, but not to those cries caused by management measures by the farmer, such as castration (Tölle, 2004: 2f). The sow is meant to fulfil a motherhood ideal, but her actual needs before, during and after farrowing go beyond *more movement* and are not covered by the construct of a *super sow* only. This is morally problematic from several positions in animal ethics. But how should the new motherhood concept be assessed? What role does motherhood play from a moral point of view? In the next section we will put the new concept of motherhood into the context of animal ethics.

¹³ The majority of sows in Europe are kept in this type of crate (e.g. Austria 95% Schlatter and Lindenthal, 2018: 5).

Motherhood and animal ethics

A brief overview on the canonical works in animal ethics reveals that no in-depth discussion on the topic ‘animal motherhood’ has taken place. Although the argument of loyalty and the related duties that may exist between a mother and her child is known among preference utilitarians (Hare, 1981: 134ff.), it hasn’t found entry in Peter Singer’s work on animals (e.g. Singer, 2011 [1979]). The argument of loyalty is raised as a counterargument against utilitarianism. It says that utilitarianism fails to recognize and adequately represent personal relationships in the utility calculation. It would be worthwhile to adapt this subject to the animal realm and analyse if it is relevant in this context too. Also, in the animal right tradition specific motherhood duties and possible conflicts between them are neglected (e.g. Korsgaard, 2018, Regan, 2004 [1983]). As just described above regarding utilitarianism, an inspiration to analyse, adapt and modify the subject of motherhood in the animal rights view, may be found in the rights literature on humans.

Even more interesting is the observation, that approaches such as the ethics of care tradition, the capabilities approach and the like, which recognize and consider relational duties as morally relevant, don’t discuss motherhood deeply (e.g. Adams, 2013 [1990], Donaldson and Kymlicka, 2011, Gruen, 2015, Midgley, 1984, Palmer, 2010). Although the mother animal, shaped as dairy cow, laying hen and also sow, occurs within examples for the domination over and the exploitation of animals in general (e.g. Adams, 1991), the concept and normative dimension of motherhood – what defines a good (animal) mother? – is neglected. This lies in sharp contrast to the human realm, where motherhood is subject of widespread discussions (e.g. Heti, 2018, Badinter, 2013). Using a distinction from Nel Noddings (1986) care ethics could use this research gap to reflect about several relations between ‘the one-caring’ (human, sow), and ‘the cared-for’ (sow, piglets).

Although motherhood isn’t explicitly mentioned or discussed at length in animal ethics, we want to stress that especially relational approaches have the potential to acknowledge motherhood as a morally relevant feature. Although Nussbaum takes into account neither motherhood in general nor pig farming in particular, within her *Capabilities Approach* (2006) it is possible to make an argument about the importance of maternity and maternity as a special, temporal relation between a sow and her piglets. Among the ten capabilities, which according to Nussbaum define the minimal standard for a dignified existence and a just society, the capability ‘affiliation’ (nr. 7, Nussbaum, 2006: 398) is listed. In the case of motherhood one can derive the conclusion, that a mother sow has an entitlement to interact with her children and should have the opportunity to care for them. In fact her entitlement starts already before farrowing. Motherhood imposes additional conditions on a dignified life, including a retreat to build a nest during pregnancy. A soft base and sufficient nesting and burrowing material additionally functions as crushing prophylaxis after birth, that allows the piglets to crawl out from under the mother if given (cf. Röcklingsberg, 2001: 74).

In a more recent debate about moral emotions in animals Susana Monsó, Judith Benz-Schwarzburg and Annika Bremhorst (2013) argue that sympathy and its sensitivity to the morally relevant property of stress is a moral emotion. With reference to the capabilities approach, they say, ‘[i]f moral emotions akin to sympathy are indeed basic capabilities, this means that the individuals who possess them are entitled to lead lives in which the exercise of these capabilities remains possible for them’ (Monsó *et al.*, 2013: 296). So to prevent a sow to engage in affiliative behaviour towards her piglets can be stated as harm, that should be avoided. The foregoing is also of moral relevance within Claire Palmer’s relational approach (2010). The core of her approach is, that positive duties of humans towards animals are grounded on various distance and dependency relationships. This results for example in special duties towards domesticated animals, but not wild animals. Because of the dependency relationship of the domesticated sows and piglets, one could similarly argue for a special duty for farmers and care takers

Section 5

that arises before, during and after periods of motherhood. This could concern the following aspects: Provide space to retreat, nesting and burrowing material to build a nest or a special diet, that meets the increased requirements before, during and after the gestation period, such as the suckling period.

In a broader context, the new concept of motherhood raises also interesting questions about breeding of sows (Karg and Camenzind, 2022). Assuming that a mother should be given the opportunity to care for her piglets, current breeding practices should be challenged. From a caring perspective, it is incomprehensible that a sow would drop more piglets than she has teats to suckle. The capabilities approach and Palmer's relational approach would support the new breeding practice only, if the sow is actually able to carry out caring behaviour. Otherwise it would be only new source of injustice. Although in Nussbaum's and Palmer's case it is possible to formulate special duties before, during and after maternity, a precise answer what a good mother should be – in general or in the special case of sows – is not obvious. This means that an answer, if we should promote or prohibit new breeding trends cannot be given within their normative frameworks.

Summary and outlook

The initial situation was the observation, that the change of housing conditions for sows is accompanied by a change of the concept of motherhood. The farm animals whose motherhood benefits humans often spend most of their lives either preparing for birth, actually giving birth or lactating postpartum. Within these states, which differ significantly from those of fattening pig or cattle, an animal's interests and needs also change. The example of the sow shows that the experiences of motherhood are massively curtailed by restricted movement and mechanised processes in most pig farming and the sow cannot act out natural behaviours such as building a nest or interacting with her piglets. Although alternative housing systems offer a different view of pig farming, from an ethical point of view it is important to note, that also within these new conditions not only the economic benefits should count, but also the interests of the sow matters. This may lead us to rethink certain breeding standards.

Additionally a literature review showed, that the concept of motherhood in general, and motherhood in pig farming in particular has not yet been explored deeply with various approaches in animal ethics, even within relational approaches. However, Nussbaum and Palmer's approaches provide a good foundation for grasping the responsibility that surrounds keeping and handling a mother animal. In this contribution the focus layed on pig farming only. It is assumed that the concept of motherhood will vary among other mammalia or aves species. Supplementary to the concept of motherhood, it would also be interesting, to adapt similar questions to the concept of fatherhood in animals. Here we want to encourage to apply and adapt our thoughts to other animal groups.

References

- Adams, C.J. (1991). Ecofeminism and the Eating of Animals. *Hypatia* 6 (1): 125-145.
- Badinter, E. (2013). *The Conflict: How Overzealous Motherhood Undermines the Status of Women*. Metropolitan books, New York.
- DanishGenetics (2021). A foresight breeding program. Available at: <https://danishgenetics.dk/de/zuchtprogramm/>.
- Donaldson, S./Kymlicka, W. (2011). *Zoopolis. A Political Theory of Animal Rights*. Oxford University Press, Oxford.
- European Commission. (2021). Communication from the Commission on the European Citizens' Initiative (ECI) 'End the Cage Age' C(2021)4747 final, 30.06.2021, Brussels. Available at: https://europa.eu/citizens-initiative/initiatives/details/2018/000004_en.
- Federici, S. (2004). *Caliban and the witch. Women, the body and primitive accumulation*. Autonomedia, New York.
- Gruen, L. (2015). *Entangled Empathy: An Alternative Ethic for Our Relationships with Animals*. Lantern Books, New York.
- Hare, R.M. (1981). *Moral Thinking: Its Levels, Method and Point*. Oxford University Press, Oxford.

- Hetfield, J., Ulrich L. (1991). 'Nothing else matters'. Metallica, nr. 8. Elektra Records.
- Herrmann, W. (2020). Darauf legen die Zuchtunternehmen Wert. Available at: <https://www.agrarheute.com/tier/schwein/sauengenetik-darauf-legen-zuchtunternehmen-wert-564092>.
- Heti, S. (2018). *Motherhood*. Henry Holt, New York.
- Karg, J./Camenzind, S. (2022). Was ist eine gute Muttersau? Das Ideal der Mutterschaft zwischen Biologie, Ökonomie und Moral. In: DFG (Eds): *Wird Tierschutz dem Geschlecht gerecht? Zum Umgang mit weiblichen und männlichen Tieren*. Tierschutztagung München, 24.3–26.3.2022, LMU, München. (in press)
- Korsgaard, C.M. (2018). *Fellow Creatures. Our Obligation to Other Animals* Oxford University Press, Oxford.
- Midgley, M. (1984 [1983]). *Animals and Why They Matter*. The University of Georgia Press, Athens.
- Noddings, Nel (1986 [1984]). *A Feminine Approach to Ethics & Moral Education*. University of California Press, Berkeley/Los Angeles.
- Nussbaum, M.C. (2007 [2006]). *Frontiers of Justice: Disability, Nationality, Species Membership*. Harvard University Press, Cambridge *et al.*
- Ocepek, M. and Andersen, I.L. (2017). What makes a good mother? Maternal behavioural traits important for piglet survival. *Applied animal behaviour science* 193: 29-36.
- Palmer, C. (2010). *Animal Ethics in Context*. Columbia University Press, New York.
- Penny, L. (2012). *Meat Market. Female Flesh under Capitalism*. Winchester/Washington, Zero books.
- Radin, M.J. (2001 [1996]). *Contested Commodities. The Trouble With Trade in Sex, Children, Body Parts, and Other Things*. Harvard University Press, Cambridge/London.
- Röcklingsberg, H. (2001). *Das seufzende Schwein. Zur Theorie und Praxis in deutschen Modellen zur Tierethik*. Harald Fischer Verlag, Erlangen.
- Regan, T. (2004 [1983]). *The Case for Animal Rights*. Berkeley/Los Angeles: University of California Press.
- Singer, P. (2011 [1979]). *Practical Ethics*. Cambridge University Press, Cambridge.
- Schlatzer, M., Lindenthal, T. (2018). Analyse der landwirtschaftlichen Tierhaltung in Österreich – Umwelt und Tierschutzaspekte. *Wiener Umweltschutzabteilung – MA 22, 95*. Available at: <https://www.digital.wienbibliothek.at/wbrup/content/pageview/3298752>.
- Tölle, K. (2004). Sind die Muttereigenschaften von Sauen ein zukünftiges Selektionsmerkmal? *Lohmann Information* 3: 1-4.
- Vasdal, G., Østensen, I., Melišová, M., Bozděchová, B., Illmann, G. and Andersen, I.L. (2011). Management routines at the time of farrowing – effects on teat success and postnatal piglet mortality from loose housed sows. *Livestock Science* 136 (2-3): 225-231.

43. Reducing feed-food competition: impact of by-products and grazing in ruminant feeding

P. Cornale*, A. Mimosi and L.M. Battaglini

Department of Agricultural, Forest and Food Sciences, University of Turin, Largo Paolo Braccini 2, 10095 Grugliasco, TO, Italy; paolo.cornale@unito.it

Abstract

World population and global food demand are expected to increase in the next decades. Although some improvements have been achieved, livestock sector remains a major contributor to the impacts of agriculture. One of the sustainability themes that has recently seen an increasing interest is the conflict between feeding edible crops to people or to livestock. Large amounts of cereals and legumes used in conventional systems could instead be used more efficiently by monogastric animals or be consumed directly by humans. Therefore, reducing human-edible crops in animals' diets represents a promising way to increase the sustainability of ruminants with noticeable ethical implications. Two indicators are available in literature to assess the potential human-edible content in animal diets. In two experimental trials carried out with dairy cows, these two indexes improved significantly both when hazelnut skin, a by-product from hazelnut industry, was included in the diet of cows and with increasing level of grazing in mountain dairy farms. Ruminants play a major role in food supply chain: thanks to the microbiota in the rumen, they are able to convert fibrous feedstuffs (unsuitable for human consumption) into high valuable and nutrient-dense food (i.e. milk and meat), with increased nutraceutical quality of the products if grass or by-products are used. Moreover, the use of grasslands and pastures by ruminants, especially when land is unsuitable for crop production like in mountain areas, provides ecosystems services. It preserves land abandonment and provides a livelihood for populations living such areas, conserves local traditions and cultural heritage related to cheese-making activity, enriches biodiversity of pastures consequently increasing the accessibility for tourists. Using by-products in livestock diets transforms waste into source of nutrients, feeding the virtuous cycle of circular economy. Confirming previous findings, our results show that both grass-based feeding and use of by-products are effective feeding strategies to make dairy systems more sustainable, considerably reducing the feed-food competition as well as providing ecosystem services with relevant ethical and socio-cultural advantages.

Keywords: sustainability, human-edible feed, livestock systems, circular economy

Introduction

World population is expected to increase in the next decades, reaching 9.8 billion in 2050 (UN, 2019). This trend will bring along increasing global demand of food, including animal-derived products: milk and meat request is reported to increase by 60% in the future (Revell, 2015). Although significant improvements in reducing environmental impacts of livestock activities have been achieved in the past decades (Herrero *et al.*, 2015), livestock sector is a major contributor to the environmental impact of agriculture, due to greenhouse gas emission (Steinfeld *et al.*, 2006). Therefore, it is essential that sustainability guides the development of agriculture and animal productions. However, environmental issue is just one of the several aspects that are involved in the complex concept of sustainability. One of the topics that has recently seen an increasing interest is the feed-food competition (i.e. the use of potential human food in livestock feeding), especially in ruminant nutrition (Wilkinson and Lee, 2018). Worldwide, feeds containing large amounts of cereals and legumes are used in conventional systems to meet high nutrients' requirements of high producing cows. However, cereal grains and legumes seeds

could be used more efficiently by monogastric animals or be consumed directly by humans. On the other hand, ruminants, thanks to their microbiota in the rumen, are able to use fibrous feedstuffs that are unsuitable for human consumption, converting them into high valuable and nutrient-dense food (i.e. milk and meat) (Eisler *et al.*, 2014). Reducing the inclusion of human-edible crops and feedstuffs in animals' diets leads to a decrease in food–feed competition, representing a promising way to increase the sustainability of ruminants' production (Schader *et al.*, 2015).

Assessing feed-food competition at farm level

In livestock sector, feed efficiency refers to the capability of animals to produce high output (milk and meat) by using low input (feed). However, this index does not consider the type of feed fed to animals, but only its amount. In order to assess the feed-food competition at farm level, it's necessary to quantify the potential human-edible content in animal diets.

Two indicators are available in literature for that aim. The human-edible feed conversion efficiency (heFCE) is defined as the ratio between human-edible output in the form of animal products and the potential human-edible input via feedstuffs (Ertl *et al.*, 2015). Similarly, net food production (NFP) is calculated as the difference between the human-edible content in the milk (or meat) and the potential human-edible content in the feed consumed (Ertl *et al.*, 2016). The two indexes are expressed on a crude protein (CP) and gross energy (GE) basis. The feed-food competition indicators were determined in two different experiments. In a first study, the inclusion of hazelnut skin (HS), a by-product from hazelnut industry, was evaluated as a source of nutrients for lactating cows, replacing part of the concentrate (Renna *et al.*, 2020). Although the inclusion of HS in the treated group represented a small percentage of dry matter intake (about 6%), the cows fed with HS showed higher heFCE (CP: +21% and GE: +24%) and higher NFP (CP: +128% and GE: +149%) compared to control group (Figure 1).

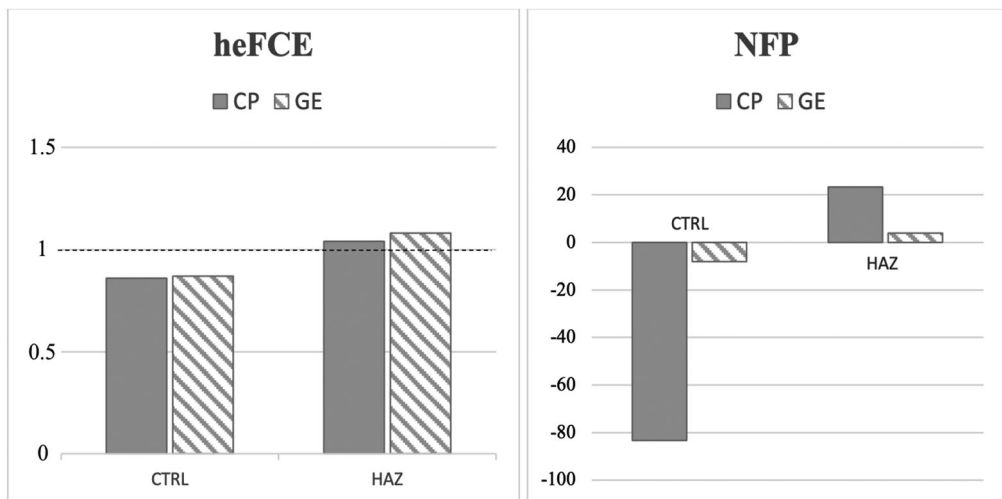


Figure 1. Human-edible feed conversion efficiency (heFCE) and net food production (NFP) for crude protein (CP) and gross energy (GE) of cows fed the control (CTRL) and hazelnut skin (HAZ) diets; the dashed line in heFCE sets at 1.0 indicates the efficiency threshold.

Section 5

In a second study, four scenarios of mountain dairy farms characterized by different use of environmental resources were compared (Verduna *et al.*, 2020). With increasing level of grazing as main feed ingredients in cows' diet (during the favorable season around the farm and at Alpine pastures on summer) the two indicators improved progressively. Compared to the indoor feeding in winter season, heFCE showed 5.3 to 8.2-fold increase for CP and 9.3 to 14.3-fold increase for GE (Figure 2). Similarly, NFP for protein and energy resulted negative in the indoor feeding scenario, showing that the cows during the winter season consumed more human-edible protein and energy than they produced in the milk.

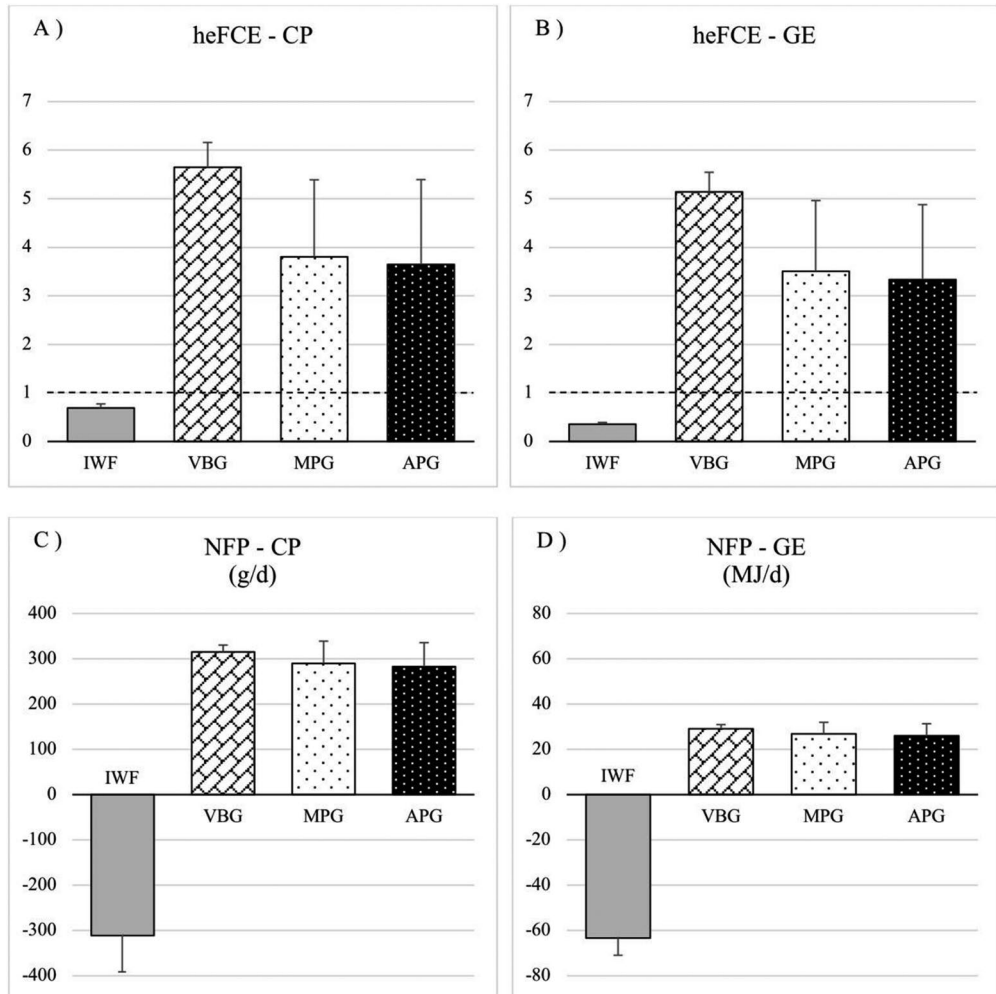


Figure 2. Human-edible feed conversion efficiency (heFCE) (A,B) and net food production (NFP) (C,D) for crude protein (CP) and gross energy (GE) comparing the four scenarios (IWF, Indoor Winter Feeding; VBG, Valley Bottom Grazing; MPG, Mountain Pasture Grazing); the dashed line in (A) and (B) sets at 1.0 indicates the efficiency threshold.

Reducing feed-food competition: an ethical responsibility

The two above-mentioned studies confirm that livestock systems based on grazing and use of by-products are able to reduce the feed-food competition without impairing productive performance of the animals. If this is a significant result from a zootechnical perspective, there are also additional ethical remarks that are worth to be highlighted.

From an environmental point of view, ruminants produce food by using marginal lands that cannot be cropped (Mottet *et al.*, 2018). Well-managed grazing activities in marginal land and mountain areas prevent hydrogeological disruption and landscape degradation by increasing the cover and abundance of perennial grasses and thus reducing soil erosion (Teague and Kreuter, 2020). Sustainable grazing strategies have long-term biodiversity benefits: selective defoliation due to dietary choices, treading and nutrient cycling maintain and enhance structural heterogeneity of sward, and thus botanical and faunal diversity (Fraser *et al.*, 2014). The production of food through pastoral resources also has evident repercussions on the containment of GHG emissions through the action of carbon sinks in the soil (O'Mara, 2012). Similarly, agro-industrial by-products are addressed as innovative raw materials to be used in feed formulations for livestock animals to reduce the environmental impact of animal-derived food production: recycling agricultural wastes in animal feeding represents a concrete opportunity for realizing circular economy in agriculture and thus creating sustainable agricultural systems (Halmemies-Beauchet-Filleau *et al.*, 2018).

From a social perspective, agricultural activities in marginal areas provide a livelihood for those areas' populations, for which agro-pastoral activities are often one of the few only feasible economical activities. This is even more relevant because rural and marginal mountain areas have been strongly affected by depopulation over several decades (Bätzing *et al.*, 1996). Moreover, sustainable agriculture is recognized as an effective way to safeguard local farming traditions and cultural heritage, especially traditions linked to pastoralism activity, cheese-making, etc.

Concerning the quality of the products obtained through grass-based systems, grazing and consumption of fresh grass are known for their beneficial effects on the nutraceutical properties of derived products. Pasture feeding has been demonstrated to have a positive impact on the nutrient profile of milk, increasing the content of some beneficial nutrients such as omega-3 polyunsaturated fatty acids, vaccenic acid, and conjugated linoleic acid (Joubran *et al.*, 2021). Similarly, vegetable by-products have considerable amounts of bioactive components such as polyphenols, including tannins, and vitamins. These compounds, when included in animals' diets, have positive effects on productive performance and improve the quality of livestock products, especially increasing their oxidative stability (Kasapidou *et al.*, 2015).

Finally, outdoor farming systems, if properly managed, have been demonstrated to increase animal welfare (Spigarelli *et al.*, 2020). Grazing and extensive systems allow animals to behave in a more natural way. Walking on pasture induce positive modifications of the animal's metabolism, with beneficial effect on animal's health, as well as reducing hock damage, lameness, and claw disorders. As previously mentioned, several vegetable wastes are rich in compounds that enhance the quality of milk and meat. Moreover, the same bioactive substances are also able to positively affect animals' health: polyunsaturated fatty acids, vitamins, and antioxidants introduced with the diet support animals' health improving immune response, reducing inflammatory processes, and enhancing the antioxidant status of animals (Salami *et al.*, 2019).

Conclusions

Confirming previous findings, our results show that both grass-based feeding and use of by-products are effective feeding strategies to make dairy systems more sustainable, considerably reducing the feed-food competition as well as providing ecosystem services with relevant ethical and socio-cultural advantages.

References

- Bärzing, W., Perlik, M. and Dekleva, M. (1996). Urbanization and Depopulation in the Alps. *Mountain Research and Development* 16(4): 335-350.
- Eisler, M.C., Lee, M.R.F., Tarlton, J.F., Martin, G.B., Beddington, J., Dungait, J.A.J., Greathead, H., Lui, J., Mathew, S., Miller, H., Misselbrook, T., Murray, P., Vinod, V.K., Van Saun, R. and Winter, M. (2014). Steps to sustainable livestock. *Nature* 507, 32-34.
- Ertl, P., Zebeli, Q., Zollitsch, W. and Knaus, W. (2015). Feeding of by-products completely replaced cereals and pulses in dairy cows and enhanced edible feed conversion ratio. *Journal of Dairy Science* 98: 1225-1233.
- Ertl, P., Zebeli, Q., Zollitsch, W. and Knaus, W. (2016). Feeding of wheat bran and sugar beet pulp as sole supplements in high-forage diets emphasizes the potential of dairy cattle for human food supply. *Journal of Dairy Science* 99: 1228-1236.
- Fraser, M.D., Moorby, J.M., Vale, J.E. and Evans, D.M. (2014). Mixed grazing systems benefit both upland biodiversity and livestock production. *PLoS One* 9(2): e89054.
- Halmemies-Beauchet-Filleau, A., Rinne, M., Lamminen, M., Mapato, C., Ampapon, T., Wanapat, M. and Vanhatalo, A. (2018). Review: alternative and novel feeds for ruminants: nutritive value, product quality and environmental aspects. *Animal* 12: s295-s309.
- Herrero, M., Wiersenius, S., Henderson, B., Rigolot, C., Thornton, P., Havlík, P., de Boer, I. and Gerber, P.J. (2015). Livestock and the environment: what have we learned in the past decade? *Annual Review of Environment and Resources* 40: 177-202.
- Joubran, A.M., Pierce, K.M., Garvey, N., Shalloo, L. and O'Callaghan, T.F. (2021). Invited review: A 2020 perspective on pasture-based dairy systems and products. *Journal of Dairy Science* 104: 7364-7382.
- Kasapidou, E., Sossidou, E. and Mitlianga, P. (2015). Fruit and Vegetable Co-Products as Functional Feed Ingredients in Farm Animal Nutrition for Improved Product Quality. *Agriculture* 5: 1020-1034.
- Mottet, A., Teillard, F., Boettcher, P., De'Besi, G. and Besbes, B. (2018). Domestic herbivores and food security: current contribution, trends and challenges for a sustainable development. *Animal*, 12: s188-s198.
- O'Mara, F.P. (2012). The role of grasslands in food security and climate change. *Annals of Botany* 110(6): 1263-1270.
- Renna, M., Lussiana, C., Malfatto, V., Gerbelle, M., Turille, G., Medana, C., Ghirardello, D., Mimosi, A. and Cornale, P. (2020). Evaluating the Suitability of Hazelnut Skin as a Feed Ingredient in the Diet of Dairy Cows. *Animals* 10:1653.
- Revell, B. (2015). Meat and Milk Consumption 2050: the Potential for Demand-side Solutions to Greenhouse Gas Emissions Reduction, *EuroChoices, The Agricultural Economics Society* 14(3): 4-11.
- Salami, S.A., Luciano, G., O'Grady, M.N., Biondi, L., Newbold, C.J., Kerry, J.P. and Priolo, A. (2019). Sustainability of feeding plant by-products: A review of the implications for ruminant meat production. *Animal Feed Science and Technologies* 251, 37-55.
- Schader, C., Muller, A., El-Hage Scialabba, N., Hecht, J., Isensee, A., Erb, K.-H., Smith, P., Makkar, H.P.S., Klocke, P., Leiber, F., Schwegler, P., Stolze, M. and Niggli, U. (2015). Impacts of feeding less food-competing feedstuffs to livestock on global food system sustainability. *Journal of the Royal Society Interface* 12, 20150891.
- Spigarelli, C., Zuliani, A., Battini, M., Mattiello, S. and Bovolenta, S. (2020). Welfare Assessment on Pasture: A Review on Animal-Based Measures for Ruminants. *Animals* 10: 609.
- Steinfeld, H., Gerber, P., Wassenaar, P., Castel, V., Rosales, M. and de Haan, C. (2006). *Livestock's Long Shadow: Environmental Issues and Options*. Rome: FAO. Available at: <http://www.fao.org/3/a0701e/a0701e00.htm>. Accessed 25 January 2022.
- Teague, R. and Kreuter, U. (2020). Managing grazing to restore soil health, ecosystem function, and ecosystem services. *Frontiers in Sustainable Food Systems* 29: 534187.

- United Nations (2019). World Population Prospects 2019: Highlights. Available online at: <https://www.un.org/development/desa/publications/world-population-prospects-2019-highlights.html>. Accessed 7 July 2021.
- Verduna, T., Blanc, S., Merlino, V.M., Cornale, P. and Battaglini, L.M. (2020). Sustainability of Four Dairy Farming Scenarios in an Alpine Environment: The Case Study of Toma di Lanzo Cheese. *Frontiers in Veterinary Science* 7: 569167.
- Wilkinson, J.M. and Lee, M.R.F. (2018). Review: use of human-edible animal feeds by ruminant livestock. *Animal* 12: 1735-1743.

44. Tracing responsibilities in food production with animals

S. Hartstang¹, D. Preuss¹, M. Giersberg² and P. Kunzmann^{1*}

¹University of Veterinary Medicine Hannover, Foundation, Applied Ethics in Veterinary Medicine, Institute for Animal Hygiene, Animal Welfare and Farm Animal Behaviour, Bischofsholer Damm 15, Geb. 116, 30173 Hannover, Germany; ²Animals in Science and Society, Department Population Health Sciences, Faculty of Veterinary Medicine, Utrecht University, Utrecht, the Netherlands; peter.kunzmann@tibo-hannover.de

Abstract

This paper summarises some results of the final report of the research project ‘Systematics of Responsibilities for Animal Welfare in the Livestock Sector’ (2018-2020). The project focused on the question who is fundamentally responsible for the treatment of farm animals. This question is largely and to some extent pointlessly discussed in the public. The study was commissioned by the German Federal Ministry of Agriculture (BMEL). It is based on a systematic examination of the term ‘responsibility’. Responsibility means that agents (who have the necessary means) act accordingly to their value preferences and cause consequences. In this respect, it must be taken into account that animal welfare (as based on altruistic reasoning) is not always given overriding priority in decision-making. This result becomes more plausible when analysing concrete examples of how real decisions were made. The report establishes a characteristic pattern that re-occurs in many discussions on problems in farm animal husbandry: There is an enormous gap between partakers ascribing responsibility to themselves or unto others. The report in contrast uses and extends well established ethical models and principles to create a matrix that makes it possible to say more precisely who is in fact responsible, and why. The report offers a detailed and rather extensive map of possible agents and stakeholders involved in animal husbandry based on the criteria of the matrix. This will lead to a much more distinguished judgement on responsibilities. The project has also developed a database tool in order to locate players in regards to certain characteristics. One result is to filter out those agents who may be called *big players* in the game at hand. The big food retailers and political bodies are prime candidates. The model can prove why they have indeed an enormous share of responsibility. The role of ‘the consumer’ is in turn to be reconsidered on this basis. The report finally offers an explanation on how responsibility and reliability are interconnected: It is much easier to stick to one’s own responsibilities if other players reliably stick to theirs. In turn, confidence in the system and its elements can be boosted whenever agents evidentially take up their responsibility and do ‘their jobs’.

Keywords: animal welfare, responsibility, reliability

Defining responsibility

The research study was based on the working definition that responsibility is the ‘attribution of actions and consequences of actions under value aspects’ (Kunzmann, 2010, p. 2). Responsibility arises where people steer the course of events out of their own decision. This can actually only be attributed to them where they had an opportunity to decide. It makes no sense to claim ‘responsibility’ for someone who cannot realise it.

In principle, decisions relevant to responsibility can be seen as ‘value preference decisions’: People choose from several options the one that realises the highest level of the most important values or goods for them. It is not trivial to establish this, because animal welfare rarely has ‘overriding priority’ among these goods. Animal welfare means the well-being and welfare of animals, which has an immediate, morally relevant value under the premises largely shared by our contemporaries (Zühlsdorf *et al.*, 2016). Animal

welfare as a moral issue is, however, necessarily altruistic at its core and inalienably so, i.e. directed towards the welfare of others (in this case; animals) and correspondingly difficult to enforce against other goods like income, food safety, etc.

Responsibility is not simply there, but is ascribed in ‘discourse’, in conversation, in debate, in argument. First of all, we have to notice whether responsibility is attributed to the bearer by others (passive) or whether he attributes it to himself and takes it on (active). When we take a closer look at this debate, we see that in the discussion about livestock farming, responsibility is used in two different directions: In self-attribution, players like to emphasise their good intentions, but refer to their limited possibilities. Subsequently, responsibility is attributed to someone else. The suspicion that responsibility was being shifted was confirmed. In detail, we were also able to reveal the rhetoric in which this happens. Once this recognised, it is easier to put it aside as an accessory to the discourse. A possible further consequence is not to trust this language game of the players too much when it comes to changes which are supposed to realise a good like animal welfare.

A matrix of responsibilities

In order to present a more realistic view of the situation, a matrix was distilled from already existing general responsibility models (Bayertz, 1995; Heidbrink *et al.*, 2017; Lenk, 2017; Loh, 2017; Lübke, 1998; Maring, 2001; Ropohl, 2002), which makes it possible to identify bearers of responsibility. It is characteristic that usually only a few players are named and negotiated as the responsible ones for animal welfare and/or animal protection in livestock farming. Our result is an extensive table that can be used to first of all more easily identify possible addressees of appeals or demands. In addition to the ‘usual suspects’ (cf. Hoischen-Taubner *et al.*, 2014), the list also includes players and groups of players who do not regularly appear in public discourse. The fact that, for example, ‘research funding agencies’ or ‘trade press’ appear in this list is not surprising in itself, but perhaps it also broadens the scope to name subjects more frequently who are not mentioned on a daily basis when it comes to promoting animal welfare and, if necessary, to hold them accountable. The example of piglet castration has shown the great influence trade press has here. This, in turn, is a concern of our list: To draw distinctions where they are necessary. For example, not to speak generally of ‘the media’, but to make the relevant distinction between what the specialised and trade press can actually do and what it does in contrast to the public media. Likewise, it is important to emphasise the well-known but often obscured distinction between ‘consumer’ and ‘citizen’.

We have also used the list to identify and name the so-called hidden players. This is also to name and classify possible subjects of responsibility who usually do not appear in usual public discourse; some of them are not even recognised as bearers of responsibility in more specialised discourses. For example, the important field of extension and advisors, which has or can have a key function in the realisation of animal welfare, is rarely addressed from the outside. Bringing such players out of their ‘virtual responsibility’ into their real one and demanding it can become an important policy field: In the respective contexts of action, it is self-evident how they influence animal welfare (albeit often indirectly), but their possible performance and, subsequently; their obligation in this is not brought up. The list in this report is certainly not exhaustive, but it does expand the space of possible addressees considerably.

A relevant side effect in the discussion of the addressees of responsibility is: we have also identified ‘bogus players’. In corresponding surveys and responses, responsibility is often attributed to collective players like ‘the consumers’, ‘the food retailers’, ‘the farmers’. We call them ‘aggregate collectives’, i.e. groups of individuals ‘who neither act with a common intention nor form an intentional group player’. As such, they cannot be an addressee of responsibility (Albertzart, 2015; Bratu, 2017; Isaacs, 2017). In contrast,

Section 5

it is very useful and extremely important to think about 'alliances' i.e. 'orchestrated' units of players from, for example, food retailers in their oligopolistic structure.

We have worked out central categories under which the many players and groups of players can be sorted. The classifications no longer follow chains of action (breeder, fattener, slaughterer, etc.), but classify the players according to characteristics of responsibility.

This includes the essential distinction between those who are structurally in a weaker position of power and those players who (can) exercise power, for example by being able to set norms and by their settings becoming binding for others. Logically, this also expands the space of their responsibility. All the more so if they can intervene in the spheres of action of others with compelling power. If they can only act in an advisory or informative capacity vis-à-vis others, for example, they can be called 'responsible' in a much weaker sense. This analysis also makes it very clear that the influence between the players is by no means purely economic: the exchange of information, advice and education, but also demands for quality, mutual monitoring and much more create important connections between players and link their responsibilities like driving belts in this system.

A category apparatus

The category apparatus thus obtained makes it possible to indicate very precisely for each individual player where spaces of action and power are and, consequently, in what sense and to what extent they bear any responsibility at all.

We have finally reduced it to four categories:

1. Type of contact to animals, either non-existent or direct or intermediate;
2. Means of establishing norms, either legal or non-legal (e.g. via technical norms);
3. Power of influence, either compelling or facultative (e.g. via consultation);
4. Sphere of influence, either in the own realm or reaching into others' realm of actions.

Applying these headings to the list of players results in a fairly complete catalogue of responsibilities in farm animal husbandry: We have worked out a short description for all players. This does not refer to where in the system a player has responsibility, but in what sense and to what extent we can reasonably attribute responsibility to him. This should make it easier to come to a judgement in appropriate discussions as to whether we are dealing with a relevant addressee at all.

Using the results of the report in this sense is facilitated by transferring them into an easy-to-use database programme. The categories can also be combined so that a targeted search for players with certain characteristics is possible. A central category is, for example, whether the respective players have direct contact with animals at all. These are then usually presented in media access, their behaviour is thereby controlled by animal protection law. However, the application of our tool also shows how limited the scope of responsibility of such players can be and usually is. Looking at further criteria classifications of these players, it becomes apparent that they all lack a certain power potential. They (mostly) do not have any compelling norm-setting power and their actions do not have any effect beyond their own area of responsibility. On the other hand, other combinations result in a list of those players who, as bottlenecks or so-called big players, can develop considerable power and assertiveness.

This probably makes the assumption plausible that special power nuclei exist in these places. It is no real surprise that corporations, system gastronomy and so-called alliances are mentioned. However, our model also provides plausible reasons why they are particularly responsible. Just naming big players is

not the real output here, but the reasoning why they are bottlenecks of responsibility and why they are therefore particularly obligated.

Levels of responsibility

From this we generate a scheme of levels of responsibility: The central idea here is a double attribution of responsibility. We distinguish between responsibility for action, i.e. responsibility for the genuine field of activity, and framework responsibility: (co-)responsibility for the framework conditions of one's own actions. If someone is held responsible for their actions, it can be asked whether they are being accused of deficits within the framework of their activities or whether they are being accused them of not shaping their field of action adequately and within their power. The driver of an animal transport may be accused of handling the animals too roughly or recklessly. However, one cannot reproach him for planning the route or for being right about the sensibility of the transports. To limit the responsibility here in a meaningful way, we have used the formula of *ultra posse nemo obligatur*: No one is obligated beyond his or her ability. The positive application of this formula means, and this is important to note at this point, that he bears full responsibility for the fulfilment of his 'duties' and cannot pass them on to the next higher authority. A nice illustration of responsibility in this sense would be, for example, the self-monitoring of animal owners according to § 11 para. 8 of the German Animal Protection Act. What is demanded there can be achieved by the animal owner at his own level of responsibility, and he is therefore obliged to fulfil it.

In general, an important step in the sensible use of responsibility is to ask very precisely what the *posse*, the ability at the respective level, actually consists of and to demand its fulfilment instead of giving in to the game of referring to the others, as is evidently common practice.

Nevertheless, the responsibility of the individual player does not simply consist of fulfilling their responsibility to act according to their respective roles: If the conditions do not allow for a satisfactory outcome at all, the players are obliged to strive for an improvement of the framework conditions as well. It is rarely apparent to what extent players access a higher level or in order to improve the conditions. For example, food retailers regularly point out that they cannot educate their customers (or similar) and can only trade with what the consumer buys. In fact, food retailing of course significantly changes the attitude of customers and in turn shapes their participation in the system to a considerable degree.

Demanding this responsibility and enforcing its realisation at all levels would be a suitable means of considerably curbing the shifting of responsibility (Te Velde *et al.*, 2002). The individual groups of players are addressed appropriately according to their power to act.

Subsidiarity and reliability

In the report we used the formula of the 'good job': If we are dissatisfied with the job someone is doing, we can mean that they are not doing their job well. We are accusing an enforcement deficit, so to speak. But if we think that he is doing a bad job, even if he is doing his job well, we have to talk about his job itself and start changes with and at those who design this job. Such a model allows for case-based attributions of responsibility to be made systematically: Players with less power to act (these are very often those with direct animal contact) are found at lower levels, whereas players with great power to act are to be located at higher levels, up to so-called players of the last level, who as the big players in the system of livestock farming are undoubtedly endowed with the greatest power to act. At the last level, it can then only be a matter of orchestrating the players who are responsible for the conditions in a network (Beckmann and Pies, 2006).

Section 5

That state bodies and the large alliances appear among the big players may not be surprising. However, demonstrating why certain tasks in livestock systems can only be regulated at this level redeems a politically relevant demand: subsidiarity. If it can be shown that other players or groups of players do not have the necessary degree of efficacy, it follows that the big players have a direct obligation and a justification for their intervention.

An approach based on the attribution of responsibility offers another advantage: it creates reliability in the system. A constant throughout the work on farm animal responsibility has been the recurring demand for ‘reliability’.

We have highlighted the meaning of reliability (Meijboom *et al.*, 2006) by distinguishing it from ‘trust’: trust presupposes that the partner acts in my interest (Hartmann, 2010; Herzog, 2013). Whoever trusts assumes goodwill towards the person whom he trusts and whom he considers trustworthy. And we have distinguished it from predictability, because even someone who is known not to be reliable is at least predictable in that (Hartmann, 2011; Herzog, 2013; Weigel *et al.*, 2017).

The framework for long-term change cannot be created by individual players in the system. They depend on other wheels in the entire mechanism turning in the same direction. This leaves only the big players and government action as guarantors of reliability.

Possible futures

In view of the political and social debate on animal welfare and animal protection in livestock farming, it is hardly possible at present to assess where the demands for animal-friendly husbandry will develop in the future and with what emphasis they will be pursued in the future. It is hardly calculable to what extent, at what speed and in what direction animal welfare measures will be protected.

Government measures promise planning security, such as the livestock strategy (cf. BMEL, 2019, p. 7). If state support for animal welfare measures does not fully or predominantly cover the additional costs or guarantee higher purchase prices, it will remain loss-making. Favourable loans are of little help, because the additional costs for extensive animal welfare measures still have to be earned in the future. Likewise, the protection of existing stables and other facilities creates reliability and planning security. However, this is precisely what thwarts animal welfare efforts, as it perpetuates forms of animal husbandry that lag behind current knowledge for many years to come.

Legal regulations that require higher animal welfare standards, on the other hand, could be a solution, since they have to be implemented by everyone (assuming appropriate structural and institutional safeguards). However, under the current premises of global market orientation, they would also have to – reliably – compensate for possible competitive disadvantages, if they are not to have negative effects on the existence of farms and businesses. It may also be questionable whether legal regulations will be withdrawn again by subsequent governments. Accordingly, the timeframe here is also in the order of magnitude of legislative periods, as long as there is no cross-party consensus and the corresponding provisions are made. On the other hand, there are also somewhat longer-term models, as in the case of the European Common Agricultural Policy (CAP) which certainly offers a lot of potential.

Uncertainties regarding the big picture cannot be eliminated: Whether the positions of animal rights movements will gain weight, whether questions about animal welfare will fade into background, etc., cannot be predicted, nor in which direction consumer purchasing behaviour will develop and how reliable citizens’ will is in the political arena. If no firm perspective can be identified in this, the players along the product chain will have difficulties in implementing measures for more animal welfare in the

long term. The economically more rational behaviour is to wait until the requirements become reliably concrete.

Conversely, however, it is possible that manageable measures that do not require large investments, that are reliably remunerated and that pay off within a manageable period of time are definitely requested and implemented.

The starting and final point of the whole analysis was the observation that the system of livestock farming is essentially characterised by a shifting of responsibility. An essential prerequisite to stop this shifting responsibility is: We must be able to rely on everyone consistently taking responsibility for their own actions and at the same time being accountable for them. And that they can do a good job if they do their job well. We must be able to rely on the fact that the effects of good and responsible action are not or cannot be counteracted by others. Establishing mechanisms and procedures to create this reliability is part of the 'steering responsibility' of the respective highest level, i.e. explicitly of the big players and also of the state. Accordingly, the conclusion of this summary is: According to this idea, reliability can promote the active assumption of responsibility. Perceived responsibility, in turn, can support and sustain trust in players, but above all trust in the system.

References

- Albertzart, M. (2015). Der Vorrang des Pflichtbegriffs in kollektiven Kontexten. *Zeitschrift für Praktische Philosophie* 2: 87-120.
- Bayertz, K. (1995). Eine kurze Geschichte der Herkunft der Verantwortung. In: K. Bayertz (Ed.), *Verantwortung. Prinzip oder Problem?* Wissenschaftliche Buchgesellschaft, Darmstadt, pp. 3-71.
- Beckmann, M. and Pies, I. (2006). *Ordnungsverantwortung – Konzeptionelle Überlegungen zugunsten einer semantischen Innovation.*, Diskussionspapier des Lehrstuhls für Wirtschaftsethik an der Martin-Luther-Universität Halle-Wittenberg Nr. 2006-10., Halle-Wittenberg, Germany.
- BMEF (2019). Bundesministerium für Ernährung und Landwirtschaft: *Nutztierhaltungsstrategie. Zukunftsfähige Tierhaltung in Deutschland. Stand Juni 2019.* Available at: <https://www.bmel.de/SharedDocs/Downloads/DE/Broschueren/Nutztierhaltungsstrategie.pdf>. Accessed 10 March 2022.
- Bratu, C. (2017). *Korporative und kooperative Verantwortung.* In: L. Heidbrink, C. Langbehn and J. Loh (Eds.), *Handbuch Verantwortung.* Springer, Wiesbaden, pp. 477-499.
- Hartmann, M. (2010). Die Komplexität des Vertrauens. In: M. Maring (Ed.), *Vertrauen – Zwischen sozialem Kitt und der Senkung von Transaktionskosten.* KIT, Karlsruhe, pp. 15-25.
- Hartmann, M. (2011). *Die Praxis des Vertrauens.* Suhrkamp, Berlin.
- Heidbrink, L., Langbehn, C. and Loh, J. (2017). *Handbuch Verantwortung.* Springer, Wiesbaden.
- Herzog, L. (2013). Persönliches Vertrauen, Rechtsvertrauen, Systemvertrauen. *Deutsche Zeitschrift für Philosophie* 61: 529-548.
- Hoischen-Taubner, S., Bielecke, A. and Sundrum, A. (2014). Reflexionen zu den Voraussetzungen und möglichen Hemmnissen eines zielführenden Wissenstransfers am Beispiel der Tiergesundheit in der ökologischen Nutztierhaltung. Available at: <https://www.orgprints.org/id/eprint/32077/>. Accessed 10 March 2022.
- Isaacs, T. (2017). Kollektive Verantwortung. In: L. Heidbrink, C. Langbehn and J. Loh (Eds.), *Handbuch Verantwortung.* Springer, Wiesbaden, pp. 453-475.
- Kunzmann, P. (2010). Die Verantwortung des Verbrauchers und einige ihrer Grenzen. *Journal für Verbraucherschutz und Lebensmittelsicherheit* 5: 1-5.
- Lenk, H. (2017). Verantwortlichkeit und Verantwortungstypen: Arten und Polaritäten. In: L. Heidbrink (Ed.), *Handbuch Verantwortung.* Springer, Wiesbaden, pp. 57-84.
- Loh, J. (2017). Strukturen und Relata der Verantwortung. In: L. Heidbrink, C. Langbehn and J. Loh (Eds.), *Handbuch Verantwortung.* Springer, Wiesbaden, pp. 35-56.
- Lübbe, W. (1998). *Verantwortung in komplexen kulturellen Prozessen.* Alber, Freiburg/München.

Section 5

- Maring, M. (2001). Kollektive und korporative Verantwortung. Begriffs- und Fallstudien aus Wirtschaft, Technik und Alltag, 2. LIT Verlag, Münster.
- Meijboom, F.L.B., Visak, T. and Brom, F.W.A. (2006). From Trust to Trustworthiness: Why Information is not Enough in the Food Sector. *Journal of Agricultural and Environmental Ethics* 19: 427-442. 10.1007/s10806-006-9000-2
- Ropohl, G. (2002). Welche Schwierigkeiten die Technik mit der Ethik hat. In: U. Arnswald and J. Kertscher (Eds.), *Herausforderungen der angewandten Ethik*. mentis, Paderborn, pp. 97-108.
- Te Velde, H., Aarts, N. and Van Woerkum, C. (2002). Dealing with Ambivalence: Farmers' and Consumers' Perceptions of Animal Welfare in Livestock Breeding. *Journal of Agricultural and Environmental Ethics* 15: 203-219. 10.1023/A:1015012403331
- Weigel, T.F., Hanisch, E., Buia, A. and Hessler, C. (2017). Vertrauen und Verlässlichkeit in der Chirurgie. *Der Chirurg* 88: 219-225.
- Zühlsdorf, A., Spiller, A., Kühl, S. and Gauly, S. (2016). Wie wichtig ist Verbrauchern das Thema Tierschutz? Präferenzen, Verantwortlichkeiten, Handlungskompetenzen, Politikoptionen. Zusammenfassender Ergebnisbericht zur repräsentativen Umfrage im Auftrag des Verbraucherzentrale Bundesverband e. V. (vzbv), Göttingen, Germany.

45. Broadening the debate on breeding innovations – on public engagement and the role of the Democs Game

F.L.B. Meijboom^{1}, D.M. Bruce², K. Kramer¹ and A. Bruce³*

¹*Utrecht University, Faculty of Veterinary Medicine, Sustainable Animal Stewardship, Yalelaan 2, 3584 CM Utrecht, The Netherlands;* ²*Edinethics Ltd, View Hill, 1 Peinsoraig, Uig, Isle of Skye IV51 9YD, United Kingdom;* ³*University of Edinburgh, School of Social and Political Science, Old Surgeons' Hall, Edinburgh EH1 1LZ, United Kingdom; f.l.b.meijboom@uu.nl*

Abstract

Genomic selection has become an important tool in livestock breeding, with further potential to widen both the traits and the breeds to which it can be applied. It also entails ethical and societal issues, for example in balancing animal health and welfare, fertility and climate impact alongside improving yields. As part of the Horizon 2020-funded BovReg project on advanced cattle genomics within the FAANG network, we examine these ethical questions. We argue that discussion of these complex issues must have broad scope, and identify three key factors. Firstly it should go beyond risk and animal welfare to encompass questions of climate change, environmental and land use impacts, and our changing relationships with animals. It should consider not only what is novel but to assess also existing production practices in the light of the genomic innovations. Lastly, because the issues of animal production are of increasing interest to European society, public engagement is an essential element for responsible innovation. To stimulate wider debate on genomic selection, we have created a Democs card game to engage with general publics and stakeholders. Democs is a proven tool for grassroots engagement on many technological issues in small groups with no prior knowledge. The game explains the context of current production and selection in cattle, and examines a range of relevant ethical and social issues raised by advanced breeding techniques. It invites players to form and submit their own views.

Keywords: genomic selection, public engagement, cattle

The need for ethical reflection

Genomic selection has become an important tool in livestock breeding and recent developments in the omics sciences are expected to improve this position as a breeding tool. This development could enable a range of opportunities for cattle breeding. These include improvements in efficiency and animal health, breeding approaches for improving minority breeds, and the incorporation of new breeding goals (e.g. reduced emissions of methane). The technology and its potential impact also entails ethical and societal choices, for example in balancing such factors as animal health and welfare, fertility and climate impact alongside improving yields.

As part of the BovReg project (www.bovreg.eu) on advanced cattle genomics within the FAANG network, we are examining these ethical questions. In contrast to some other reproductive technologies in animal breeding, such as cloning or genome editing, genomic selection has not raised much ethical attention. This can be explained partly by the characteristics of the technology itself, which is about the use of genome-wide genetic markers to predict the breeding value of selection candidates. Genomic selection therefore does not cross species boundaries, or require applying new invasive techniques on animals. However, that genomic selection is in certain respects continuous with earlier breeding techniques does not imply that it raises no ethical issues. It is also the result of a rather limited view on

Section 5

what counts as relevant ethical considerations. Nonetheless, genomic selection has not so far resulted in extensive public debate.

This also holds for the academic debate. An analysis of the academic literature found only few papers pay attention to ethical aspects. One of them is by Mark and Sandøe (2010). They highlighted issues such as unexpected effects on animal welfare due to correlations with non-measured traits, a higher risk of spreading deleterious mutations, the centralisation of capabilities and increasing dominance of specific breeds. They also discuss concerns over increased monopoly within dairy cattle breeding. The paper stresses the importance that stakeholders monitor the effects of genomic selection and that breeding companies act responsibly. This is in line with the development and regular updates of Code-EFABAR which since 2006 has aimed to define and maintain good practices for farm animal breeding (Code-EFABAR, 2020).

In this paper, we first argue that the discussion on genomic selection needs to reflect a wider range of ethical issues than is commonly the case. Secondly, we focus on extending discussion beyond the novel concerns, and lastly we argue that the current comparative lack of public debate provides an opportunity to work on public engagement. For this purpose, we have created a Democs card game to engage with general publics and stakeholders, on which we will elaborate in the second part of the paper.

Three factors to broaden the debate

A broader ethical scope: beyond risk and animal welfare

It is important to move away from confining ethical discussion to risk and safety. In response to legal frameworks and a no-harm principle, there is a tendency for ethical evaluation to focus primarily on the question to what extent a technology can harm others and what risks are involved (Fleming *et al.*, 2018). Notwithstanding the importance of minimizing risks to food safety, genetic diversity and economic risks, an ethical evaluation of breeding innovations should encompass more than this dimension. In addition, given the duties we have towards animals and the environment, the ethical considerations should not be restricted to human-related issues.

There has been attention to the positive and negative impacts the technology can have for animals and their welfare (Mark and Sandøe, 2010, Windig, 2012). This is a crucial dimension of the ethical assessment, as animal welfare is a core concept in animal ethics. Focussing ethical and public debates on animal welfare may overload the concept, however, because this invites people to 'translate' their wider concerns into issues of welfare. Furthermore, a welfare-only focus may overlook the substantial disagreement on how to conceptualize animal welfare that has a clear ethical background (e.g. Haynes, 2011; Webb *et al.*, 2019). Therefore, we argue for a broader scope in the discussion on the ethics of genomic selection that includes risk and animal welfare related arguments, but also goes beyond them. Our mapping of the potential ethical issues showed views on genomic selection that cannot be reduced to animal welfare concerns. These included questions raised by more critical voices, of justice, autonomy (Coles *et al.*, 2015) and 'biopower' i.e. changing animal bodies and populations in a direction dictated by particular human interests (e.g. Twine, 2010). There needs to be room to discuss such ethical issues as the instrumentalization of animals, changing power relations among stakeholders in animal breeding, or human-oriented ideas about perfecting animals. Most of the latter concerns are not specific to genomic selection and are relevant in conventional breeding programs or even livestock farming in general. But we argue that this is a reason to take into account a second factor in broadening the ethical discussion.

Beyond what is novel

Especially when changes are mediated by technology the ethical analysis tend to focus what is, ethically speaking, novel about those technologies. This starts from the assumption that the situation before the innovation was morally justified or acceptable. On that basis, genomic selection should be assessed only by considering whether it introduces novel ethical issues, compared with existing breeding practices. This view is problematic for three reasons, however. Firstly, a focus on novel questions can imply that one would only discuss potential problems. In this case it remains unclear why adopting a genomic selection innovation merits consideration at all. It has been argued that genomic selection enables more 'balanced' breeding and hence facilitates breeding animals that are both productive and have high welfare (Mark and Sandøe, 2010). The premise that current breeding practices raise ethical problems shows a need to make clear how adopting a genomic selection innovation can address these ethical issues either in a positive or negative way. This holds for situations in which ethical problems are amplified by the introduction of genomic selection innovation. However, when pre-existing ethical issues that can be solved or ameliorated by adopting a genomic selection approach this should be also included in the scope of discussion.

Secondly, adding one element to an existing practice can have far-reaching consequences that expand dimensions that were already present in the existing situation. Not without reason, genomic selection is portrayed as a next step in the development of existing breeding programs and as a paradigm shift at the same time (Meuwissen *et al.*, 2016). Whether a new technology raises new concerns is not a morally neutral question and its answer depends on one's normative perspective. We lack a settled point of departure to objectively define something as new and only then have an ethical discussion (Kramer and Meijboom, 2022).

Finally, it fails to reflect back on what may be ethically problematic in existing practices. The assumption that livestock breeding is an uncontroversial practice cannot be taken for granted, as the ethics of breeding animals has been widely discussed in various contexts (Olsson *et al.*, 2006; Leenstra *et al.*, 2012; Farstad, 2018). Therefore, ethical reflection on genomic selection should not only address novel issues of the technique on itself, but should consider it as part of the existing practices of breeding and livestock farming. This does not make the discussion easier, but can do justice to the complexity at stake. It is important that the discussion on the societal and ethical dimensions is not a task for only ethicists or social scientists. It needs the inclusion of stakeholders and the general public. This leads to our third factor.

Public engagement

Genomic livestock breeding is a complex technical field that requires multiple forms of expertise of highly skilled persons and specialised organisations, which tend also to be international. The infrastructure needed to guarantee high quality in research, product development and implementation also leads to a gap between the experts in genomic selection, the users (farmers) and the general public. The economic relation between breeding companies and their clients, means that farmers may participate in discussions on breeding innovations, or have their views studied (e.g. Lund *et al.*, 2021), but the general public is seldom consulted. This is problematic because public engagement is recognised as an essential element in responsible innovation (Owen *et al.*, 2021). Only engaging with technical experts risks limiting the debate to dominant perspectives (Kayumova *et al.*, 2019). Two-way public engagement is crucial to invite lay persons to form their own views and enable them to participate in the debate, and to give the general public a voice in making breeding organizations, companies and governance institutions more responsive and accountable. In line with this step, it is important to engage with wider publics, who are showing an interest in animal production but are

Section 5

rarely consulted about the priorities and direction of livestock breeding. By the same token, general public comments need to be informed to have credibility, and communicating a complex subject such as genomic selection is challenging.

The Democs game

An integral part of the European BovReg project is to conduct public engagement as part of our aim for making responsible innovation. For this purpose, we have created a Democs card game, the purpose of which is to stimulate wider debate among stakeholders, and to give small groups of lay people in different European countries the opportunity to discuss and express their views about genomic selection in cattle, including ethical questions about breeding priorities and practices more generally. Democs has been a proven tool for 20 years to enable grassroots engagement on many technological issues in small groups, assuming no prior knowledge. The cards are the 'expert' and provide the basis for group learning and discussion. These cards have been written in a detailed iterative process drawing upon the technical, ethical and Democs game expertise and insights from BovReg partners.

Story cards introduce different aspects of cattle production, genomics and breeding through case studies of imaginary people involved the field or affected by it. These include a breeding company CEO, a genomics researcher, a veterinarian, an Alpine dairy farmer of specialty cheeses from local breeds, a government climate scientist, an environmentalist and a critical consumer. Each one explains their involvement and an ethical dilemma which it presents. Information Cards provide the context of different approaches of cattle production, with which publics may not be familiar. They explain genomic selection and its potential, and give information on animal health and welfare, land use, climate and environmental impacts. Issue Cards then open up relevant ethical and social issues arising from advanced breeding and production, expressing differing standpoints to reflect the range of opinions.

Players are invited to discuss and to form their own views built up from the suite of cards. There are two outputs. One is group opinion statements, written on Cluster Cards, based on the cards the group members have chosen to discuss. The second output is individual votes by each player on priorities and questions in cattle breeding, with their reasons in their own words. These outputs will be analysed, and are expected to provide valuable qualitative information on public views on genomic selection in cattle and related issues.

The game was first produced in a pilot version for beta testing for accuracy, balance and being understandable by lay people, and is now being finalised for distribution, with the expectation of being translated into various languages, so that people can take part in their 'mother tongue'. Covid restrictions on small face-to-face group meetings have delayed playing somewhat. We are investigating the feasibility to adapt the game to be played on-line, which is not a simple task for a tool that is designed to feature interactive discussion.

Conclusions

Breeding innovations raise ethical issues that are not limited to risk and animal welfare, and that go beyond what is novel about such innovations. The focus on what is new may ignore what problems genomic selection can solve or ameliorate, which undermines the possibility of making a positive ethical case for its adoption in breeding. On the other hand, such a focus on what is novel may wrongly suggest that an innovation in genomic selection is ethically unproblematic if it raises no new issues: the innovation might contribute to the persistence of pre-existing ethical problems or be part of a gradual development in an undesirable direction. This dynamic that comes with innovations in genomics selection and the concept of responsible innovation require discussing such ethical issues with a wide range of stakeholders,

and we invite engagement with those involved in livestock breeding and innovation. The Democs game that we have created facilitates the engagement of stakeholders, but especially of lay publics in ethical discussions on genomic selection and cattle breeding.

Funding

This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under grant agreement No 815668

References

- Code-EFABAR (2020). Code of Good Practice for Farm Animal Breeding Organisations. Available at: https://www.responsiblebreeding.eu/uploads/2/3/1/3/23133976/01_general_document_2020_final-code_efabar.pdf.
- Coles, D., Frewer L.J. and Goddard, E. (2015). Ethical Issues and Potential Stakeholder Priorities Associated with the Application of Genomic Technologies Applied to Animal Production Systems. *J Agric Environ Ethics* 28:231-253
- Farstad, W. (2018). Ethics in animal breeding. *Reproduction in domestic animals*, 53, 4-13.
- Fleming, A., Abdalla, E.A., Maltecca, C. and Baes, C.F. (2018). Invited review: Reproductive and genomic technologies to optimize breeding strategies for genetic progress in dairy cattle. *Archives Animal Breeding*, 61(1), 43-57.
- Kayumova, S., McGuire, C.J. and Cardello, S. (2019). From empowerment to response-ability: Rethinking socio-spatial, environmental justice, and nature-culture binaries in the context of STEM education. *Cultural Studies of Science Education*, 14(1), 205-229.
- Kramer, K. and Meijboom, F.L.B. (2022), The ethics of innovations in genomic selection: on how to broaden the scope of discussion, *Journal of agricultural and environmental ethics*, *under review*.
- Lund, T.B., Gamborg, C., Secher, J. and Sandøe, P. (2021). Danish dairy farmers' acceptance of and willingness to use semen from bulls produced by means of *in vitro* embryo production and genomic selection. *Journal of Dairy Science*, 104/7; 8023-8038, <https://doi.org/10.3168/jds.2020-19210>.
- Mark, T. and Sandøe, P. (2010). Genomic dairy cattle breeding: risks and opportunities for cow welfare. *Animal Welfare*, 19(S), 113-121.
- Meuwissen, T. Hayes, B. and Goddard, M. (2016). Genomic selection: a paradigm shift in animal breeding, *Animal Frontiers*, 6/1: 6-14, <https://doi.org/10.2527/af.2016-0002>.
- Olsson, I.A.S., Gamborg, C. and Sandøe, P. (2006). Taking ethics into account in farm animal breeding: what can the breeding companies achieve? *Journal of Agricultural and Environmental Ethics*, 19(1), 37-46.
- Owen, R., von Schomberg, R. and Macnaghten, P. (2021). An unfinished journey? Reflections on a decade of responsible research and innovation. *Journal of Responsible Innovation*, 8(2), 217-233.
- Twine, R. (2010). *Animals as biotechnology: ethics, sustainability and critical animal studies*. London: Earthscan.
- Webb, L.E., Veenhoven, R., Harfeld, J.L. and Jensen, M.B. (2019). What is animal happiness?. *Annals of the New York Academy of Sciences*, 1438(1), 62-76.
- Windig, J.J. (2012). Genomic Selection: Alternatives, Risks and Benefits. Ethical Consideration in Livestock Breeding. In: Leenstra, F. *et al.*; Ethical consideration in livestock breeding. Proceedings of the first LowInputBreeds Symposium. Research Institute of Organic Agriculture (FiBL), Frick, Switzerland.

46. Society and ethics in animal breeding: a bibliometric analysis

M. van der Sluis*, K.H. de Greef and G. Bonekamp

Wageningen University & Research, P.O. Box 338, 6700 AH Wageningen, the Netherlands;

malou.vandersluis@wur.nl

Abstract

A bibliometric analysis was performed to explore to what degree published animal breeding studies (on cattle, pigs and poultry) explicitly address societal issues and ethics, and what themes were addressed. A combination of search terms in Scopus resulted in about 24,500 publications on farm animal breeding since 1990, of which 673 included a society- or ethics-related term. A two-person manual second (on titles) and third (on the title, key words and abstract) selection step reduced the number to 270 papers that met our criteria, so overall, about 1% of the identified published animal breeding studies explicitly refers to themes being a societal issue in the title, key words or abstract. The number of papers per publication year increased rapidly after the year 2001, and peaked around 2010. Animal welfare and behaviour (AW) was the trait that was addressed most, especially for poultry, and to a lesser extent also for pigs and cattle. Explicit reference to ethics was made in 65 (24%) of the 270 selected papers. In this 'explicit on ethics' subset, the themes genetic modification (GM), biotechnology (BT) and AW were dominant. The subset of studies on GM that explicitly mentioned ethics was assessed in more detail, to examine how, and to what extent, the topic of ethics was discussed, and whether specific actions were mentioned. The inclusion of ethics in these publications varied along a broad spectrum, ranging from ethics only being mentioned as being relevant to ethics being the main topic of the paper. Several studies called upon different stakeholders to take action, mainly in terms of actively taking part in discussions. This study concludes that: (1) the human eye/brain seems to be necessary to select on criteria in a bibliometric study like the present – the visual inspection removed about 60% of the 'hits' for being false positive; (2) animal breeding work on AW issues seems to be more prone to use wording that is explicit on societal issues compared to breeding work on other sustainability issues; (3) studies on BT, GM and AW are the main categories containing explicit reference to ethics, papers on other themes mention ethics to a considerably lesser extent; and (4) between the studies on GM that explicitly mention ethics, there is substantial variation in how they deal with ethical reasoning.

Keywords: animal welfare, genetic engineering, genetic modification, genetic selection

Introduction

The Western society is sensitive to processes and results of animal farming practices. The increasing acknowledgement of moral status of animals unquestionably plays a role in this. Animal breeding (that is, the process of genetic selection in populations to systematically change genetic characteristics of the next generations) is an integral part of the animal production system. Animal breeding activities can both be a cause for concern and a solution to problems. For decades already, undesired side-effects of conventional breeding practices (see for example Rauw *et al.* (1998)) are issues of societal unease. Also, the introduction of genetic modification or gene editing is clearly an example of ethical concern (see for example Naab *et al.*, 2021). In the late nineties and early 2000s, several studies addressed issues related to breeding activities (Gamborg and Sandøe, 2005), often using the term 'sustainability' as the entry. In the SEFABAR project, which was an EU-funded collaboration between the breeding industry and several academic disciplines, Liinamo and Neeteson (2001) concluded that most breeding studies were relevant to sustainability issues, but little of them were really explicit on this. Now, two decades later, we raise a similar question, but on the explicit reference of societal and ethical issues related to animal breeding

activities. A bibliometric analysis was performed, in which we assessed general trends in publications on societal aspects of animal breeding, regarding the species and main societal or ethical issues under study. We specifically focused on dairy cattle, pigs, and chickens. Moreover, to highlight how these publications address these issues, we analysed a subset of papers in more detail. In the subset of studies that specifically mentioned ethics in the title, keywords or abstract, and addressed the topic of genetic modification or engineering, we assessed how, and to what extent, the topic of ethics was discussed, and whether specific actions were mentioned.

Methods

The bibliometric analysis was performed in Scopus, using a three-step selection process (Table 1). The first step consisted of a search in Scopus using a combination of a set of keywords regarding: (1) animal; (2) breeding; (3) society or ethics; and (4) concerns. In the following two steps, false positive hits were excluded. In these steps, at least two people decided together which decision should be made, to reduce subjectivity in the selection process.

Using the final data set of publications (n=270; Table 1), the examined topics (Table 2) were assessed for each of the publications, based on the title and keywords (and when not conclusive, based on the abstract). A distinction was made to categorise the studies into: (1) having animal traits as the topic of attention; or (2) having breeding methodology as the topic of study. Moreover, each abstract was assessed to characterise the type of study as either 'experimental' (based on an experiment, a dataset, simulation study or similar) or 'descriptive' (reviewing literature, reporting from expertise, et cetera), and to assess whether the term ethics was explicitly mentioned ('ethic', with potential prefixes or suffixes) or not.

To highlight how the resulting publications address ethical issues, we selected a subset of publications to examine in more detail. We selected publications that met two criteria: (1) explicit mentioning of ethics in the title, keywords or abstract; and (2) genetic modification (GM) as the topic under study, as GM is a novel, progressive technology for which choices are to be made on its acceptability for practical application. In total, 21 publications met these criteria, 18 of these were available in English and were included. These publications were examined in more detail to determine how, and to what extent, the topic of ethics was discussed, and whether specific actions were mentioned in these publications, and if so, who should take these actions.

Table 1. Workflow and selection criteria used in the bibliometric analysis.

Step in the workflow	Description of the process
Step 1: Literature search (n=673)	Automated search in titles, abstracts and key words, in publications from 1990 onwards (search performed on the 3 rd of December, 2021). Only publications with at least one of the required search terms for each of the categories below were included: - <i>Animal</i> : animal AND production; animal AND farm*; dairy AND cattle; poultry; pig* - <i>Breeding</i> : breeding AND selection; genetic AND selection; breeding AND genetic - <i>Society or ethics</i> : soci*; public; ethic*; moral* - <i>Concerns or discussion forms</i> : concern*; issue*; problem*; dilemma*; question*; demand*; worry; worries; debate; discourse; discussion
Step 2: Selection based on titles (n=400)	Title based manual exclusion of false positives: papers that did not address breeding or the species of interest (for example pigeons and guinea pigs, due to the term pig*)
Step 3: Selection based on title, key words and abstract (n=270)	Manual exclusion of publications that did not have animal breeding or genetic engineering in the species of interest as a topic of focus, based on the title, key words and abstract

Section 5

Table 2. Structuring of topics examined in the publications.

Species under study	What societal or ethical issue is explicitly mentioned?	
	Animal (trait) related	Methodology related
Chickens	Animal health	Animal genetic resource management
Pigs	Animal welfare/behaviour	Biotechnology
Dairy cattle	Environment	Breeding goal definition
Across species	Food safety/security	Genetic modification
	Heat stress	General methods
	Meat quality	
	Multiple	
	Resilience/robustness	

Results

In total, approximately 24,500 papers on farm animal breeding since 1990 were identified. After inclusion of the societal aspects constraint and our subsequent selection, 270 papers were left. This shows that, with our selection criteria, few publications on animal breeding (around 1%) appear to address societal issues. The number of publications on societal aspects of animal breeding increased from about the year 2000 onwards, peaking around the year 2010 (Figure 1). Of these 270 publications, 86 (32%) were classified as belonging to the category ‘experimental’. The topics that were studied differed per species (Table 3). A large proportion of the publications focused on animal welfare and behaviour (AW), especially for poultry (48%). For pigs, many studies focused on meat quality, besides AW. For cattle, aside from AW, many studies focused on animal health. For the papers on animals in general, the main theme was GM. Table 3 illustrates in brackets, per species-topic combination, the percentage of publications that explicitly mentioned ethics. Out of the 270 publications, 65 (24%) mentioned ethics explicitly in either the title, keywords or abstract, resulting in 90 species-topic combinations that included ethics. A number of topics include relatively many studies that explicitly refer to ethics: AW, environment (ENV) and resilience or robustness (RES; although it must be noted that for both ENV and RES these high percentages are based on a very limited number of studies, see Table 3), biotechnology (BT), and GM. For the other themes, few studies explicitly mentioned ethics.

Two observations in the analysis of the publications on GM mentioning ethics draw attention: (1) the variation in the degree of addressing ethics, ranging from ethics only being mentioned as being relevant, but not elaborating, to ethics being the main topic of the paper; and (2) the degree to which, and to whom, there is a plea for action. An example of minor addressment of ethics comes from Bhat *et al.* (2017), who mention the term ethics only in the abstract, stating:

Nonetheless, barring ethical concerns gene-editing entailing economically important genes offers a tremendous potential for breeding animals with desirable traits.

Another example comes from Doran *et al.* (2018), who only cited ethical concerns as a motive for genetic approaches to identify male chicks *in ovo* to avoid the current practice of culling male chicks post-hatch, which is considered an ethical issue. An example of extensive elaboration on ethics comes from Kramer and Meijboom (2021), who discuss a novel definition of ‘telos’ (that is, the set of good activities that members of a species typically pursue and are equipped to perform well), and apply this

Table 3. Number of publications¹ addressing specific topics by species, with the percentage of studies explicitly mentioning ethics per species-topic combination shown in brackets.

Topic under study		Chickens	Pigs	Dairy cattle	Across species
Animal (trait) related	Animal health	3 (0%)	5 (20%)	12 (17%)	9 (22%)
	Animal welfare/behaviour	26 (23%)	15 (40%)	13 (38%)	20 (70%)
	Environment	0 (0%)	1 (100%)	4 (50%)	5 (40%)
	Food safety/security	2 (0%)	1 (0%)	6 (17%)	3 (0%)
	Heat stress	1 (0%)	1 (0%)	1 (0%)	0 (0%)
	Meat quality	1 (0%)	11 (27%)	0 (0%)	1 (0%)
	Multiple	4 (25%)	2 (0%)	2 (0%)	4 (0%)
	Resilience/robustness	2 (100%)	1 (0%)	1 (0%)	2 (50%)
Methodology related	AGRM ²	2 (0%)	3 (0%)	5 (0%)	14 (0%)
	Biotechnology	1 (100%)	0 (0%)	1 (100%)	14 (50%)
	Breeding goal definition	1 (0%)	0 (0%)	5 (0%)	4 (50%)
	Genetic modification	4 (50%)	1 (100%)	7 (43%)	27 (56%)
	General methods	1 (0%)	1 (0%)	5 (0%)	7 (14%)
Other	Other	6 (0%)	16 (19%)	26 (4%)	25 (16%)

¹Publications addressing multiple topics or multiple of our key species (chickens, pigs and/or dairy cattle) are included multiple times, resulting in n=335.

²AGRM = animal genetic resource management.

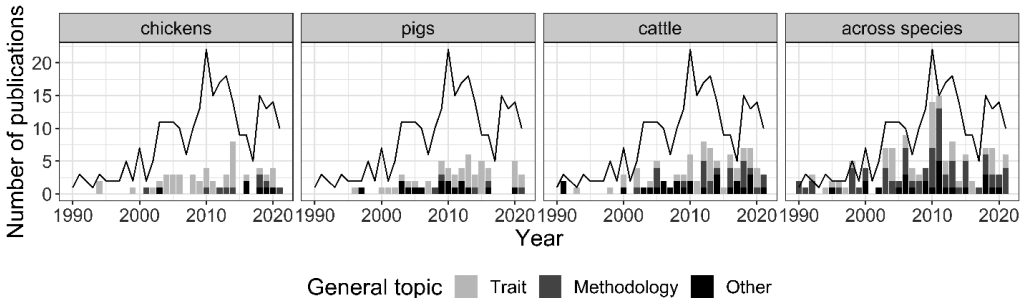


Figure 1. Number of publications on the different general topics and species. The black line represents the total number of publications by year (n=270), whereas the bars represent, per species, the number of studies focussing on certain general topics. Publications addressing multiple topics or multiple of our species categories are included multiple times (n=335).

to genome editing and genomic selection aimed at improving welfare of the animals. Several studies mentioned actions that can be taken and called upon different stakeholders. For example, Olsson and Sandøe (2004) called for action by animal welfare scientists, stating:

[...] by using their expertise, animal welfare scientists can help research and development specialists and pure scientists to pursue developments in biotechnology in an acceptable way, and can call a halt, where necessary, to applications with an unacceptable impact on animals.

Section 5

Another study, for example, called upon researchers and ethical animal research committees to consider specific principles in decision-making (Rose *et al.*, 2013). Moreover, in various publications, animal breeding organisations or companies, scientists and GM food industry leaders were called upon to engage in discussions.

Discussion

In this bibliometric study, we examined general trends in publications on societal aspects of animal breeding, regarding the species and main societal or ethical issues under study. Moreover, we analysed a subset of papers on GM, explicitly mentioning ethics, in more detail.

In the bibliometric analysis it became clear that the specificity of our search string was low, as only 40% of the initially obtained publications actually matched our goals. This highlights the importance of manual selection steps. The choice of search terms potentially has a large impact on which papers are found, and a different combination of search terms might have resulted in different outcomes. However, in our case, we selected the search terms based on a discussion with three persons, including testing various other combinations of search terms (not presented here). Nevertheless, in hindsight the use of the term 'poultry' may have resulted in some missed studies, as not all studies on laying hens and broilers may explicitly refer to 'poultry'. Most of the examined publications were not based on experimental work and many were focussed on animal breeding or genetic engineering in general, as opposed to focussing on one or more specific species or selection traits. In this, the (non-validated) impression has grown that most studies that explicitly use society-directed terms are probably of another nature than conventional 'animal breeding studies'. A large amount of studies dealt with AW, which is not surprising, given that AW is an important societal concern ('consumer concern' in earlier literature). However, the fact that nearly half of these publications explicitly referred to ethics is notable, seeing the low percentage of reference to ethics for most other animal-related traits. Popularly stated, 'doing good' as a breeder is apparently more prone to be mentioned explicitly when referring to AW than for other sustainability traits, such as animal health or food safety and security.

The subsequent analysis of ethics in GM studies revealed that the extent to which ethical concerns are discussed strongly differed between studies. Furthermore, many studies also mentioned more general concerns, such as escape of GM animals (Houdebine, 2014). Moreover, different stakeholders were called upon to take action, with the main action being to actively engage in discussions on (the ethics of) GM in animal breeding. Several studies emphasized that the goal of GM is of relevance for determining whether its use is deemed ethically acceptable. For example, Kramer and Meijboom (2021) discussed that, using their concept of 'telos', the use of breeding technologies for removing or changing physical features and disenfranchising animals (that is, decreasing animals' capacity to suffer) by removing their desire to engage in characteristic activities would not be supported, whereas adapting animals to increase their robustness against environmental stressors would not be intrinsically objectionable. Interestingly, a number of studies highlighted that genetic engineering or modification is not so different from traditional selection practices, which have already resulted in issues regarding AW, and might even aid in countering these issues (e.g. Greger (2010)). Furthermore, although many papers discussed whether it is ethically acceptable to use GM, the reverse was also addressed:

[..], it is clear that the alternative to refrain from using any form of GM or genome editing is also an active choice that requires ethical considerations. (Eriksson *et al.*, 2018).

Overall, this study revealed that the degree of ethical reflection varied strongly between the identified publications.

To summarize, this study shows that of the 1% of animal breeding related papers that address societal aspects explicitly, most address AW. Many studies on BT, GM and AW contained explicit reference to ethics, yet in the subset of studies on GM that mention ethics, there is substantial variation in the extent to which they do so.

Acknowledgements

This study is part of the Breed4Food project Ethics & Society, financially supported by the Dutch Ministry of Economic Affairs (TKI Agri and Food project 16022) and the Breed4Food partners Cobb Europe, CRV, Hendrix Genetics and Topigs Norsvin.

References

- Bhat, S.A., Malik, A.A., Ahmad, S.M., Shah, R.A., Ganai, N.A., Shafi, S.S. and Shabir, N. (2017). Advances in genome editing for improved animal breeding: A review. *Veterinary World*, 10:1361-1366.
- Doran, T.J., Morris, K.R., Wise, T.G., O'Neil, T.E., Cooper, C.A., Jenkins, K.A. and Tizard, M.L.V. (2018). Sex selection in layer chickens. *Animal Production Science* 58:476-480.
- Eriksson, S., Jonas, E., Rydhmer, L. and Röcklinsberg, H. (2018). Invited review: Breeding and ethical perspectives on genetically modified and genome edited cattle. *Journal of Dairy Science* 101:1-17.
- Gamborg, C. and Sandøe, P. (2005). Sustainability in farm animal breeding: A review. *Livestock Production Science*, 92:221-231.
- Greger, M. (2010). Trait selection and welfare of genetically engineered animals in agriculture. *Journal of Animal Science* 88:811-814.
- Houdebine, L.-M. (2014). Impacts of genetically modified animals on the ecosystem and human activities. *Global Bioethics* 25:3-18.
- Kramer, K. and Meijboom, F.L.B. (2021). Using breeding technologies to improve farm animal welfare: what is the ethical relevance of *telos*? *Journal of Agricultural and Environmental Ethics*. 34:2.
- Liinamo, A.E. and Neeteson, A.M.A. (2001). Sustainable breeding for farm animals: overview of ongoing research and business efforts in Europe.
- Naab, F.Z., Coles, D., Goddard, E. and Frewer, L.J. (2021). Public perceptions regarding genomic technologies applied to breeding farm animals: A qualitative study. *BioTech* 10:28.
- Olsson, I.A.S. and Sandoe, P. (2004). Ethical decisions concerning animal biotechnology: what is the role of animal welfare science? *Animal Welfare* 13:S139-144.
- Rauw, W.M., Kanis, E., Noordhuizen-Stassen, E.N. and Grommers, F.J. (1998). Undesirable side effects of selection for high production efficiency in farm animals: a review. *Livestock Production Science* 56:15-33.
- Rose, M., Everitt, J., Hedrich, H., Schofield, J., Dennis, M., Scott, E. and Griffin, G. (2013). ICLAS Working Group on Harmonization: International guidance concerning the production care and use of genetically-altered animals. *Laboratory Animals* 47:146-152.

47. The 'mise en place' for the ratatouille – Dutch (policy) developments towards an ethical management of commensal rodents

M.A.A.M. van Gerwen* and F.L.B. Meijboom

Centre for Sustainable Animal Stewardship, Department Population Health Sciences, Faculty of Veterinary Medicine, Utrecht University, Yalelaan 2, 3584 CM Utrecht, the Netherlands; m.a.a.m.vangerwen@uu.nl

Abstract

As part of a stakeholder project, we are working on animal welfare and other ethical aspects in rodent control. One of the aims of this project is to develop an assessment framework for an ethical rodent management. To build such a framework and make it operational, input from different stakeholders is valuable. Next to this, policy and regulation can play an important role towards a more ethical rodent management. In this paper, we analyse this role of policy and regulation along the lines of recent developments in the Netherlands that focus on the treatment of commensal rodents. Key developments are (1) the Integrated Pest Management (IPM) requirements for the control of rats and mice inside buildings by 2023; (2) the establishment of the governmental program 'IPM Rodent Control' with several stakeholder working groups; and (3) an advice from the Dutch Council on Animal Affairs on the killing of animals. We present and discuss these policy developments along the line of three criteria: (1) its potential to increase the attention for animal welfare in rodent management; (2) whether and how it can function as the 'mise en place' for the practical applicability of our assessment frame; and (3) to what extent it fits with comparable developments in other countries.

Keywords: animal ethics, animal welfare, rodent management

Introduction

Large numbers of commensal rats (*Rattus norvegicus* and *R. rattus*) and mice (*Mus musculus*) are killed globally because they cause damage to human property, threaten food production, or pose a threat to human and animal health. Our previous research has shown that the moral status and welfare of rats and mice remains underexposed in the practice of rodent management (van Gerwen and Meijboom, 2018). The study showed that Dutch stakeholders involved in rodent control, believe that the management of commensal rats and mice can be more animal friendly. This can be done, for example, by applying more preventive measures and paying more attention to animal welfare in the control. Together with stakeholders, we are working on drawing up a practice-oriented assessment framework for an ethical management of commensal rodents. Important questions for this framework are: (1) Where lies the acceptance threshold for commensal rodents and what factors play a role in this? (2) When is it necessary and acceptable to intervene? (3) If an intervention is necessary and acceptable, what methods should be used in what situation?

To build the framework and make it operational, input from different stakeholders is essential and therefore we studied the attitudes towards rodent welfare among professional pest controllers (Van Gerwen *et al.*, 2020) and their clients (Van Gerwen *et al.*, in preparation). Next to these dimensions, policy and regulation can play an important role in reaching this aim for an ethical rodent management. In this paper, we analyse the role of policy and regulation and discuss three recent developments in the Netherlands that can facilitate a more ethical treatment of commensal rodents. We first present and

discuss three key developments: (1) the IPM requirements from 2023 onwards; (2) the establishment of the governmental program 'IPM in rodent control' with several stakeholder working groups including on welfare; and (3) the advice from the Dutch Council on Animal Affairs (RDA, 2022) on the killing of animals, including pest animals. Next, to evaluate these developments from their ability to contribute to an ethical management of commensal rodents, we will discuss for each initiative (1) its potential to increase the attention for animal welfare in rodent management; (2) whether and how it can function as the '*mise en place*' for the practical applicability of our assessment framework; and (3) to what extent it fits with comparable developments in other countries.

Integrated Pest Management from 2023

For controlling commensal rodents, anticoagulant rodenticides are still an often-used method by pest controllers, also in the Netherlands (Buckle and Smith, 2015; Van Gerwen *et al.*, 2020). However, anticoagulants have a high negative impact on rodent welfare (Baker *et al.*, 2021) and their use is often accompanied by negative environmental consequences, such as bioaccumulation and rodenticide exposure resulting in the death of non-target species (Buckle and Smith, 2015).

Following European regulations (Regulation (EU) 528/2012, art. 19(5)), in the Netherlands the use of anticoagulant rodenticides requires a certification for Integrated Pest Management (IPM) for the control of rats outside buildings since 2017 (Ctgb, 2022). The objective of IPM is to minimize the use of anticoagulants by preventing rat and mouse infestations as much as possible in the first place. Prevention covers measures such as sealing off holes in buildings, storing food and animal feed in rodent-proof containers, proper recycling of waste and cleaning up food spills. In the case prevention does not function properly, non-chemical methods (e.g. snap traps) should be used before chemical methods (e.g. anticoagulant rodenticides and cholecalciferol). From 2023 onwards, the IPM approach will also become mandatory for the control of rats and mice indoors (Ctgb, 2022). This means that private persons are no longer allowed to use these types of rodenticides for controlling rats or mice. Only IPM-licensed professionals are.

National program IPM Rodent Control

In 2019 the Dutch National Institute for Public Health and the Environment (RIVM) published the report 'Sustainable and effective rodent control, an exploratory study into effectiveness and optimization of integrated rodent control' (Komen *et al.*, 2019). The report, based on various stakeholder consultations, describes bottlenecks and possible solutions to ensure that the policy for controlling rodents is as effective as possible. It also highlights the importance of animal welfare and environmental impact of chemical methods. The findings of the report are in line with the findings of our stakeholder consultation earlier (Van Gerwen and Meijboom, 2018).

One of the improvements mentioned in both Komen *et al.* (2019) and Van Gerwen and Meijboom (2018) is a better National coordination of rodent management. In the Netherlands, four ministries are involved in rodent management policy, and provinces and municipalities also have an important role to play. Many stakeholders experience a lack of clarity about the roles and responsibilities of the various authorities (Komen *et al.*, 2019). More clarity about roles and responsibilities and possibly a central point of contact help to determine who should take control for which subject. As a response to the improvements suggested, the Dutch government organized a working group with stakeholders in 2020 and, based on that, started the program IPM Rodent Control (*IPM Knaagdierbeheersing* in Dutch) in 2021.

Section 5

The program has a duration of 4 years (2021-2024) and covers 5 different working groups in which stakeholders are represented. The four ministries are represented both within the working groups and the steering committee of the program. The policy goal to which the program must contribute is 'a sustainable and effective rodent control, which is also experienced as such'. Sustainable is defined by three aspects: (1) structurally no or as little as possible residues of chemical agents in the environment; (2) no or as little as possible development of resistance to chemical methods by rats and mice; and (3) no or as little suffering as possible of rats and mice or non-target animals. Effective is defined by four aspects: (1) no unacceptable nuisance from pests; (2) no uncontrollable pests; (3) no negative effects on ecosystems; and (4) reducing the risk of spreading pathogens in and between humans and animals.

In the working groups stakeholders work on different themes that are connected to integrated rodent management. They carry out explorative studies and propose ideas for research and improvements in both practice and policy. The following working groups are part of the program: (1) legislation and the education of pest controllers; (2) communication and education, with a focus on citizens, municipalities, and various professional sectors; (3) prevention, habitat management and spatial planning in both urban and rural areas; (4) chemical and non-chemical methods, with focus on effectiveness, environmental impact and animal welfare; and (5) monitoring of rodent pests, to get more insight into the development of rat populations over time.

Advice on the killing of animals by the Dutch Council for Animal Affairs

The Council on Animal Affairs (RDA) is an independent council of forty experts with diverse backgrounds and expertise. It advises the Dutch Minister of Agriculture, Nature, and Food Quality on multidisciplinary issues in the field of animal welfare, including animal health and ethical issues. In 2022 the Council issued the advice on the killing of animals. The questions that were central to this advice were why killing animals and how it is justified or not. It also looked at which aspects of animal welfare and social concerns play a role when it comes to killing animals. The view distinguishes between different reasons for which animals are killed. One of those reasons is because animals cause nuisance. For this specific theme, the Council has developed an assessment framework that makes the choices more transparent and ethical. The framework can help to make careful considerations about tackling animal nuisance and to harmonize decision-making nationally. It is a first version of a general assessment framework, with examples given for mammals and birds, that must be further elaborated by experts per sector or per animal group.

In this framework the intrinsic value of animals is recognized and therefore, a 'no, unless' principle is adopted: animals are not killed, unless there are serious barriers to choosing non-lethal methods. Besides the recognition of the intrinsic value, the justification for an intervention (by means of non-lethal methods) must be provided by formulating a SMART-formulated goal for a possible intervention. If the goal is justified, an approach that does not kill animals should be chosen first. Only when the non-lethal approach is not sufficient, it is allowed to kill animals. Animal welfare must also be considered in every decision. The Council states in its advice that the framework should be completed with theoretical and practical expertise to arrive at a suitable approach, ideally in collaboration with all parties that play a role. It is important that there is support for the approach among those involved. It is therefore necessary to communicate with all parties at all steps, with a communication plan as a guideline. In the example of pigeon nuisance, a municipality can, for example, initiate a conversation between knowledge holders, the housing associations, residents, and other stakeholders (e.g. entrepreneurs). Together they can choose a control method that all parties accept.

Contributions to a more ethical rodent management

Potential for commensal rodent welfare

The three developments mentioned can have a positive effect on commensal rodent welfare in the Netherlands in various ways. First, the goal of the IPM requirements is to lower the general use of rodenticides. As rodenticides are classified as a method with a high impact on rodent welfare by both scientists (Cartuyvels *et al.*, 2021; Baker *et al.*, 2022) and Dutch pest controllers (Van Gerwen *et al.*, 2020), a decreased use may benefit the welfare of commensal rodents.

A direct effect of the IPM regulations is that private persons are no longer allowed to use rodenticides for controlling rats and mice. The question remains however, what methods these persons will use from 2023 onwards. It can be the case that they will sooner ask for the help of a professional pest controller or a municipality, but they may also look for alternative methods, with high welfare impacts, that are for sale in (web)shops. The IPM requirements create however openings to start thinking about what methods to use when, where and by whom and to consider factors such as environment, effectiveness, and animal welfare for all control methods. The studies of Cartuyvels *et al.* (2021) and Baker *et al.* (2022) provide the first steps for doing so.

In the governmental program, animal welfare is included as an important factor to consider when controlling rodents and developing and choosing methods. One of the working groups looks deeper into this topic, will formulate future research questions, and wants to work on a decision tree for decisions about what method to use when, based on effectiveness, impact on the environment or non-target species and impact on rodent welfare. In this way, animal welfare will become a factor to incorporate in rodent management. Another working group focusses on communication and information. This working group will also pay attention to the education of private persons on how to better prevent rat and mouse infestations and how to control them in a more animal friendly manner.

Finally, the Dutch Council for Animal Affairs puts the interests (among which animal welfare) of pest animals on central position by taking the acknowledgement of the intrinsic value as a starting point in its advice on the killing of pest animals.

Relevance for the assessment framework

The developments in the IPM Rodent Control program and the advice from the Dutch Council on Animal Affairs form an important basis for the assessment framework for an ethical rodent management. As the Council indicates, it is important to determine whether there is rodent nuisance, to what extent and whether that nuisance also constitutes a reason for intervention. These questions have not been further elaborated on by the Council and it advises that this must be answered per situation and with cooperation of different stakeholders. It is therefore necessary to formulate a clear objective to which intervention, if necessary, must lead. The working group that focuses on different control methods within the IPM Rodent Control program also considers which method to use and when, and similar questions arise. The central remaining question for both the governmental program and the Council is where the acceptance threshold for rodent nuisance lies.

In the assessment framework we are working on, the acceptance threshold is an important aspect we want to look into. We want to investigate: (1) where the acceptance threshold for commensal rodents lies and what factors play a role in this. Besides the threshold level; (2) we want to identify several practical situations in which it is necessary and acceptable to intervene; and finally, (3) we want to provide insights in what method to use when.

Section 5

IPM requirements function already as a step-by-step approach or framework with prevention as a starting point. It can thus provide an infrastructure in which animal welfare and other moral aspects can be integrated.

International developments

The approach used for the IPM Rodent Control program and that underlying the activities of the Council on Animal Affairs, is typical to the Netherlands and can be referred to as the Dutch 'polder model' for decision making. This entails a process that focuses on achieving consensus and involves various stakeholders to include different interests and diversity of knowledge and expertise. The approach can provide broader and future-proof solutions because the various parties involved all develop a sense of ownership of the matter. On the other hand, it is also an approach that takes a lot of time and often leads to small steps forward. Although this approach seems typical Dutch, the attention to animal welfare and rodent control are not specific for the Netherlands. In different EU countries, among which the United Kingdom, Germany and Belgium, and on EU-level there are relevant developments taking place. By Cartuyvels *et al.* (2021) these developments are also briefly described. One of them is development of a certification system for rodent traps by the German Environment Agency (Umwelt Bundesamt) on behalf of the European Commission. The traps will be tested for their animal friendliness and their effectiveness. As part of this system a guidance document for the evaluation of break back/snap traps is published (Schlötzelburg *et al.*, 2021). The report describes the assessment of the animal welfare impact and the efficacy of rodent break back/snap traps and provides norms which could be used for certification.

In Flanders (Belgium) in 2021 the COHBRAM-project (Code van goede praktijk voor de humane bestrijding van ratten en muizen / Code of good practice for humane control of rats and mice) was completed. This project was initiated by the Animal Welfare Service of the Environment Department of the Flemish government and executed by the Research Institute for Nature and Forest. As part of the project a study, consisting of a literature review and an expert consultation, was performed about the welfare implication of different rodent control methods (Cartuyvels *et al.*, 2021) that resulted in a guidance document for animal friendly control of rats and mice. Furthermore, an online decision tool and an informative flyer for both lay persons and municipalities were developed (INBO, 2021).

Also in 2021, a Glue Traps (Offences) Bill has been introduced in the UK Parliament and was backed by the UK Government (UK Government., 2021). The Bill enables a full ban on the use of glue traps to catch rodents. The authorities in England, Scotland and Wales are now considering bans or significant restrictions on the use of glue traps. In several other countries including New Zealand, Ireland and India glue traps are already forbidden (UFAW, 2022).

Conclusions

In this paper three different policy and regulation developments that can facilitate a more ethical treatment of commensal rodents in the Netherlands were identified. The developments are in line with improvements suggested earlier by stakeholders involved in rodent control and ongoing international developments. They have the potential to function as a three step '*mise-en-place*' or preparation for the eventual assessment framework to be implemented in practice. First, the IPM requirements provide an infrastructure in which the framework can function and take its place. Second, the advice by the Council on Animal Affairs sketches a basic version of the framework. Third, the program IPM Rodent Control facilitates dialogue and a consensus approach which may contribute in its turn to a broad support and better practical implementation of the framework.

References

- Baker, S.E.; Ayers, M.; Beausoleil, N.J.; Belmain, S.R.; Berdoy, M.; Buckle, A.P.; Cagienard, C.; Cowan, D.; Fearn-Daglish, J.; Goddard, P.; Golledge, H.D.R.; Mullineaux, E.; Sharp, T.; Simmons, A. and Schmolz, E. An assessment of animal welfare impacts in wild Norway rat (*Rattus norvegicus*) management. *Animal Welfare*, 2022, 31: 51-68. <https://doi.org/10.7120/09627286.31.1.005>.
- Buckle, A.P. and Smith, R. H. (2015). *Rodent Pests and their Control*, 2nd edition. Oxfordshire: CABI.
- Cartuyvels E., De Ruyver C., Huysentruyt F., Leirs H., Moons C., Van Den Berge K., Baert K. (2021). Gids voor de Diervriendelijke Bestrijding van Ratten en Muizen. Rapporten van het Instituut voor Natuur- en Bosonderzoek 2021 (26). Instituut voor Natuur- en Bosonderzoek, Brussel. <https://doi.org/10.21436/inbor.36326893>.
- Ctgb (Dutch Board for the Authorisation of Plant Protection Products and Biocides). Available at: <https://www.ctgb.nl/onderwerpen/rodenticiden>.
- INBO, 2021. News item from the Research Institute for Nature and Forest (INBO) in Flanders. November 2021. Available at: <https://www.vlaanderen.be/inbo/nieuwsbrief-november-2021/diervriendelijke-bestrijding-van-ratten-en-muizen/>.
- Komen, C.M.D.; Scheepmaker, J.W.A.; Wezenbeek, J.M. 2019. Duurzame en effectieve knaagdierbeheersing. Verkennd onderzoek effectiviteit en optimalisatie geïntegreerde knaagdierbeheersing. Rijksinstituut voor Volksgezondheid en Milieu. RIVM Rapport 2019-0179. <https://doi.org/10.21945/RIVM-2019-0179>.
- Schlötterburg, A.; Geduhn, A.; Schmolz, E.; Friesen, A., Baker, S.; Martenson, N.; Le Laidier, G.; Urzinger, M.; Klute, O.; Schröer, D.; Brigham, A. and Puschmann, M. 2021. NoCheRo-Guidance for the Evaluation of Rodent Traps. Part A Break back/Snap traps. German Environment Agency, 74/2021.
- RDA, 2022. Doden van dieren aan het licht. Verschuivende visies, veranderende discussies. Advice from the Dutch Council on Animal Affairs (RDA, Raad voor Dierenaangelegenheden) on the killing of animals.
- Van Gerwen, M.A.A.M.; Meijboom, F.L.B. The Black Box of rodents perceived as pests: On inconsistencies, lack of knowledge and a moral mirror. In *Professionals in Food Chains*; Springer, S., Grimm, H., Eds.; Wageningen Academic Publishers: Wageningen, The Netherlands, 2018; pp. 392-397.
- Van Gerwen, M.A.A.M.; Nieuwland, J.; van Lith, H. A. and Meijboom, F. L. B. (2020). Dilemmas in the Management of Liminal Rodents – Attitudes of Dutch Pest Controllers. *Animals Open Access Journals*, 10(9), 20. <https://doi.org/10.3390/ani10091614>.
- UFAW, 2022. Humane Rodent Control, Universities Federation for Animal Welfare. Available at: <https://www.ufaw.org.uk/rodent-control/rodent-control>.
- UK Government, 2021. Press Release: Government backs Bill banning the use of glue traps for pest control. Department for Environment, Food & Rural Affairs. Available at: <https://www.gov.uk/government/news/government-backs-bill-banning-the-use-of-glue-traps-for-pest-control>.

Section 6.

Veterinary practice and ethics

48. Learning to kill – how veterinarians reflect their learning process

M.J. Bubeck

Department of Sociology, LMU Munich, Konradstraße 6, 80801 Munich, Germany;
 m.bubeck@soziologie.uni-muenchen.de

Abstract

To kill an animal ‘humanely’ is a common task in everyday veterinary medicine, yet it is a challenging one – especially for novice practitioners. Veterinary ethics and veterinary educational studies focus on the topic of end-of-life decisions, particularly euthanasia. This paper analyses how veterinarians reflect their learning processes concerning the killing of an animal. Using a Grounded Theory approach, eight veterinarians with different specialisations and varying experience in the work field have been interviewed with special attention to how they have experienced their first time killing an animal – as in seeing and later performing the killing themselves. In their reflections, ‘to euthanize’ an animal is a ‘personal matter’, that cannot only be learnt theoretically, but must be practiced in the field. In addition, it is an experience that may differ greatly from one euthanasia to the next. As reconstructed from the interviews, euthanasia shows itself to be a complex situation that requires knowledge, skills, and one’s own personal approach. For this, veterinarians use different learning strategies. One is to focus on how to behave (seeing) and on the practices (doing). Legitimizing the killing in method and reason is part of the professional self-understanding. This paper shows how veterinarians frame their experiences inclusive ethical questions themselves and can thus contribute to an empirical grounded discussion about ethical education.

Keywords: euthanasia, veterinary education, qualitative inquiry, veterinary ethics

Introduction: ‘A case that has remained very much in my memory’ (Dr Bauer)

Killing animals is an important task of the veterinarian profession. What this means and how it is done exactly depends on the veterinarian context and is ambivalently discussed both in the profession and in society (Deelen and Meijboom 2021; Dürr *et al.*, 2011). Euthanasia can for example be seen as one of the profession’s profound privileges, which is viewed to bring relief to animals and clients alike (e.g. in contrast to human medicine in Germany, where euthanasia is illegal), but it can also be a major ethical and emotional burden. Sometimes veterinarians even refuse to perform euthanasia for moral reasons (Yeats and Main, 2011). In empirical research, veterinarians describe it as an intensely stressful (Dickinson *et al.*, 2011; Knesel *et al.*, 2017) or even as a severe moral dilemma situation, as for example in small animal practices (Hartnack *et al.*, 2016). It is associated with moral stress and even with burnout and a higher suicide risk for professionals (Batchelor and McKeegan, 2012; Glaesmer *et al.*, 2021; Platt *et al.*, 2012; Rollin 2011).

But how is killing an animal addressed in veterinary education? End-of-life issues (EoL: dying, death and bereavements) are important topics for studying veterinary medicine (Cohen-Salter *et al.*, 2004; Dickinson, 2019; Littlewood *et al.*, 2018). An empirical study shows that 51% of the participating small animal veterinarians in the US had received ethics training (Kipperman *et al.*, 2018), but only 39% found it helpful in clinical situations. Paradoxically, the majority also agreed to modifications on veterinary school curricula to address ethical education and awareness of moral stress and burnout. A recent study shows that most schools in the UK and the US offer training in EoL issues (over 96%) such as ‘euthanasia’, ‘analgesics for chronic pain’, and ‘communication with owners of dying animals’ (Dickinson, 2019). The average number of hours spent on EoL issues is 7 (US) and 21 (UK). The

Section 6

author of that study recommends addressing the veterinary medicine students' feelings regarding dying and death from the beginning of their studies and throughout class activities as well as clinical work.

In a recent paper focusing on euthanasia (Persson *et al.*, 2020), the killing of animals is described as an ethical problem. One aspect in this discussion is the difference between the veterinarians' personal morality on the one hand and legal as well as organizational requirements or expectations on the other hand (e. g. guidelines). They argue that a 'lack of awareness for underlying philosophical assumptions regarding possible understandings of euthanasia' (ibid., p. 1) is the central issue. Due to ethical aspects of killing animals, ethical education is a growing field in veterinarian schools in Germany (Thöne-Reineke *et al.*, 2020).

But how does this manifest empirically? And how do veterinarians reflect their practical education concerning the act of killing? Killing an animal is a multi-dimensional issue. It has a practical dimension (Littlewood *et al.*, 2018) as well as an emotional, psychological, economic, and ethical dimension (Parsson *et al.*, 2020). Therefore, I examine the various dimensions of narrations of the first time killing an animal by veterinarians themselves. I focus on the veterinarians' expectations and legitimations of the killing. Due to the special learning situation, other dimensions such as client-communication (emotional work) and decision making are part of further killing cases and can't be explored in this paper.

This papers analyses what happens when veterinarians 'are thrown into the situation' (Vet Treiber, pos. 170-171) and how they narrate how they learned to kill. Its goal is to enable an empirically based discussion about ethical learning and teaching in veterinary education.

Methods

This paper is part of an empirical investigation of killing animals in veterinary medicine in Germany. Currently, the sample consists of 13 semi-structured interviews with veterinarians in different fields (small animal, large animal, equestrian medicine, laboratory facilities and the slaughterhouse) as well as a document analysis (guidelines, homepages), with the latter not discussed in this paper. The research follows a Grounded Theory approach (Charmaz, 2014). Its aim is to describe the multi-contextuality of killing in veterinary medicine and its entanglements with the professionalism. This approach is used because of its iterative-circular research process and ability to build an empirically based theory. This method is well established in health research and has already been used to study veterinary medicine (Morris, 2012, Vermilya, 2015; for a literature review see also Bonnaud and Franté, 2021)

In the research process interviews were gradually collected in a theoretical sample process from 2020 onwards. Acquis was a mixture of snowball system and active request (e-mail, lists/groups, Instagram). Due to the pandemic situation, the interviews were conducted via video telegraphy and lasted between 45 and 90 minutes. The focus lay on the aspect of killing animals in the interviewees' professional work and included questions about their professional biography and perspectives on the veterinary medicine in general. The interviewer is a trained sociologist and veterinarian himself. Interviews were recorded and transcribed. For analysis, the software MAXQDA was used. Passages that include narrations about the first time killing an animal of 8 veterinarians were analysed for this paper. The veterinarians differ in the fields in which they work as well as in their socio-demographic data concerning professional experience (0-25 years), spatial situation (rural – urban), and gender (6 female).

The first time *Seeing*: 'It is always impressive when you observe it for the first time' (Dr Bauer)

Among the first memories of situations, in which animals were killed, are experiences surrounding euthanasia. Some of the interviewees (3) share memories of how their own animals were 'put to sleep' (esp. dogs and horses). One participant described it as a 'turning point' when his dog had to be euthanized while he was already in college.

No, I don't know for sure anymore. That is now blurred in my memory. I can remember how I had to – my own dog, I was already in college then – take [him] to the vet. (1)
 Uh, the dog was 15, I was 30. Um, of course it was a turning point. Um, that was but (1)
 uh it was also good. (Dr Kaufmann, pos. 433-437)

The ambivalent structure of the narratives stands out: The situation is described both as 'emotional', 'impressive' (Dr Bauer, pos. 523) or even 'extreme' and 'dramatizing' (Dr Müller, pos. 741), as well as 'normal' and 'good' (Dr Kaufmann, pos. 473). One veterinarian even described it as 'idyllic' (Dr Maurer, pos. 501), because the downer cattle lay between trees on a meadow. Most of the participants don't provide a detailed narration of the concrete situation, as they can remember the context but little information of the clinical case or the practical dimension:

So, of course, it was, yes, it is always impressive when you observe it for the first time. But um, (1) I can't remember now that I could somehow say that it would have been one way or the other. (Dr Bauer, pos. 522-526)

The first experiences of killing are often made in curative internships with euthanasia, either while still in school for career orientation (2) or as part of their studies (4), especially in the context of a 'small curative internship' (*kleines kuratives Praktikum*, TappV).

There is one special case in the sample in which there is no recollection of the first killing at all. This interviewee's father is a veterinarian, too; she has been in his veterinary practice since her childhood:

No, honestly, I don't know anymore. Because I have already as a (1) child been with him at the veterinary practice all the time. Not helping but (1) just (1) watched (1) and I found it simply (1) interesting. (1) Uh and (2) yes, then (1) I did not do it myself (1) but I just saw it (1) (Vet Reuter, pos. 442-446)

Here, another distinction becomes clear: one between *seeing* and *doing*. The first encounter is primarily about getting to know the situation. The veterinarian remembers how she was prepared for the situation by the vet: 'how I should behave' (Vet Treiber, pos. 167). She was told to stay in the background and observe, and not to participate actively. Another remembers how she was practically engaged in the situation by the vet: 'exactly, I was immediately assisting the vet and was allowed to listen to the heart again' (Dr Bauer, pos. 512-513). In their reflection of the learning situation, most of the interviewees showed that they learned by seeing how to provide a professional killing – especially regarding attitudes through legitimization of the killing, as will be shown later.

The first time *Doing*: 'It isn't a negative memory. I was so busy with practical things' (Dr Maurer)

In the narration of the first time *doing* the killing, all participants make clear that their focus lay on the practical dimension. Vet Treiber, for example, shows in her account how she placed the cannula with the help of an experienced assistant:

And then came a veterinary assistant with whom I worked well together, and she talked through the steps with me. Then I placed the cannula – which worked right away, which is not always the case. And it felt somehow good for the overall situation that I had the feeling that (1) I can do it because this is the most difficult part.

(Vet Treiber, pos. 339-344)

'Doing it correctly' (Vet Reuter, pos. 471-472), as another interviewee puts it, was in the common interest when killing for the first time. The objectives are to place a cannula 'correctly' and 'securing' access for the medication, even though different techniques are used (e.g. through a vein or intracardial). One's own feelings for/with the animal were of less importance.

I didn't feel very (1) emotional about the animal I'm going to kill now. (1) But I found it rather difficult (1) to do it correctly, (1) to hit the heart right. (ibid.)

The situation is somewhat different for a veterinarian who had her first experience in a research institute. She constructs a distinction between passive and active killing. For her, only the 'active' killing (via cervical dislocation) counts as the first time:

I mean, the CO₂ killing is something passive. You forgot the mice and you don't interact with them actively. Yes, you have nothing to do with them. You just pressed the button, but you don't have to actively kill them yourself. (...) And it was in my training back then, (...) that was my (1) first mouse that I actively killed. (Dr Müller, pos. 794-801)

Unlike *seeing*, the veterinarians have a good recollection about practical details. They focus on practical dimensions of the killing, which means working hands-on with the animals and perform the act 'correctly'. Due to the learning situation, they were able to leave aside other dimensions of the killing work, e.g. client-communication and decision making, or even the management of (their own) feelings.

Legitimation: 'It is a privilege for us vets, that we (...) are able to assume this responsibility' (Vet Treiber)

To kill an animal is a multi-dimensional act and requires different skills: practical, communicational, ethical. The first instance of killing (*seeing* and *doing*) can be described as a 'special moment' (Vet Treiber, pos. 308), but also an 'extreme situation' (Dr Bauer, pos. 507). But how do veterinarians reflect their learning experiences in an ethical dimension?

Though the situations (small animal, equine practice), places (veterinarian practice or clinic, stable, home of the clients), animals (horses, dogs, cats, mice), and settings (an institution for addicts, a riding stable with an audience, a laboratory) differ, most cases have been in a curative setting and were viewed as 'euthanasia'. In all cases, the killing was described as 'necessary' (Dr Bauer, pos. 519; Dr Maurer, pos. 707) and 'right' (Dr Kaufmann, pos. 439) or as being performed with 'humane' (Dr Müller, pos. 818) methods. This shows that the veterinarians commit to a narrow definition of euthanasia (Ach, 2018).

The methods are legal and according to ‘animal welfare’ standards, e.g. cervical dislocation vs. CO₂ killing of mice (Dr Müller, pos. 818). The veterinarians legitimize some of these methods with medical reasons like the intracardial injection for an animal whose ‘blood pressure is already so bad’ (Vet Reuter, pos. 466). But even when the methods are not remembered or questioned (‘Somehow I didn’t really question that.’), they were expected by the veterinarians to follow the dictum of ‘[it] was certainly fine’ (Dr Müller, pos. 757).

But that’s what has stayed in my head the most is concerning killing animals. But that, (1) I mean, you are only allowed to kill an animal when there are reasonable grounds. And the horse has a phlegmon and had to be killed. And the method (1) was certainly fine. Even I, um, don’t know what they have done exactly. (Dr Müller, pos. 753-759)

In this passage lies the second part of the legitimization strategy: ‘when there are reasonable grounds.’ The animals ‘had to be euthanized’ because of health problems (here ‘phlegmon, an acute (colic) or chronic illness (kidney disease) often linked to age) and/or a failed treatment. One interviewee discusses how the veterinarian explains her case – not only in a clinical sense but also as an ethical decision:

She [the vet; M.B.] explained the case to me (...) and (...) justified why we do this so that the dog... He was somehow chronically ill and no longer had a life worth living. And that there was a longer medical history and there is no therapy available. (...) I know that it definitely is a decision she stands behind. (Vet Treiber, pos. 160-166)

To the veterinarians, the ethical dimension of killing an animal seems to be obvious. They point to uniqueness, the ‘ultimacy’ of the decision: ‘you can’t undo the decision you make’ (Dr Bauer, pos. 551-552) – both in relation to the life that they end as well as to their professional self, as I will show in my conclusion.

Conclusion: ‘Euthanasia is a very personal matter’ (Vet Treiber)

Euthanasia is a personal matter not only for clients, but also for veterinarians themselves. Therefore, this paper has explored how veterinarians narrated their first time killing an animal (*seeing* and *doing*). Their narrations focus on the practical aspect of it and are embedded in normative legitimations. Dr Müller, who worked in a laboratory, describes a short situation, in which she experienced a ‘barrier in my head’ (pos. 804) because she didn’t want to do the killing. After a short hesitation she decided to do it anyway: ‘It was just a short moment that I thought: Will I really do this? And yes, then it was already done’ (pos. 818-820). This short moment of indecisiveness is linked to the ultimacy of the situation:

And at that moment when I killed the mouse, I thought to myself: Yes, but now I can’t go back. Now I’ve killed a mouse, there is no going back. Now I’ve killed a mouse if I killed it. (Dr Müller pos. 810-813)

For her it was a question of being suitable for ‘mouse-work’ (pos. 816), which means working in a laboratory. But it even goes beyond that. In the professional self-understanding killing is part of the professional work. And this is also seen from the outside. Another interviewee narrates the question of other people asking her how she is capable of ‘euthaniz[ing]’ (Vet Treiber, pos. 311) an animal. But for her ‘this was never a problem’ (ibid.). The possibility to kill an animal in its assumed interest, i.e. to end its suffering, is seen as a privilege of the profession: ‘a privilege of us veterinarians that we can end a life that is no longer worth living’ (ibid., pos. 313-314).

Section 6

In further research, the learning of killing should be investigated in the following terms: How do the dimensions of killing interplay? When are the legitimization strategies learned? How veterinarians learn to kill in other fields (slaughter, animal disease control) must be investigated separately as well.

The findings regarding the narrations of their 'killing-biography' suggest that vets first learn and incorporate ethical perspectives and to no less extent legitimization strategies before they do the decision-making surrounding killing on their own. Thus, one may draw from this empirical analysis the desire to implement ethical education into veterinary studies from early on (Dickinson, 2019, Thöne-Reineke, 2020).

References

- Ach, J.C. (2018). Euthanasie. In: Ach, J.C. and Borschers D. (ed.): *Handbuch Tierethik: Grundlagen – Kontexte – Perspektiven*. J.B. Metzler Stuttgart, Germany, pp. 238-241.
- Batchelor, C.E. and McKeegan, D.E. (2012). Survey of frequency and perceived stressfulness of ethical dilemmas encountered in UK veterinary practice. *Veterinary Record* 170(1): 19.
- Bonnaud, L. and Fortané N. (2021). Being a vet: The veterinary profession in social science research. *Review of Agricultural, Food and Environmental Studies* 102: 125-149.
- Charmaz, K. (2014). *Constructing Grounded Theory*. SAGE, London, UK, 416 pp.
- Cohen-Salter, C., Folmer-Brown, S., Hogrefe, K. M. and Brosnahan, M. (2004). A model euthanasia workshop: One class' experience at Tufts University. *Journal of Veterinary Medical Education* 31(1): 73-76.
- Deelen, E. and Meijboom, F.l.b. (2021). 38. Killing in plural? On animal life assessments by veterinarians and the role of euthanasia. In: Schübel, H. and Wallimann-Helmer, I. (ed.) *Justice and food security in a changing climate*. Wageningen Academic Publishers, The Netherlands, pp. 255-260.
- Dickinson, G.E., Roof, P.D. and Roof, K.W. (2011). A survey of veterinarians in the US: Euthanasia and other end-of-life issues. *Anthrozoos* 24(2): 167-174.
- Dickinson, G.E. (2019). US and UK veterinary medicine schools: emphasis on end-of-life issues. *Mortality* 24(1): 61-71.
- Dürr, S., Fahrion, A., Doherr, M.G., Grimm, H. and Hartnack, S. (2011). Akzeptanz des Tötens von Tieren: Umfrage bei Tierärzten und anderen Berufsgruppen. *Schweizer Archiv für Tierheilkunde* 153(5): 215-22.
- Hartnack, S., Springer, S., Pittavino, M. and Grimm, H. (2016). Attitudes of Austrian veterinarians toward euthanasia in small animal practice: Impacts of age and gender on views on euthanasia. *BMC Veterinary Research* 12: 1-14.
- Glaesmer, H., Bahramsoltani, M., Schwerdtfeger, K. and Spangenberg, L (2021). Euthanasia distress and fearlessness about death in German veterinarians. *Crisis* 42(1): 1-7.
- Kipperman, B., Morris, P. and Rollin, B. (2018). Ethical dilemmas encountered by small animal veterinarians: characterisation, responses, consequences and beliefs regarding euthanasia. *Veterinary Record* 182(19): 1-11.
- Knesl, O., Hart, B.L., Fine, A.H., Cooper, L., Patterson-Kane, E., Houlihan, K.E. and Anthony, R. (2017). Veterinarians and humane endings: When is it the right time to euthanize a companion animal? *Frontiers in Veterinary Science*: 1-7.
- Morris, P. (2012). *Blue juice: Euthanasia in veterinary medicine*. Temple University Press, Philadelphia, USA, 230 pp.
- Persson, K., Selter, F., Neitzke, G. and Kunzmann, P. (2020). Philosophy of a 'good death' in small animals and consequences for euthanasia in animal law and veterinary practice. *Animals* 10 (1): 1-14.
- Platt, B., Hawton, K., Simkin, S. and Mellanby, R.J. (2012). Suicidal behaviour and psychosocial problems in veterinary surgeons: A systematic review. *Social Psychiatry and Psychiatric Epidemiology* 47: 223-240.
- Rollin, B.E. (2011). Euthanasia, moral stress, and chronic illness in veterinary medicine. *Veterinary Clinics of North America: Small Animal Practice* 41, 651-658.
- TAppV. Verordnung zur Approbation von Tierärztinnen und Tierärzten. Available at: <https://www.gesetze-im-internet.de/tappv/>.
- Thöne-Reineke, C., Hartnack, S., Kunzmann, P., Grimm, H. and Weich, K. (2020). Veterinärmedizinische Ethik in der universitären Lehre im deutschsprachigen Raum. *Berliner und Münchner Tierärztliche Wochenschrift* 133: 207-211.

- Vermilya, J.R. (2015). Tracking 'large' or 'small': Boundaries and their consequences for veterinary students within the tracking system. University of Colorado, Boulder, USA, 173 pp. Available at: https://scholar.colorado.edu/concern/graduate_thesis_or_dissertations/08612n63v.
- Yeates, J.W. and Main, D.C. (2011): Veterinary opinions on refusing euthanasia: justifications and philosophical frameworks. *Vet Rec* 168 (10): 263-267.

49. Challenges of future vets – the impact of the killing of animals during education on veterinary students' wellbeing

E. Deelen^{1*}, L.F.E. Smolders¹, T.J. Tobias² and F.L.B. Meijboom¹

¹Faculty of Veterinary Medicine, Department of Population Health Sciences, Unit of Animals in Science and Society, Sustainable Animal Stewardship, Utrecht University, Yalelaan 2, 3584 CM Utrecht, the Netherlands; ²Faculty of Veterinary Medicine, Department of Population Health Sciences, Unit of Farm Animal Health, Utrecht University, Yalelaan 7, 3584 CL Utrecht, the Netherlands; e.deelen@uu.nl

Abstract

End-of-animal life (EOL) situations are a common phenomenon in veterinary practice. These EOL situations can lead to distress for the veterinarian when an ethical dilemma or conflict arises. This distress can have an impact on the personal and professional well-being of veterinary professionals. Such distress may already be present when veterinary students gain their first experience with ending an animal's life in an educational setting. To study this claim, we set up an explorative study focussing on: (1) how veterinary students experience the ending of an animal's life during an obligatory course; and (2) the impact of their experience on their wellbeing. Qualitative data were gathered via semi-structured interviews with twelve students. Template analysis was used to determine themes within the interview transcripts. The data reveal that students' previous experiences with EOL situations were predominantly influenced by the student's perspective on the motive of the owner, the bond with the animal, and the procedure. Students shared that their experience with ending an animal's life during the course was mainly influenced by the health status of the animal, the bond with the animal, the procedure, and the learning environment. We observed that depending on the dynamic of these aspects a positive or negative impact on the well-being of the student is noticed during or shortly after the course. Based on this study we have more knowledge on what factors affect a student's experience with an EOL situation and how this can affect the student's well-being. These insights can be of added value in developing or evaluating veterinary education on EOL situations.

Keywords: veterinary ethics, end-of-animal life, moral distress

Introduction

Veterinarians face end-of-animal life (EOL) situations frequently. Both the decision-making process and the act of ending animals' life, may come with (ethical) questions. One can think of questions such as how to deal with the conflicting interests of the animal and the animal owner. In some cases, these questions result in an ethical conflict or dilemma for the veterinarian. Previous research shows that facing EOL-related ethical issues is stressful for veterinary professionals and has negative implications for the personal and professional well-being of the veterinarian (Batchelor and McKeegan, 2012). Veterinary students encounter EOL situations as well. An important difference with practitioners is that students are part of a formalized curriculum and learn under supervision. As such, the formal responsibility is assigned to the supervisor. Still, moral distress can be present in veterinary students who are confronted with the ending of animal lives. Herzog *et al.* (1989) showed that veterinary students' reaction to euthanasia of animals varies. Where some students claimed that they could cope with their emotions when euthanising an animal, others were struggling with it. Students indicated that the context in which euthanasia was performed influenced their moral evaluation. Ending the life of an unwanted healthy animal was unethical in the students' perspectives, whereas killing an incurably ill animal was seen as humane. Morris (2012) showed that euthanasia was identified as presenting some of the most challenging

aspects of the internship by most veterinary students. Regarding ethical decision-making, signs of stress such as feelings of guilt and frustration were reported. Although moral distress is present in veterinary students, it remains unclear what aspects underly this moral distress in an educational setting. We, therefore, set up an explorative qualitative study focussing on: (1) how veterinary students experience the EOL during an obligatory course; and (2) the impact of their experience on their wellbeing.

Materials and methods

Study design

A study was performed, over two months (summer 2021) in which master's students in veterinary medicine were experiencing an EOL situation as part of an obligatory course in the Master's program of the Faculty of Veterinary Medicine of Utrecht University. For reasons of feasibility, only students with a specialization in the healthcare of companion animals were included. The study comprised of a questionnaire and a semi-structured interview in the week before the course (*intake interview*) and a semi-structured interview in the week after the course (*post-interview*), i.e. each student was interviewed twice.

EOL situation

During the obligatory course, students learn to relate pathophysiological processes in mammals to the course of clinical signs and gross findings at post-mortem examination. For this purpose, diseased weaner piglets from a field farm are purchased and brought to the University. Clinical signs are followed up for four days and, on day four, the students end the life of the piglet under the teacher's supervision. Piglets are treated in case of pain or to ensure survival to day four. Pigs may be euthanised before day four, in case the predefined humane endpoints (HEP) are reached and survival is no longer contributing to the learning objectives. As each student is directly involved in the ending of an animal's life in this course, it is possible to interview students about their personal experiences in a standardized educational setting. The course design and the related impact on animal welfare have been ethically evaluated and approved by the local Animal Review Board and – based on their advice, licensed by the Netherlands Central Authority for Scientific Procedures on Animals (CCD) (ref. number AVD1080020171006).

Recruitment process and study participants

Students were invited to participate in the current study four weeks before the actual course during an introductory lecture on the rotation program at the farm animal health unit. After an in-person presentation, each student received an e-mail invitation with an information letter about the study and an informed consent form. Participation was voluntary and written consent was provided by all participants before the interviews. We strived for saturation of the data by interviewing ten to fifteen students. In total twelve students participated.

Questionnaire and semi-structured interviews

Before the intake interview students received questionnaires via Qualtrics™ survey software (Version July 2021, Provo, UT, USA). The questionnaire focused on: (1) demographics including gender and birth year; and (2) multiple choice questions regarding previous experiences with EOL situations in their personal and professional lives. Shared information was used during the intake interview. Of the twenty-four interviews seven were held via video conferencing due to Covid-19 restrictions, and the remaining seventeen were held in person. Interview questions were not shared with the candidates. The interview guide of the *intake interview* focused on: (1) the students' previous experiences with euthanasia; (2) their

Section 6

opinions on the role(s) a veterinarian should take in EOL situations; and (3) and the impact students expected of ending the life of a sick animal on their well-being. The interview guide of the *post-interview* focused on: (1) the student's experience with ending the life of the piglet during the course; and (2) potential changes in their opinion on the role(s) a veterinarian should take in EOL situations. Before the start of the interview, the candidate's approval for recording the interview was asked. With the oral and written consent of the candidate, the interview started using open-ended questions. The interview approach was conversational.

Data analysis

Audio files were transcribed with Amberscript™ (Version August 2021, Amsterdam, The Netherlands). All transcripts were reviewed by the second author to ensure accuracy. Any information related to a specific person was replaced by a non-identifiable descriptor. Transcripts were explored for themes using template analysis in NVivo™ qualitative analysis software (Version Release 1.5.1, QSR International Pty Ltd. (2021)). In this form of thematic analysis, the use of hierarchical coding is emphasized but balances a highly structured process of analysing textual data with the flexibility to adjust to the needs of a study (Brooks *et al.*, 2015). A coding template for both the intake and the post-interview was developed to explore the transcripts. To define an initial coding template, open coding was used by the first author to create codes based on a subset of the transcripts. The created codes were revised and refined based on subsequent transcripts during an iterative reflective process between the authors. After this iterative reflective process, the finalized coding template was applied to the full data set. In the intake-interviews ten themes were identified. Seven themes were detected in the post-interviews. All quotes were translated and slightly edited for readability.

Results

Demographics

Of the twelve participating students, nine were female and three were male. All respondents were born in the late 1990s.

Intake interviews

Regarding the student's previous experiences, five themes were identified: (1) the motive of the owner; (2) bond with the animal; (3) procedure; (4) time; and (5) context of the euthanasia. The motive of the owner, bond with the animal, and the procedure appeared to be of main influence on the student's previous experiences and will therefore be discussed.

Students shared various previous EOL situations in which the motive of the owner to end or prolong an animal's life affected their experience. They referred to motives either as 'good' or 'acceptable' or as 'incomprehensible'. The health and welfare of the animal were of great importance to their perception. When the motive was 'incomprehensible' in the student's perception feelings of 'shock' and 'frustration' were reported. 'That was shocking when the dog's owners weren't willing to pay for surgery while a pyometra is easy to solve. That made me realise that these types of owners exist as well.'

A bond between an owner and their animal, or between the student and their animal, influenced the students' experience. A bond made their previous experiences 'more difficult'. Students described feelings of 'sadness' or 'empathic' towards owners. 'I found it difficult when the owners were crying hard. Then I couldn't always hold back my tears. You then see those owners immensely sad. I think that was the hardest part.'

Students described the procedure mostly as ‘smooth’ or ‘calm’. In case a procedure could not be performed *lege artis* or when animal signs such as gasping were present, students experienced this as ‘unpleasant’ or ‘traumatizing’. The strong emotions of the owners made the situation even more difficult for the student. Some students linked their experiences to their own learning goals. ‘When the vet needed to repeat the cervical dislocation, I thought: I must learn this properly so that I don’t end up in a similar situation. It was awful to see.’

Regarding the student’s expectations, we identified five themes: (1) health status; (2) bond with the animal; (3) procedure; (4) learning environment; and (5) support. Health status and support will be discussed as these themes were predominantly mentioned by the students.

Regarding the health status of the piglet, students expected that it would feel ‘more difficult’ to end the piglet’s life when the piglet could be cured or would be healthy. ‘I think, after that week if the piglet is still doing alright or responded to treatment, I will find it more difficult.’

Students described factors that could be supportive: (1) justification; (2) performance; and (3) mental processing. Several students mentioned that a *justification* to end the piglet’s life could support them to perform the procedure, even if the piglet might not be terminally ill. On the one hand, students described the educational setting as a justification. On the other hand, some students referred to the fact that the piglet would have died anyway as it was kept for the production of animal products. ‘I eat meat, so I would find myself very hypocrite when I would not dare to or be able to kill a piglet, while I can have them on my plate in the evening to eat for my pleasure.’ For other students this argument felt ‘inequitable’: ‘It makes it harder when people say: that piglet will die anyway, who cares I don’t support animal production and thus find it more difficult to see the goal of killing a piglet now.’

Factors that would be helpful to the students concerning the *performance* were ‘knowledge of the procedure’ and ‘guidance and supervision’. While ‘support of peers’ and ‘support of the teacher’ were named as beneficial factors to *mentally process* the procedure.

Post-interviews

Seven themes were identified in the post-interviews: (1) educational goal; (2) animal care; (3) bond with the animal; (4) health status; (5) procedure; (6) learning environment; and (7) emotional processing. The educational goal, bond with the animal, health status, procedure, and learning environment appeared of main influence and will therefore be discussed.

Monitoring an animal, determining the HEP, and relating clinical findings to the pathology were mentioned as relevant contributions to their education. Although ending a life in itself is not an educational goal of the course, some students mentioned that they considered this a step in their development as a veterinarian. Some students shared their doubts about the added value of ending the piglet’s life, especially when there were limited signs of illness.

The health status appeared to have a major impact on the student’s experience. On the one hand, students took care of piglets with what they defined as ‘quite severe clinical signs’ such as neurological problems. Most of these students felt like the HEP was reached by the 4th course day and expressed that they found that ending the piglet’s life was justified. Part of these students experienced doubts about whether the HEP was not reached earlier that week. These doubts were erased after consultation with a teacher. Students that studied piglets with mild clinical signs described that the HEP was not reached by day 4, but that the HEP would eventually be reached shortly. Variety was seen in how students experienced this: ‘In the end, there was no other option for this piglet so eventually, he would have suffered from it,

Section 6

now we saved him that suffering. At that moment it was not yet needed to euthanise him in my opinion. Maybe in a later stage, it would have been necessary but not yet at that time.'

Some piglets had very limited clinical signs. Most of the students indicated that not reaching the HEP affected their experience: 'If we found something of which the piglet would have been ill, I would have looked back on it differently. Now I tried to talk it right, as the current housing conditions were better than on the farm. So in that sense, the past days were at least better for the piglet...'

The bond with the animal was linked, by half of the students, to the impact of ending the piglet's life on the student self. Having a bond with the piglet made it or would have made it more difficult to end the piglet's life. Due to that, some students tried to avoid building a bond: 'I tried to avoid bonding with the piglet thinking that it then would be easier to euthanise him, or that it would be a lot more difficult if I would have a bond with him.'

Regarding the procedure, most of the students typified the process as 'calm' or 'smooth'. A minority of the students had a less pleasurable experience due to: (1) procedural adjustments such as puncturing a blood vessel repeatedly; (2) unpleasant animal signs such as gasping; or (3) perceived chaos and time pressure.

Students described that they found support within the group of students when emotions were at stake. The group dynamic formed part of the learning environment for them. Furthermore, students expressed positive feelings about the guidance of teachers. Mainly the discussions with teachers about the HEP and technical elaboration on the procedure contributed to a positive experience. A few students expressed that more attention to the mental aspects of ending an animal's life during the course could have improved their experience.

Having described the themes in detail, we observe that the various aspects of the experience of the students contributed differently to the well-being of the students. Consider the bond a student has with the animal. We observed that students who *did not* form a bond with their animal reported a more positive experience of the course. In contrast, students who *did* form a bond described a more negative experience of the course. For each of the aspects, we found such contrasts: depending on the dynamic within the aspect a positive or negative impact on the wellbeing of the student is observed during or shortly after the course.

Discussion and conclusions

The current study reveals that multiple factors contribute to how students experience an EOL situation in an educational setting. Depending on the dynamic of these aspects a positive or negative impact on the student's well-being is observed during or shortly after the course.

Regarding the decision to euthanize an animal, the data reveals that the motive of an owner and the health status of the animal greatly influence whether the decision to end the animal's life was experienced as justified or acceptable by the students. Previous research accordingly reported the relevance of the moral justification to end an animal's life in the experience of students. Herzog *et al.* (1989) for example reported that killing a healthy animal was viewed by students as unethical and often mentioned as an ethical dilemma. Termination of an animal's life for educational goals was on the contrary evaluated as morally justified. In line with these findings, part of the students in the current study mentioned that the educational goal was a justification to end animal life. The moral justification of ending an animal's life for educational goals could be an example of contextually justified euthanasia as described by Yeates (2010). Bonding with the animal appeared to complicate the student's experience with euthanasia. Part of the students, therefore, tried to avoid building a bond. This finding is in line with Morris (2012) who

described that students actively tried to avoid attachment to the animal. Euthanizing an animal that a student did not know before made the experience less impactful for the student.

In the post-interview students indicate that the procedure is an important parameter in the evaluation of the act to end an animal's life. This became especially clear when the procedure needed to be adjusted or when unexpected signs such as gasping occurred. Matte *et al.* (2019) documented likewise that providing a 'good death' on a procedural level is of importance to the experience of the veterinarian and the veterinarian's well-being. An interesting observation is that students only mention the relevance of the procedure in the post-interviews. Potentially, students experienced that the procedure does not always go as desired and thus became more aware of the relevance of the procedure in how they experience euthanasia.

Based on this explorative study we have more knowledge on factors that affect how a student experiences an EOL situation and how this can affect the student's well-being. The results cannot be immediately translated to all veterinary students in all contexts because this study included only Dutch students with a specialization in the healthcare of companion animals. As a next step, it would be interesting to include students specializing in the healthcare of farm animals or equine health and compare the current results with their views. Also, studying the impact on students of other EOL situations in the curriculum would be of interest. Nonetheless, the current study aims to function as a building block in taking care of student welfare in developing and evaluating veterinary education in the context of end of life situations.

Acknowledgements

We would like to acknowledge the support of Danielle Padilla de Beer, Arie van Nes, and Bas Swildens en Nelleke Veenema for discussions on and support of this study.

References

- Batchelor CE, McKeegan DE. Survey of the frequency and perceived stressfulness of ethical dilemmas encountered in UK veterinary practice. *Vet Rec.* 2012 Jan 7;170(1):19. <https://doi.org/10.1136/vr.100262>
- Brooks J, McCluskey S, Turley E, King N. The Utility of Template Analysis in Qualitative Psychology Research. *Qual Res Psychol.* 2015 Apr 3;12(2):202-222. <https://doi.org/10.1080/14780887.2014.955224>
- Herzog Jr, H.A., Vore, T.L. and New Jr, J.C. (1989). Conversations with veterinary students: Attitudes, ethics, and animals. *Anthrozoös*, 2(3), 181-188.
- Matte A.R., Khosa D.K., Coe J.B., Meehan M.P. Impacts of the process and decision-making around companion animal euthanasia on veterinary wellbeing. *Vet Rec.* 2019 Oct 19;185(15):480. <https://doi.org/10.1136/vr.105540>
- Morris, P. (2012). *Blue juice: Euthanasia in veterinary medicine*. Temple University Press, Philadelphia, USA, 230 pp.
- Yeates, J. (2010), Ethical aspects of euthanasia of owned animals. *In Practice*, 32: 70-73. <https://doi.org/10.1136/inp.c516>

50. Playing a vet – serious games in the context of veterinary ethics

C. Dürnberger

Messerli Research Institute, Unit of Ethics and Human-Animal Studies, VetMedUni Vienna, Veterinärplatz 1, 1210 Vienna, Austria; christian.duernberger@vetmeduni.ac.at

Abstract

The article proposes a differentiation between serious games in the context of education according to types of (learning) objectives. Such games can aim to: (1) impart specialist knowledge; (2) promote specific skills; (3) change or support certain (moral) attitudes; (4) raise awareness for a specific topic and thus promote self-reflection; or (5) change specific actions and behaviour of the player in 'real life'. The paper names exemplary games for each category and argues that serious games for (veterinary) ethics in particular have potential for objective (4). The concept of a corresponding text adventure is then introduced, in which the player takes on the role of a veterinarian to learn about moral challenges the profession faces.

Keywords: veterinary ethics, ethics, e-learning, serious games, gamification

Introduction

The fact that people like to play games and that these games can also take on complex topics makes games interesting for the context of teaching and training. Accordingly, there is a growing interest in the use of games for educational purposes. So-called 'serious games' (or 'learning games') use game mechanics for a primary purpose other than pure entertainment, e.g. to teach, train or inform regarding a given topic (Michael and Chen, 2005). These games attempt a balancing act, namely combining the achievement of certain learning objectives with entertainment (Pereira *et al.*, 2012, 53; Gorbanev *et al.*, 2018), whereby the difficulty lies in not reducing games to their educational effect. In other words, if a game becomes too serious, it runs the risk of losing its appeal. In this article the focus is on computer games.¹⁴ Accordingly, a digital serious game can be understood as 'an interactive computer application, with or without a significant hardware component, that has a challenging goal, is fun to play with, incorporates some concept of scoring, and imparts in the user a skill, knowledge or attitude which can be applied in the real world' (Bergeron, 2006, 398).

Serious educational games

Laamarti *et al.* (2014) analyse which (kinds of) digital serious games are already used and propose a taxonomy based on their analysis. They first distinguish the area of application in which these games are deployed and name: education, well-being, training, advertising, interpersonal communication and health care. Accordingly, the respective activity of the player is different, for example, a game in the area of health care can prompt or remind the player to do certain fitness exercises.

This article is particularly interested in serious games in the context of the university, so the focus in the following is on education. Based on examples that can be found in the literature – in particular in literature reviews – for this type of game (cf. Laamarti *et al.*, 2014; Dürnberger, 2014; Pereira *et al.*, 2012; Groen *et al.*, 2020; Ravysse *et al.*, 2016), this article proposes a further differentiation

¹⁴ It should be noted that a 'serious game' can also be a board game or a card game. As an example we can refer to the card game 'Democs'; cf. www.edinethics.co.uk/democs/democs.html.

according to the type of (learning) objective. The following taxonomy is not an exhaustive list, nor are the categories clear-cut, rather, there may be overlaps. In the context of education, serious games can aim to: (1) impart specialist knowledge; (2) promote specific skills; (3) change or support certain (moral) attitudes; (4) raise awareness for a specific topic; or (5) change specific actions and behaviour of the player in 'real life'.

Examples can be found for each of these learning objectives. Ad (1): Klit *et al.* (2020) presented a game on veterinary herd health management, teaching veterinary students for example relevant knowledge about disease detection. In this case, the acquisition of knowledge can be evaluated by a classical examination. Ad (2): A second group of games focuses less on (theoretical) knowledge and more on practical skills. Jeuring *et al.* (2015) discuss for example the concept of a serious game that can help health care professionals improve their communication skills. The player chooses between different answers in a conversation with a patient and receives feedback through scoring points on the extent to which the chosen communication strategy was appropriate. Ad (3): A game can also have the goal that the user adopts a certain (moral) attitude. In the game 'World Without Oil' (McGonigal, 2012), the player has to learn to master everyday life in a post-fossil society. For example, they are supposed to identify ways to reduce their own energy consumption and, together with other players, develop strategies to counter a possible real oil crisis in everyday life. The slogan of the game, namely 'Play it – before you live it', suggests that the game tries to convince the player that there are good moral reasons for saving energy. In doing so, the game also raises awareness for the general topic, so the boundaries to the next category are fluid, however, the learning objectives of (3) and (4) are not identical, because: (4) A game can have the goal of developing more awareness of an important issue without pretending to know what exactly is the morally correct answer to a particular question. For example: Tsopra *et al.* (2020) present 'AntibioGame[®]', a game that seeks to raise awareness of 'One Health' and 'antibiotic use' among medical students. Katsarov *et al.* (2020) discuss the conception of a 'serious moral game' called 'uMed: Your choice'; a game that is intended to train the 'moral sensitivity' of medical students, meaning they should gain awareness of morally relevant situations in their profession. In the context of 'raising awareness', games can furthermore provide emotional access to situations that are less accessible in 'real life' or through other media (Heron and Belford, 2014). This approach can be conducive to empathy. For example, in games such as 'Syrian Journey', 'Migrant Trail' or 'Frontiers', the player can/must take on the role of a refugee. Finally, (5) games can aim to influence and change the players' actions and behaviour. In this context, the keywords 'nudging' and 'gamification' are worth mentioning. Gamification means the use of game elements beyond usual games (Deterding *et al.*, 2011, p. 2). An example for the last objective may be found in the following application: In 2010, the car manufacturer Ford integrated an additional display on the dashboard of specific car models, showing a plant. If the car owner drives in an energy-saving manner, this plant grows and thrives; if the driving behaviour is wasteful, however, it withers away. As simple as this tool is, it has the core elements of a game, namely it should be fun to play it, it has a set goal, a defined set of rules and a feedback system. The game tries to change the user's driving behaviour not via moral appeals (for a more sustainable lifestyle/driving style) but via gamification.

With a focus on education, Ravyse *et al.* (2016) conducted a systematic review on the question of what actually characterises serious games that are described as successful. (The following summary is selective, as it e.g. only mentions criteria beyond technical handling.) (1) It is the story and atmosphere of the game that keeps players engaged; something must fascinate them; otherwise they will stop playing. (2) Learning should not happen too obviously, i.e. it should not be too much in the centre of attention, but ideally happen more 'incidentally'. The game experience should not be interrupted too often. (3) The game should give feedback that helps the player recognise to what extent their decisions have an effect or to what extent they have learned something. This can be called a reward system. (4) Players should have the feeling that their decisions make a difference. The gameplay should not be too linear.

Teaching (veterinary) ethics via serious games

While there is a boom in literature around serious games in the context of education, there is still little discussion of the use of these games for ethics. This is even more true for the field of veterinary ethics. Teaching of ethics has been increasingly integrated into the veterinary curriculum at various universities in recent years, including topics like animal welfare, laws/regulations, professionalism, and ethical theories/concepts (Magalhães-Sant'Ana, 2014). There is no doubt that veterinarians have a special responsibility in the transformation process of food systems, be it in terms of food security, hygiene or animal welfare. And it is equally undoubted that veterinarians are confronted with moral challenges in all these contexts.

To what extent can serious games play a role in ethics education? First of all, exemplary games can be thought of for all the categories mentioned. However, when we reflect on serious games for ethics education, this raises the question about the role and self-understanding of ethics. Why, for example, is ethics taught to veterinary students? Should students learn about the history of philosophy and be able to explain central concepts such as speciesism according to Singer or the paediatrician model in contrast to the garage mechanic model according to Rollin? Should ethics answer the question what to do in a morally relevant situation and make sure that veterinarians have the 'right' moral attitude? Or is ethics education about understanding moral difficulties? These – exemplary – approaches don't need to be mutually exclusive, however, there is a difference in emphasis. Anyone who wants to develop a serious game about 'ethics for veterinary medicine' must therefore first of all clarify the discipline's self-image in this context and define corresponding learning objects. The article suggests – following Dürnberger (2014) – that serious games for ethics in particular have potential for objective (4) (= raising awareness and promote self-reflection).

To elaborate on this, let's take a closer look at the world of games more broadly, and at classics in particular. What characterises games that have caused a sensation in recent years? It's not only the graphics, but especially the 'freedom of action' of the player. Unlike earlier jump and run games, for example, the player can now actually make decisions – and these have consequences for the course of the game. To give examples: In 'Fallout 3' (2008), the player receives the order to detonate an atomic bomb in a settlement – and you as the player must decide: Do you set off the bomb for good money? Do you deactivate it? Or do you accept the money, but then betray the client? Another popular game with high autonomy is the multiple award-winning 'Heavy Rain' (2010) that has eighteen alternative ends – depending on which decisions the player has made before. From a philosophical point of view, such games are exciting, because: Where there is such freedom of action, not only dramaturgical tension arises, but also questions of ethics become relevant. Such games don't have a clear pedagogical mandate; they are not intended to convey concrete learning content or motivate people to act in a 'better' way. The popularity of these games points to a special potential for serious games: These games, too, should not 'preach' what is right, but make 'freedom of choice' and corresponding consequences tangible and thus promote critical reflection on one's own actions. Serious games for ethics should not be (bad) sermons, that just want the player to recognize the 'right moral paths' of the game and follow it to be rewarded; instead they should promote the ambiguity of ethical decision-making and the fact of moral uncertainty. Such serious games would strive less to convey concrete learning contents and to insist on what is morally correct, and more to ask morally relevant questions to which there are no simple answers by default. The philosopher Miguel Sicart, in fact, calls on game developers to purposefully create game situations that challenge ethical reflection (Sicart, 2010, p. 102 ff.). In these game situations – he speaks of 'ethical gameplay' – the player has to choose between several options. The focus is less on strategic thinking (i.e. what means do I have to use to achieve the goal X?) than on fundamental questions: Is the stated goal worth pursuing at all? Couldn't and shouldn't I act quite differently? According to Sicart, current games rarely have such ethical gameplays. Among other things, they suffer from the basic problem that the

player is too well informed and can usually assess very precisely which decision will lead to success within the framework of the game (Sicart, 2010, p. 106). Sicart describes these 'ethical gameplay' situations as a moment of pausing, a caesura in the course of the game in which purely strategic thinking is no longer effective. In such situations, no concrete learning content or concrete attitude is conveyed.

In the context of the goal 'raise awareness', it was also mentioned that games can be beneficial to put oneself in a certain role – and thus to better understand how it feels to take on this role. In the present context, veterinary ethics, a variety of possibilities are conceivable: For example, a game could portray what it means to be a veterinarian; or a farmer who has hardly any financial means to improve the housing conditions for his animals; or an animal owner who has no money for treatment; or finally, a game could also make the role of an animal accessible. According to Thomas Nagel (1974), we do not know what it feels like to be a bat – computer games such as 'The Endless Forest' (2006), in which one controls a stag, or 'WolfQuest' (2007), which let the user become a wolf, will not change this. And yet, games that put us in the role of animals are remarkable, since they can potentially be assigned the function that Richard Rorty assigns to literature. Rorty (1999) was convinced that a book like 'Uncle Tom's Cabin' (1852) had more influence on the development of human rights and the abolition of slavery than abstract ethical justifications. Why? Because telling stories leads people to put themselves in someone else's inner perspective, which can motivate them to take the other's interest into moral consideration (cf. Kennigott, 2012). Computer games must be considered to have special potential: The player not only listens to the story but can interactively shape it – as mentioned above with an astonishing range of freedom of action. The player is emotionally involved and identifies with the character (cf. Pohl, 2008, p. 100 ff.) – and this character does not necessarily have to be human. To create a game character and – to give a fictitious example – to take on the role of a chicken, as she masters her everyday life in a battery, should not leave the player unaffected.

Playing a vet

The author of this article tries to develop a game on the basis of what has been said so far. The game is to be located in the context of 'veterinary ethics' and is committed to learning objective (4), i.e. it wants to create awareness for certain topics and promote critical self-reflection. More precisely, the game does not want to convey any concrete content about any morally right or wrong behaviour as a veterinarian, but 'only' a supposedly simple fact, namely *that* veterinarians are confronted with moral challenges in their profession. The game is intended to be used in the first semester at university, when students may doubt why the subject 'ethics' appears in their curriculum at all.

The first draft of this game is as simple as possible in terms of game mechanics, namely a text adventure. At the same time, the game tries to realise central criteria discussed above: (1) The players' decisions have consequences for the development of the story. (2) The players get immediate feedback for (nearly) every decision they make, however, this feedback is in most cases contradictory in order to demonstrate the complexity of moral relevant challenges. These two points can best be illustrated by describing exemplary scenes from the game: The players take on the role of a veterinarian. At the beginning of the game, they are sitting in the veterinary practice late in the evening and the doorbell rings. However, the practice has already been closed for an hour. The players can decide whether to open the door or not. The decision influences the course of the game. If you don't open the door, the vet comes home early. If the players open the door, they are confronted with a woman who happened to find an injured hare on the side of the road. The woman insists that the veterinarian help the animal immediately – but does not want to pay the bill because the hare does not belong to her. The decisions made by the players not only affect the plot of the game, but also a predetermined scoring system. To describe this scoring system in more detail: It has four categories/bars. These are: (1) money; (2) work-life balance; (3) karma: people; (4) karma: animals. Each bar varies between the values 0 and 100. Each bar starts at 50 points. For some

Section 6

decisions the players make, 10 points are added, for others 10 points are subtracted. If the players have reached 100 points in a category, there is no more change. The same happens when the bar shows '0'. With (nearly) every decision, the players see immediately what the effect of their decision is. At the same time, it is not a simple reward system, because, for example, a decision can have a positive effect on category (1), but at the same time a negative effect on category (4). The game is therefore intended to show the complexity of decisions as well as the fact that veterinarians are committed to a variety of goals and values. To give an example: If a pet owner has no money for the treatment of her sick hamster and therefore wants a (cheaper) euthanasia and the players comply with this wish, the bar 'Karma: Human' increases (because one accommodates the interests and wishes of the human), at the same time the bar 'Karma: Animal' decreases. The reason for this is obvious: an animal that can be treated is killed for financial reasons. If the players in this situation offer to pay for the costs themselves, this is positive for 'Karma: Animal' and 'Karma: Human', but negative for 'Money', i.e. for the practice's cash box. Thus, the game system gives feedback, but not an unambiguous one, rather it shows the conflicts and dilemmas. In this way one spends a whole day as a veterinarian and is confronted with different contexts, i.e. not only with companion animals in the practice but also with a visit to two farms. At the end, the players receive an evaluation of how the four categories have developed over the course of the day. Of course, the scoring system described is an oversimplification compared to decision-making in 'real life'. At the same time, it is a game mechanic, i.e. it must necessarily be simple, otherwise games are no fun; moreover, the game is used at the beginning of the study programme and is not intended to provide any concrete content, but only to illustrate that veterinarians have to deal with moral challenges. It is planned that the game will be realized by 2023 and will be usable as a mobile game. There is no funding, rather it is a project that students of a university of applied sciences should realize within the framework of a seminar.

Outlook

Serious games could play an increasingly important role in veterinary ethics. First of all, the self-understanding of ethics in this context needs to be clarified. This article proposed a taxonomy of five different types of serious games for education and argued that the goal of 'raising awareness' in particular could be realised well through games. This does not mean, however, that the other four objectives should be ignored; on the contrary, it would be desirable if such games were developed and subsequently evaluated scientifically.

References

- Bergeron B. (2006). Appendix A: glossary. In: Developing serious games. Hingham: Charles River Media.
- Deterding, S.; Khaled, R.; Nacke, L.E.; Dixon, D. (2011). Gamification: Toward a definition. CHI 2011 Gamification Workshop Proceedings. Vancouver, 7-12 May. <http://hci.usask.ca/uploads/219-02-Deterding,-Khaled,-Nacke,-Dixon.pdf> Accessed 21 January 2022.
- Dürnberger, C. (2014): Computerspiele für eine bessere Welt? (Natur)ethische Fragestellungen in video games. GAIA 3/2014: 231-235.
- Gorbanev, I. *et al.* (2018). A systematic review of serious games in medical education: quality of evidence and pedagogical strategy. Medical Education Online 23:1. DOI: 10.1080/10872981.2018.1438718
- Groen, M.; Kiel, N.; Tillmann, A.; Weßel, A. (Ed.). (2020). Games and Ethics. Theoretical and Empirical Approaches to Ethical Questions in Digital Game Cultures. Springer, Wiesbaden.
- Heron, M.; Belford, P. (2014). 'It's only a game' – ethics, empathy and identification in game morality systems. Comput Game J 3, 34-53. <https://doi.org/10.1007/BF03392356>
- Jeuring J. *et al.* (2015). Communicate! – A Serious Game for Communication Skills. In: Conole G., Klobučar T., Rensing C., Konert J., Lavoué E. (eds) Design for Teaching and Learning in a Networked World. EC-TEL 2015. Lecture Notes in Computer Science, vol 9307. Springer, Cham. https://doi.org/10.1007/978-3-319-24258-3_49

- Katsarov, J.; Biller-Andorno, N.; Eichinger, T.; Schmocker, D.; Christen, M. (2020): uMed: Your choice – Conception of a digital game to enhance medical ethics training. In: Groen, M.; Kiel, N.; Tillmann, A.; Weßel, A. (Ed.). (2020). Games and Ethics. Theoretical and Empirical Approaches to Ethical Questions in Digital Game Cultures. Springer, Wiesbaden, pp. 197-212.
- Kenngott, E.-M. (2012). Perspektivenübernahme. Zwischen Moralphilosophie und Moralpädagogik. Wiesbaden: VS Verlag für Sozialwissenschaften.
- Klit, K.J.M.; Nielsen, C.K.; Stege, H. (2020): Iterative Development of a Digital Game-Based Learning Concept: Introduction of Veterinary Herd Health Management in a Virtual Pig Herd. *Journal of Veterinary Medical Education* 47(4), 523-531.
- Laamarti, F.; Eid, M.; El Saddik, A. (2014). An Overview of Serious Games. *International Journal of Computer Games Technology* 2014(3). DOI: 10.1155/2014/358152.
- Magalhães-Sant'Ana, M. (2014). Ethics teaching in European veterinary schools: a qualitative case study. *Veterinary Record*, 175: 592-592. <https://doi.org/10.1136/vr.102553>
- McGonigal, J. (2012). *Besser als die Wirklichkeit. Warum wir von Computerspielen profitieren und wie sie die Welt verändern.* München: Heyne.
- Michael, D.R.; Chen, S.L. (2005). *Serious Games: Games That Educate, Train, and Inform.* Muska & Lipman/Premier-Trade.
- Nagel, T. (1974). What is it like to be a bat? *The Philosophical Review* 83/4: 435-450.
- Pereira, G. *et al.* (2012): Serious Games for Personal and Social Learning & Ethics: Status and Trends. *Procedia Computer Science* 15: 53-65. DOI: 10.1016/j.procs.2012.10.058
- Pohl, K. (2008). Ethical reflection and emotional involvement in computer games. In: Conference proceedings of the philosophy of computer games. Edited by S. Günzel, M. Liebe und D. Mersch. Potsdam: University Press. 92-107.
- Ravyse, W.S.; Blignaut, A.S.; Leendertz, V.; Woolner, A. (2016). Success factors for serious games to enhance learning: a systematic review. *Virtual Reality* 21: 31-58.
- Rorty, R. 1999. *Philosophy and social hope.* New York: Penguin.
- Sicart, M. (2010). Wicked games: On the design of ethical gameplay. *Desire 10. Proceedings of the 1st Desire Network Conference on Creativity and Innovation in Design.* 16-17 August. 101-111. <http://itu.dk/~miguel/DesignReadings/Wicked.pdf>. Accessed 21 January 2022.
- Tsopra *et al.* (2020): AntibioGame®: A serious game for teaching medical students about antibiotic use. <https://doi.org/10.1016/j.ijmedinf.2020.104074>

51. Veterinary responsibility for antibiotic resistance

M. Huth^{1,2*} and J. Karg¹

¹Messerli Research Institute, Veterinärplatz 1, 1210 Vienna, Austria, ²Department of Philosophy, Universitätsstraße 7, 1010 Vienna, Austria; martin.huth@vetmeduni.ac.at

Abstract

This paper aims to investigate the responsibility of veterinarians for the rise of antibiotic resistance, focusing mainly on the context of farm animal medicine. The extensive use of antibiotics in animal husbandry for pro- and metaphylaxis, cure and growth promotion has – in addition to its use in human medicine – contributed to the increase of antibiotic resistances, which represents a global threat for human and animal health. Yet, the question emerges whether, in what way and to what degree practical veterinarians should be held accountable for the consumption of antibiotics and the increase of resistances. Basically, we suggest to frame antibiotic resistance as a problem of justice. Justice here relates to the sharing of antibiotics as common resource, which becomes scarce precisely due to the emergence of resistances, but which is also possibly entirely destroyed by over-consumption. To put responsibility in perspective, we will highlight that veterinary practice is embedded in socio-economic and institutional structures. Burdening veterinarians with the entire responsibility for the consumption of antibiotics in livestock farming is at odds with a reasonable picture of their possibilities in relation to these structures. Therefore, we suggest to distinguish between three levels of responsibility: (1) recommendations by global actors such as the WHO, the FAO, the OIE and, and legal regulations by nation-states; (2) institutions that relate to veterinary practice are in charge of concretizing the legal regulations in more precise rules or codes of conduct. Moreover, a sensitization of veterinarians in the context of their education is needed; (3) practical veterinarians are neither to be regarded as hench(women) of agricultural structures and institutions nor as hench(women) of attempts to maximize profit. But in order to be able to live up to their responsibility and exert their expertise, the scope of the responsibility for their decisions or recommendations for owners must be clear.

Keywords: antibiotic resistance, public health, justice, veterinary responsibility

Introduction

Since the development of the first antibiotics in the 1940s by Alexander Fleming, they have been the most important means to combat bacterial infectious diseases in humans and animals and have saved millions of lives every year (Anomaly, 2019). However, Fleming was already aware of the danger of an erosion of the efficiency of antibiotics. Their use reinforces the natural occurrence of resistance against antibiotics since they interfere in the selection pressure on bacteria strains: Non-resistant ones are killed, which is an advantage for the resistant ones. Moreover, microbes ‘ chatter’, i.e. genetic exchange frequently happens between microbes, which contributes to the increase of antimicrobial resistances (Hinchliffe *et al.*, 2017).

It is estimated that currently about 700,000 deaths p.a. are caused by infections with resistant pathogens (Anomaly, 2019). Therefore, there is a broad recognition that antibiotic resistance is a global threat for human and animal health. A ‘post-antibiotic era’ represents a veritable dystopia as many standard procedures are potentially much more complicated or even impossible without efficient antibiotics: ‘Successful surgery, transplantation, care of newborn children, and chemotherapy for cancer, for example, all depend upon effective antibiotics to treat infections that could otherwise be fatal.’ (Jamrozik and Selgelid, 2020, v). Also, ‘significant effects on public health policy and potentially dramatic effects

on social life' (Jamrozik and Selgelid, 2020, vi) would emerge, of which we have experienced a good portion during the pandemic of SARS-CoV-2. The optimistic argument that new, even more efficient antibiotics and different treatments will be developed is problematic as this is nothing more than a mere supposition (and there is no significant leap in the effort to develop new drugs in order to substitute current antibiotics).

Veterinary medicine, especially farm animal medicine, has always been at the interface between human public health and animal health; food security and zoonotic diseases are an illustrative example. Antibiotic resistances have begun to play a significant role at the intersection of human and animal health: 'For *Salmonella* spp. and *Campylobacter* spp., the link between antimicrobial resistance in humans and animals is well established, noting that identical mechanisms are used by bacteria from human and animal sources to acquire antimicrobial resistance. For other zoonotic bacteria, including *Escherichia coli*, *enterococci* and *Staphylococcus aureus*, the human and animal ecosystems are interlinked' (More, 2020: 2). Unsurprisingly, the debates on One Health initially emerged in the context of zoonosis (AVMA, 2008). It represents the aim and the effort of bridging medical knowledge and practice between humans and animals and to acknowledge the interrelatedness of human and animal health in a shared environment, which is fundamentally a microbial environment (Hinchliffe, 2016).

Veterinarians on the fence: between animal and human health

It seems as if the role of practical veterinarians is particularly difficult: Antibiotics are considered to be the gold standard in the treatment of bacterial infections since they are cheap, easily available and (still) highly effective. They are applied as cure for the individual animal and to prevent an entire herd from being infected. Thus, they are broadly used for livestock animals but also for companion animals. Being confronted with individual animals with, for instance, painful inflammations or high fever, veterinarians may regard the relief from suffering as primary ethical obligation. Rollin's famous pediatrician model veterinarians emphasizes the primary allegiance to animals and not to the owners or other stakeholders (Rollin, 2006). Moreover, the individual contribution antibiotic resistance appears to be trivial.

But the widespread use of antibiotics particularly in livestock farming is considered as significant contribution to the increase of antibiotic resistances (Anomaly, 2020). Also, so-called reserve antibiotics are in use in livestock animals (and in companion animals). The debates in the EU on stricter regulations of the use of these antibiotics in order to keep resistance pressure low has engendered controversial discussion and did not lead to a ban for animals (The Economist, 2022).¹⁵

Practical veterinarians, therefore, appear to be on the fence: Expectations regarding the treatment of animals collide with expectations regarding the decrease of antibiotic consumption in animals. What is more, the health of the concrete individual animal within the very clinical encounter collides with the abstract health of future generations of humans and animals who could be affected by antibiotic resistances. At the same time, common practices, socio-economic structures, animal owners, etc. pre-determine or are involved in decision-making, and, moreover, veterinarians are dependent on the owners' trust to earn their living. Contradictory expectations often evoke moral distress, and it has been highlighted that veterinarians are particularly prone to this sort of psychological burden (Fawcett and Mullan, 2018).

Further, the debates on a possible ban of certain antibiotics for animals all together (including not only livestock, but also companion animals) appear to undermine the paradigm of One Health since human

¹⁵ Notably, the extent of this use is globally unequally distributed. While in the EU, the use of antibiotics as growth promoter and thus without medical indication is permitted, this is not the case in various other regions of the world.

Section 6

and animal health tend to become framed as antagonistic. The dawning of a view of animal health as opposed to human public health can be regarded as additional deterioration of the veterinarians' issue.

Framing the ethical problem: responsibility antibiotic resistance

In order to put veterinary responsibility in perspective and, thus, to contribute to a reduction of moral distress, it is necessary to clarify the ethical basis. We suggest to understand the ethics of antimicrobial resistance in an analogy to the ethics of natural common-pool resources. Antibiotics and their effectiveness can be understood as common good. Their use structurally resembles the use of natural resources in terms of an uncoordinated exploitation, which potentially leads to a scarcity if not loss of the resource (as expressed in Hardin's concept of a 'tragedy of the commons'). Therefore, Kallhoff's account of climate ethics (2021) builds a starting point for our considerations. She proposes to analyse the 'use' of the biosphere through the conceptual lens of justice and links it to joint agency and, by the same token, to a joint responsibility. This can be transferred to the consumption of antibiotics. 'If we agree that a minimum level of health care is right, then justice requires that all individuals in society have access to this minimum level of care.' (Graber, 2006, 48). For the context of human medicine, a cost-effective prescribing is, thus, an ethical obligation to preserve medical resources for everyone. However, things become more complicated if we consider the sustenance of antibiotics for future generations – and if we take animals into account, too. In contrast to a mere distributive justice (of, say, a scarce resource), the scope of justice has to be extended in order to live up to the problems caused by the increase of antibiotic resistances: Justice is now to be understood as anticipatory and as including the possibility of a full exhaustion of the resource due to chaotic or over-use (Kallhoff, 2021, 34); this requires not only of a fair distribution of benefits and burdens but also a mindfulness of particularly detrimental outcomes. Further, a balance between humans and animals is needed, it must, thus, be an interspecies justice that connects to the ethical requirements of One Health.

Notably, a significant difference occurs if we consider the role of antibiotics for the treatment of livestock animals in contrast to the treatment of companion animals. First, the number of animals is much higher in agriculture. Second, many of these animals live in cramped conditions with other animals and are, thus, exposed to a higher infection pressure (Hinchliffe *et al.*, 2017). If an individual pig in a stall with, say, 50 other pigs shows symptoms such as cough, a typical way to react is to administer antibiotics through the drinking water. The tight margins in meat production seem to compel farmers and veterinarians to take measures, which are inexpensive and simple (also without focusing on each individual animal). Third, there are variegated preconditions under which veterinary treatment is conducted: While companion animals are usually (though not always) understood as family members and veterinary treatment primarily seeks to sustain or regain long-term well-being, livestock animals are often treated in order to sustain or regain productivity (since owners are economically dependent on the animals' performance). Therefore, veterinary practice pursues different 'kinds' of health (Huth *et al.*, 2019; Huth, 2020).

Doing justice on three levels of responsibility

The question emerges how individual veterinarians could be able to comply with the justice of antibiotics consumption, especially in agriculture with its socio-economic preconditions and against the backdrop of the tensions between clinical encounters with suffering animals and the health of (future) populations. In what follows, we propose to distinguish between three levels of responsibility. Each of them has a specific scope. Level 1 (regulations by supranational and national organizations) can be held responsible for general rules and laws that should balance benefits, burdens and the likelihood of a collapse of the efficiency of antibiotics; local or individual particularities cannot be taken into account. Level 2 (veterinary institutions) pertains to specific practices and cultures in a given context. Level 3 represents

individual responsibilities in particular situations, which are primarily oriented towards animals and owners. We do not claim that these levels are totally distinct. However, in order to put veterinary responsibility in perspective, it seems inevitable to clarify the possibilities and limits of individual decision-making and behaviour.

Level 1: Regulations

Veterinary medicine is embedded in legal, socio-economic and political settings (Huth *et al.*, 2019). Moreover, the scope of decision-making is limited by economic needs of owners determined by prices and tight margins. Agricultural structures, thus, lead to particular keeping conditions (how 'one' keeps), food regimes, typical treatment standards for veterinarians etc. For instance, in pig and poultry production we can see particularly dense keeping conditions, an accelerated throughput of feed, breeding lines that are particularly 'infectable' because the breeding aims primarily at growth rates, confinement buildings with hygiene measures that make ordinary infections and the development of a normal immune system virtually impossible. This leads to an augmented 'pathogenicity' (Hinchliffe *et al.*, 2017), which in turn makes the use of antibiotics critical and frequent. Clearly, the individual practitioner is not in the position to effectively influence these structures. Also, institutions such as veterinary universities, veterinary chambers or pertinent interest groups lack the power to determine these structures and patterns of common practices. Thus, the responsibility for governance as a fundamental part of justice is to be located at the level of supranational and national organizations such as the WHO, the FAO or the OIE, all of which are in the position to develop recommendations for farmers, veterinarians, but also consumers. However, due to the fact that supranational institutions usually lack the possibility to legislate and enforce laws, legal regulations on the level of national law are of crucial relevance for a decrease of the use of antibiotics. Here, we do not only refer to rationing of antibiotics or a possible ban of certain antibiotics for (some) animals but also to the arrangement of basic agricultural structures as determinant background for collective behaviour.

Level 2: Institutions

However, recommendations by international organizations and legal regulations might be insufficient to guarantee that veterinarians are not burdened with different, in case mutually contradicting expectations of individual owners (who want an effective cure) and the public (who might want a decrease of the animal consumption of antibiotics) because general legal regulations can hardly anticipate singular situations. Too strict regulations could be perceived as authoritarian or paternalistic, too weak ones are either inefficient or put the burden on individual practitioners, who might see themselves as individual fighters. General regulations can only predetermine the scope of decision-making.

To mitigate the ethical burden of veterinarians, a thorough professional ethics, codes of conduct, transparent guidelines and an overall sensitization of veterinarians is required. Broadly shared standard procedures and common practices regarding the prescribing of antibiotics could embed the individual veterinarian in a shared morality of veterinary medicine (Huth, 2020). Particularly veterinary education, especially at universities, can be conceived of as the predestined field for the training concerning a decent antimicrobial stewardship.

Such stewardship does not only pursue expertise with respect to treatment, diagnostics or prevention, but also augmented awareness about the special responsibility. A crucial stepping stone for justice concerning antibiotic resistance is a common ground or line of thinking (and conduct), which facilitates individual decision-making. This also opens the possibility to justify suggestions and decisions by referring to a shared veterinary practice instead of being the individual admonisher in the name of justice, who possibly refuses to make use of the best available treatment.

Section 6

Level 3: Individuals

Finally, of course, the individual veterinarian is still responsible for concrete decisions and treatments. Even if the legal regulations and institutionalized practices pre-determine a good deal of treatment options, clinical encounters are always singular and cannot be fully anticipated by general regulations and norms on level 1 and 2. We consider it as problematic to burden the practitioner with decisions that pertain to public health while s/he is confronted with an individual suffering animal and contributes to the general problem in an almost trivial way.

Yet a sensitization and typical standard procedures might lead a veterinarian to recommend or use more often other treatments than antibiotics (with negative effects for the individual animals, for instance, a more severe course of a disease). Crucially, then the role of the veterinarian cannot be understood as either according to the pediatrician model (caring for the animal as for a child) or to the mechanic (fixing damages in the owner's interest), as Rollin (2006) suggests. Even though Rollin's heuristics is helpful to make explicit that there are different expectations and understandings of the role of veterinarians are at stake, it neglects wider contexts of responsibility for wider (future) populations. Albeit the individual contribution seems to be trivial, it is part and parcel of the ethical problem. Veterinarians, thus, are also required to contribute to a decrease of the consumption of antibiotics. However, the application of general regulations and the concretization of common practices has to be sensitive to the individual animal and the owner's situation. Doing justice becomes situational and contextual. Particularly the owner's compliance is relevant as her/his consent and behavior is part of veterinary treatment and a part and parcel of a joint action as envisioned in Kallhoff's (2021, e.g. 78) theory of shared responsibility in the face of the exploitation of common resources.

Conclusions

Antibiotic resistances build a potential global threat for the health of future human and animal populations. This paper attempted to put veterinary responsibility for antibiotic resistance in perspective. We tried to clarify whether, in what way and to what degree practical veterinarians should be held accountable for the consumption of antibiotics. We suggested to understand antibiotic resistance as a problem of justice. Justice here relates to the sharing of antibiotics as common resource, which becomes scarce or is even destroyed by the emergence of resistances. Veterinarians are responsible for prescribing antibiotics. However, we emphasized that veterinary practice is embedded in socio-economic and institutional structures. Burdening veterinarians with the entire responsibility for the consumption of antibiotics in livestock farming does not conform to a reasonable picture of their possibilities in relation to these structures. Therefore, we suggest to distinguish between three levels of responsibility: First, recommendations by global organizations such as the WHO, the FAO, the OIE and, and legal regulations by nation-states set the standards of a fair distribution of the burdens of a reduction of the use of antibiotics. Second, institutions that relate to veterinary practice are in charge of translating the legal regulations in more precise rules and codes of conduct as well as a sensitization of veterinarians through education. Third, for practical veterinarians, doing justice means a situational and contextual application of the prerequisites provided by level 1 and 2. Yet the opposition between responsibility for the animal and responsibility for the owner turned out to be too simplistic because future populations are affected from the current antibiotic consumption. Therefore it is also important to find a shared basis with owners in order to decide and act together; but this is only possible if the practical veterinarian is not regarded as opponent or as the actual authority who limits the use of antibiotics.

References

- Anomaly, J. (2019). 'Antibiotics and animal agriculture: the need for global collective action'. Jamrozik, E. and Selgelid, M. (eds.): *Ethics and antimicrobial resistance*. Springer, New York, USA, pp.1-11.
- AVMA (2008). *One Health: A New Professional Imperative*. Available at: https://www.avma.org/KB/Resources/Reports/Documents/onehealth_final.pdf.
- Fawcett A., Mullan S. (2018). Managing moral distress in practice. *In Practice* 40 (1): pp. 34-36.
- Grabber, M. (2006). 'Can I have that drug I saw on TV?': justice, cost-effectiveness, and the ethics of prescribing. *JAAPA* 19:7, pp. 48-49.
- Grimm, H. and Huth, M. (2016). The 'significance of killing' versus the 'death of an animal'. In: Meijboom, F.L.B. and Stassen, E.N. (eds.): *The end of animal life: a start for an ethical debate. Ethical and societal considerations on killing animals*. Wageningen: Wageningen Academic Publishers: pp. 79-101.
- More, S. J. (2020). European perspectives on efforts to reduce antimicrobial usage in food animal production. *Irish Veterinary Journal*, 73: 2. <https://doi.org/10.1186/s13620-019-0154-4>
- Hinchliffe, S. (2016). More than one world, more than one health: Re-configuring interspecies health. *Social Science and Medicine*, 129, pp. 28-35.
- Hinchliffe, S., Bingham, N., Allen, J., Carter, S. (2017). *Pathological Lives. Disease, space and biopolitics*. Wiley Blackwell, Oxford, UK.
- Huth, M., Weich, K. and Grimm, H. (2019). Veterinarians between the Frontlines!? The Concept of One Health and Three Frames of Health in Veterinary Medicine. *Food Ethics. A Journal of the Societies for Agricultural and Food Ethics* 3 (1-2): pp.91-108.
- Huth, M. (2020). On facing different kinds of animals – reflecting veterinary responsibility. *Berliner und Münchener Tierärztliche Wochenschrift* 133(3-4): pp. 238-247.
- Rollin, B. (2006). *An Introduction to Veterinary Medical Ethics: Theory and Cases*. Ames: Blackwell, USA.
- Jamrozik, E. and Selgelid, M. (2020). Introduction: Ethics and Drug Resistance. Jamrozik, E. and Selgelid, M (eds.). *Ethics and Drug Resistance: Collective Responsibility for Global Public Health*. Springer, Cham, CH, pp.v-xiv.
- Kallhoff, A. (2021). *Climate Justice and Collective Action*. Routledge, London, UK.
- The Economist (2022). Many European farmers still give their animals too many antibiotics. <https://www.economist.com/graphic-detail/2022/02/02/many-european-farmers-still-give-their-animals-too-many-antibiotics>.

52. Job stress of Korean veterinarians and the effect on job satisfaction

Y. Jung*, S. Joo and M.S. Chun

College of Veterinary Medicine, Seoul National University, Seoul 08826, Korea; vethics@korea.ac.kr

Abstract

This study investigates the stressors of Korean small animal practitioners and their impact on job satisfaction. The survey was conducted on 5,873 Korean small animal veterinarians. The collected 714 valid questionnaires (12.2% completion rate) were analysed. The questionnaire consisted of the respondents' demographic characteristics, job stress experience, and job satisfaction. On the 5-point Likert scale, job stress questions covered the stressors (pressure on successful outcomes of medical treatment, ethical dilemma, communication with demanding clients, and bad working conditions). Pressure on the successful outcome of the treatment caused the highest job stress for small animal veterinarians. Stress from pressure on successful outcomes and stress from bad working conditions were significantly different between the groups of gender, age, employment status, and the number of colleague veterinarians. According to regression analysis, the degree of stress was negatively correlated with job satisfaction. However, stress caused by ethical dilemmas did not negatively affect job satisfaction. The results of the study suggested that certain types of stress were more vulnerable to certain groups. Further research is needed to develop in-depth understanding and coping strategies for stress types and vulnerable groups.

Keywords: job stress, ethical dilemma, job satisfaction, small animal veterinarian, Korean veterinarian

Introduction

Veterinarians need to maintain their health to provide quality veterinary services and individual welfare. Infectious diseases and injuries have been significant occupational risks for veterinarians in the past, but new problems such as mental health are increasingly emerging (Bonini and Buonaccina, 2015, Fritschi *et al.*, 2009; Gardner and Hii, 2006; Hansez *et al.*, 2008; Reijula *et al.*, 2003). Stressors that can threaten the mental health include; euthanasia (Bartram and Baldwin, 2010; Gardner and Hini, 2006), compassion fatigue (Rohlf, 2018), relationships with colleague veterinarians and team members (Gardner and Hini, 2006), ethical dilemma situations (Moses *et al.*, 2018), patients' unexpected prognosis and litigation (Stafford, 2016). In particular, ethical dilemmas and moral stress could be significant causes of stress for veterinarians (Moses *et al.*, 2018). This study investigates the stressors of Korean small animal practitioners and their impact on job satisfaction.

Methods and data analysis

After approval by the Seoul National University Institutional Review Board (SNU-IRB NO. 1910/002-019) with the help of the Korean Veterinary Medical Association, we distributed the questionnaire made by the Survey Monkey to the registered small animal practitioners through mobile (n=5,873, March 19 to March 26, 2020). Among the 946 responses (response rate 12.2%), the completed 714 questionnaires were analysed.

The questionnaire consisted of three parts; the respondents' demographic characteristics (gender, age group, number of colleague veterinarians, employment status), job stress experience, and job satisfaction. On a 5-point Likert scale, job stress questions covered the stressors (pressure on successful outcomes of medical treatment, ethical dilemma, communication with demanding clients, and bad working conditions). SPSS 25.0 was used for statistical analysis of the collected data. One-way ANOVA or t-test was performed to test the significant difference between the groups. Regression analysis was performed to analyse the effect of job stress on job satisfaction.

Results

The pressure on successful outcomes of medical treatment caused the highest job stress for small animal veterinarians (Table 1). The degree of stress by pressure on successful outcomes differed significantly according to gender ($t=-2.52, P<0.05$), age ($F=11.58, P<0.001$), employment status ($t=-2.35, P<0.05$), and the number of colleague veterinarians ($F=5.33, P<0.01$). Females under the age of 40 years, employees, and over 6 of colleague veterinarians were vulnerable to the pressure on successful outcomes of medical treatment. The stress caused by bad working conditions were significantly different between the groups of gender ($t=3.11, P<0.01$), age ($F=6.50, P<0.001$), employment status ($t=4.63, P<0.001$), and the number of colleague veterinarians ($F=14.12, P<0.001$).

According to regression analysis (Table 2), the degree of stress was negatively correlated with job satisfaction. The stress caused by pressure on successful outcomes of medical treatment ($\beta=0.266, P<0.001$), communication with demanding clients ($\beta=0.118, P<0.01$), and bad working conditions ($\beta=0.253, P<0.001$), was negatively correlated with the job satisfaction. However, the higher the stress caused by ethical dilemma ($\beta=-0.089, P<0.05$), the lower the negative impact on job satisfaction.

Table 1. Job stress score (mean \pm standard deviation) according to the characteristics of the respondents (n=714).

		Pressure on successful outcomes of medical treatment	Ethical dilemma	Communication with demanding clients	Bad working conditions
Gender	Males	4.03(0.93)	4.00(0.75)	3.89(0.95)	3.50(0.76)
	Females	4.21(0.87)	4.00(0.80)	3.94(0.94)	3.33(0.67)
Age group	Under 35y	4.23(0.84)	3.89(0.84)	3.99(0.98)	3.31(0.76)
	35-40y	4.26(0.80)	3.98(0.77)	4.01(0.88)	3.48(0.69)
	40-45y	4.16(0.93)	4.14(0.67)	3.95(0.90)	3.57(0.67)
	45-50ys	4.03(0.84)	4.10(0.70)	4.00(0.96)	3.63(0.75)
	Over 50y	3.61(1.03)	3.90(0.77)	3.53(0.93)	3.28(0.75)
Number of colleague veterinarians	0	3.95(0.97)	4.06(0.72)	3.85(0.91)	3.56(0.73)
	1-5	4.15(0.87)	4.00(0.76)	3.94(0.94)	3.44(0.73)
	Over 6	4.22(0.84)	3.88(0.83)	3.95(1.03)	3.23(0.71)
Employment status	Owner	4.02(0.93)	4.03(0.72)	3.87(0.92)	3.52(0.73)
	Employee	4.19(0.88)	3.94(0.83)	3.97(0.99)	3.31(0.73)
Total		4.09(0.91)	4.00(0.76)	3.91(0.95)	3.45(0.74)

Section 6

Table 2. Regression analysis of the effect of job stress on job satisfaction.

Job stress	B, standard error	β	T ¹
Pressure on successful outcomes of medical treatment	0.075, 0.012	0.266	6.282***
Ethical dilemma	-0.036, 0.017	-0.089	-2.101*
Communication with demanding clients	0.156 0.118	0.118	2.685**
Bad working conditions	0.358 0.062	0.253	5.734***
R ²	0.204		
Adjusted R ²	0.198		
F	34.969***		

¹* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$.

Discussion and conclusions

The study findings showed that Korean veterinarians were under relatively high stress from pressure on successful outcomes of medical treatment, ethical dilemma, communication with demanding clients, and bad working conditions. In our study, the middle-aged male veterinarians running their own clinics and young female veterinarians hired in large hospitals may have different stress vulnerabilities. The former is more vulnerable to the bad working condition, and the latter is more vulnerable to the pressure on successful outcomes of medical treatment. The stress caused by pressure on successful outcomes of medical treatment, communication with demanding clients, and bad working conditions, has a negative effect on job satisfaction. However, stress caused by ethical dilemma does not appear to negatively affect job satisfaction. It could be explained by their reflective attitude and professionalism. Veterinarians who peruse the high standard professional ethics may be more sensitive and push themselves to reflect ethical dilemma and to make a better decision. This study suggested that specific types of stress were more susceptible to specific groups. Further research is needed to an in-depth understanding of stress types and vulnerable groups and develop coping strategies.

Acknowledgements

This extended abstract was reconstructed using part of data from Ph.D. thesis of Y. Jung in 2020.

This research was supported by Basic Science Research Program through the National Research Foundation of Korea (NRF) funded by the Ministry of Education (2021R1I1A2047656).

References

- Bartram, D.J., Baldwin, D.S., (2010). Veterinary surgeons and suicide: a structured review of possible influences on increased risk. *Veterinary Record* 166, 388-397.
- Bonini, S., Buonacucina, A., (2015). Occupational Hazards in Veterinarians: An Updating. *Journal of Veterinary Science & Technology* 7.3.
- Fritschi, L., Morrison, D., Shirangi, A., Day, L., (2009). Psychological well-being of Australian veterinarians. *Australian veterinary journal* 87, 76-81.
- Gardner, D., Hini, D., (2006). Work-related stress in the veterinary profession in New Zealand. *New Zealand Veterinary Journal* 54, 119-124.
- Hansez, I., Schins, F., Rollin, F., (2008). Occupational stress, work-home interference and burnout among Belgian veterinary practitioners. *Irish Veterinary Journal* 61, 233.

- Moses, L., Malowney, M.J., Wesley Boyd, J., (2018). Ethical conflict and moral distress in veterinary practice: A survey of North American veterinarians. *Journal of Veterinary Internal Medicine* 32, 2115-2122.
- Reijula, K., Räsänen, K., Hämäläinen, M., Juntunen, K., Lindbohm, M.L., Taskinen, H., Bergbom, B., Rinta-Jouppi, M., (2003). Work environment and occupational health of Finnish veterinarians. *American journal of industrial medicine* 44, 46-57.
- Rohlf, V.L., (2018). Interventions for occupational stress and compassion fatigue in animal care professionals – A systematic review. *Traumatology* 24, 186.
- Stafford, J., (2016). WSAVA/Hill's Next Generation Award Lecture-Veterinary Wellness: Addressing Burnout, Depression, and Suicide in the Veterinary Profession World Small Animal Veterinary Association Congress Proceedings.

53. Case discussions in a clinical ethics support service for equine medicine: a field report

M. Long¹, F. Jenner², Z. Kelemen², J.-M. Cavalleri³, U. Auer⁴ and H. Grimm¹

¹Unit of Ethics and Human-Animal Studies, Messerli Research Institute, University of Veterinary Medicine, Vienna, Medical University of Vienna, University of Vienna, Veterinaerplatz 1, 1210 Vienna, Austria; ²Equine Surgery Unit, University Equine Hospital, University of Veterinary Medicine, Vienna, Veterinaerplatz 1, 1210 Vienna, Austria; ³Equine Internal Medicine Unit, University Equine Hospital, University of Veterinary Medicine, Vienna, Veterinaerplatz 1, 1210 Vienna, Austria; ⁴Clinical Unit of Anaesthesiology and perioperative Intensive-Care Medicine, University of Veterinary Medicine, Vienna, Veterinaerplatz 1, 1210 Vienna, Austria; mariessa.long@vetmeduni.ac.at

Abstract

Clinical Ethics Support Services (CESS) have recently found their way from human into veterinary medicine to assist with ethically challenging decisions. However, literature is scarce on structures for veterinary CESS that detail what case discussions and their outcomes, in an ethics committee or with stakeholders, can look like. The aim of this work is to report and discuss a process for case discussions with stakeholders and an impartial facilitator based on experiences with a CESS in an equine hospital. We applied six steps during these case discussions: (1) introducing method and participants; (2) describing the problematic situation and associated goals; (3) collecting prospective treatment options; (4) discussing options; (5) developing an action plan with corresponding checkpoints; (6) concluding the discussion. The intended outcome of this process is agreement on an action plan which details the horse's treatment in the form of scenarios with checkpoints for evaluating treatment success at specified time points and based on clinical parameters defined in the case discussion. In combination with ethics tools, this 6-step process has the potential to be a powerful tool for supporting challenging decisions in veterinary medicine by combining metric and discourse models of decision-making and resulting in well-considered and transparent outcomes.

Keywords: facilitation, ethical challenge, veterinary ethics

Introduction

Clinical Ethics Support Services (CESS) assist with ethically challenging decisions in various contexts of medical care, such as hospitals and longterm care facilities for humans (Fournier, 2016; Stolper *et al.*, 2016) to support healthcare professionals, patients and their families with ethical challenges and to improve patient care (Molewijk *et al.*, 2016). The methods and models differ from ethics committees or lone ethicists recommending the best way forward to group dialogue-based models such as moral case deliberation (Fournier, 2016; Molewijk *et al.*, 2016).

CESS have been introduced into veterinary medicine in recent years in the form of case discussions in ethics committees. Rosoff *et al.* (2018) report the successful implementation of a multidisciplinary ethics committee at a veterinary tertiary care hospital. They offer ethics consultations upon request for challenging cases and provide recommendations through a deliberation process by members of the patient's care team and core members of the ethics committee as facilitators (Rosoff *et al.*, 2018). Moses (2018) describes working as a veterinarian offering ethics consultations outside the context of a committee in a variety of settings. These implementations of veterinary CESS highlight the relevance of such services, however, they do not yet provide a structured process for case discussions as part of a veterinary CESS.

Thus, the aim of this article is to report and discuss a 6-step-process used in case discussions with stakeholders and a facilitator as part of a veterinary CESS at an equine hospital.

The 6-Steps for case discussions

The 6-step-process (hereafter 6-Steps) for case discussions in the context of the veterinary CESS, has been developed and deployed at the equine hospital at the University of Veterinary Medicine, Vienna in the context of case discussions within the framework of the Equine Hospital Ethics Working Group (Springer *et al.*, 2018).

The case discussions took place for challenging cases on request by equine hospital staff and were attended by the treating veterinarians, veterinarians of different specialties (such as pain management, orthopaedics, etc.) that were familiar with the case, grooms, veterinary nurses, the head of the equine hospital and an ethicist as a facilitator. This inclusive group allows for veterinary students to join the discussion; however, a group size of a maximum of 12 seemed to be adequate for a productive and focussed discussion. Depending on the complexity of the case to be discussed, results could be obtained as fast as within 1 to 2 hours of discussion.

For case discussions in ethics committees we applied a six-step process: (1) introducing method and participants; (2) describing the problematic situation and associated goals; (3) collecting prospective treatment options; (4) discussing options; (5) developing an action plan with corresponding checkpoints; (6) concluding the discussion. On the basis of our experience with this procedure, important aspects of each of those steps are identified in Table 1.

Aim of the case discussion: the action plan

The intended outcome of a case discussion following the 6-Steps is agreement upon an action plan that outlines scenarios, parameters and decisions for the expected and possible results of a treatment or an intervention (Figure 1). The goal is to delineate which parameters will be assessed at which point in the treatment and what will happen as a next step depending on whether the intended result was achieved or not. Clear cut-off points are defined for when the treatment strategy should be changed or euthanasia should be performed. This prevents prolonged states of suffering of the equine patient because there is less room for adding yet another day based on not wanting to give up the hope for improvement. These difficult decisions are made in the group and based on discussions from different perspectives which reduces the uncertainty with regards to whether or not a particular treatment should be abandoned and leads to a shared responsibility by all those involved in the discussion.

If no agreement upon an action plan can be achieved during the case discussion, it still brings the benefit of clarifying the situation. Since the outcome of the case discussion in the ethics committee is by nature a recommendation, if no such recommendation can be developed the regular routines of the veterinary hospital are followed.

The role of the ethicist as a facilitator

The ethicist in the 6-Steps is an impartial facilitator and does not contribute a judgement on the case. Moral case deliberation (MCD) similarly advocates for a facilitator as a ‘Socratic midwife’ (Stolper *et al.*, 2016, p. 3) that supports the participants in uncovering moral insights and a solution to their ethical challenges without providing clear-cut judgements (Molewijk *et al.*, 2008; Porz *et al.*, 2011). A difference between the 6-Steps and MCD is that the 6-Steps focusses on the result for a particular case and any training of the participants’ competences in moral deliberation are only a welcome side-product,

Section 6

Table 1. Steps and important aspects of the 6-Steps based on experience with case discussions in an ethics committee in the context of a veterinary CESS.

Step	Important aspects
1. Introducing method and participants Facilitator introduces the process and explains the facilitator's role Participants introduce themselves and their relation to the case	Should be brief because participants are most likely eager to start and time is short
2. Describing the problematic situation and associated goals The treating veterinarian(s) provide medical information on the case (patient information (age, sex, breed etc.) medical history, diagnosis, treatment to date, complications to date, ...) The participant requesting the case discussion describes the situation and the (ethical) challenge they experience The goals for the case are clarified	No discussion of options yet Presenting participant should be able to talk without too many interruptions Other participants should have the option to contribute their knowledge about the case Shared goal to keep the discussion focussed Ethics tools can assist with clarifying the challenge (see Discussion: Between metric and discourse)
3. Collecting prospective treatment options Participants share options for the treatment of the horse going forward	All options are collected and preferably written down on a flipchart No discussion of options at this point Space for creativity
4. Discussing the options Participants discuss reasons for and against individual options Options are specified in more detail, if possible combinations are developed	Important to talk about all options Ethics tools can help with assessing the legitimacy of options (see Discussion: Between metric and discourse)
5. Developing an action plan with corresponding checkpoints An action plan with treatment steps and their intended outcome, fixed checkpoints and corresponding parameters and criteria is outlined Scenarios are developed with decisions about how to proceed for possible outcomes	Action plan needs to be specific and concrete Time, parameters and criteria for checkpoints need to be fixed Also undesired developments should be covered (e.g. deterioration, no improvement) If necessary, a date for follow-up meetings should be fixed to evaluate the case progress
6. Concluding the discussion Facilitator summarises the action plan Participants are asked for approval of the action plan Follow-up meetings (if applicable) are arranged/confirmed If no agreement on an action plan: follow-up meeting or transfer to responsible veterinarian Documentation of the action plan	Ideally, every participant agrees with the final action plan It should be clarified whether the allocated time was sufficient or whether another meeting is required due to disagreements Photos of the flipchart provide a time-efficient way to document the results

whereas MCD is also considered as a bioethics education tool (Stolper *et al.*, 2016). With the focus on a solution, the role of the facilitator in the 6-Steps comes close to that of a mediator in bioethics mediation (Bergman and Fiester, 2014; Dubler and Liebman, 2011). Bioethics mediation is similarly process-focussed and aims to achieve a consensus about outcome not necessarily values (Fiester, 2014, p. 507). The bioethics mediator provides no value judgement beyond ensuring that solutions stay within the limits of laws, institutional policies and local ethical frameworks (Bergman and Fiester, 2014). In

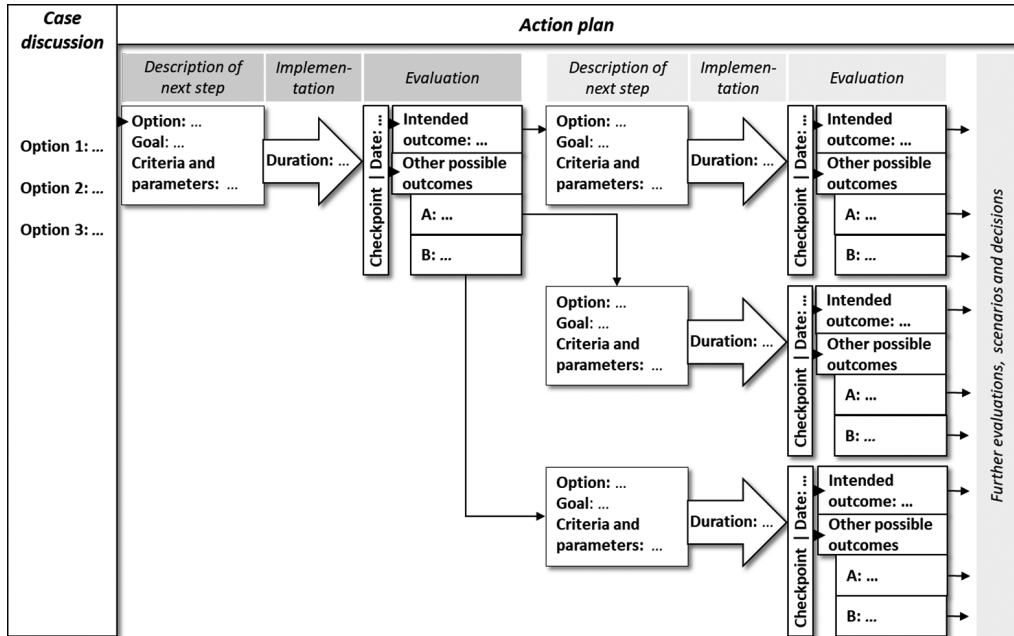


Figure 1. Template for an action plan containing checkpoints, corresponding criteria and parameters and decisions for possible scenarios as a result of the 6-Steps for case discussions.

contrast to bioethics mediation, however, the 6-Steps for case discussions does not (only) focus on disagreements or conflicts between multiple parties (Bergman and Fiester, 2014) but is also intended to assist with an internal conflict or perceived dilemma.

Discussion: between metric and discourse

The 6-Steps is brief and flexible and the action plan, tailored to the specific case, brings practical guidance and a direct benefit for decisions in veterinary practice. This helps with overcoming the challenges any veterinary CESS faces; time constraints in clinical practice, and a high work load and long working hours contributing to stress among veterinarians (Bartram *et al.*, 2009; O'Connor, 2019). Moses (2018) discusses the necessity of fast decisions in veterinary practice due to its fee-for-service model and Rosoff *et al.* (2018) highlight the speed at which ethics consultations are offered within their CESS. As a consequence of these constraints, it might seem practical to further reduce discussion time by developing a checklist or guideline with pre-determined criteria and decisions (e.g. for when to euthanise a horse), a so-called metric model (Grimm *et al.*, 2019). However, this would favour time-efficiency over context-sensitivity.

Contrary to the metric model, conducting case discussions with relevant stakeholders following the 6-Steps falls into the category of discourse models since the aim is to support the participants in finding the answer to their ethical challenge within the exchange between them. As Grimm *et al.* (2019) outline, important ideals of the discourse model are the validation of ethical judgments through social dialogue and that disagreements 'can be argued out between fair-minded people' (Grimm *et al.*, 2019, p.23). The 6-Steps shares this view that the stakeholders are the ones most capable to develop a solution to their challenges while the ethicist is guiding the process without acting as a moral expert.

Section 6

Compared to a metric approach with set criteria and decisions, the discourse model offers clear advantages, such as the flexibility and context-sensitivity of the solutions developed within case discussions and the clear accountability of the members of the committee for value judgements and the outcome of the discussion, but also disadvantages, such as the influence of social and professional roles and the limited transparency of criteria (Grimm *et al.*, 2019). Therefore, a combination of discourse and metric model would be the best way forward, namely a set of criteria (metric) that guides the dialogue (discourse) (Grimm *et al.*, 2019). For the case discussions following the 6-Steps, this entails outlining the criteria or questions to discuss with regards to possible treatment options. The Ethics Working Group is currently developing a set of questions to be addressed during the case discussion within the ethics committee but also in earlier stages like ward rounds. The questions emphasise the impact of treatment options on the horse by for example drawing attention to pain levels and the overall quality of life of the horse.

Ethics tools and frameworks such as the Ethical Matrix (Mepham *et al.*, 2006), the four principles of biomedical ethics (Beauchamp and Childress, 2009) or the veterinary ethics tool (VET) (Grimm *et al.*, 2018) can support the process mainly at two stages during the case discussion; during step (2) 'describing the problematic situation and associated goals' they can help to illuminate and specify the challenge; during step (4) 'discussing options' they can assist in reflecting upon the legitimacy of the different options, e.g. by including perspectives of absent stakeholders (Jensen *et al.*, 2011) or by providing questions and input with regards to the justificatory value of reasons (Grimm *et al.*, 2018). Their application should be considered based on the requirements of a specific case and the tool's theoretical foundations.

Transparency of the process can be attained by implementing a standard operating procedure (SOP) for critical or challenging cases. Such an SOP is currently under development at the equine hospital at the University of Veterinary Medicine, Vienna, and will, for example, delineate when and how case discussions are convened. Transparency is important, also since the final decision about the treatment rests with the patient owner, who is (typically) not present during the case discussion and who might disagree with conclusions from the discussion. Nevertheless, the case discussion and the action plan can then function as a basis for discussion with the patient owner. And if financial constraints or owner wishes are known, they should be part of the case discussion as they can speak for or against treatment options.

Another challenge for implementing the 6-Steps is that access to multiple experts, perspectives and a qualified facilitator is more difficult for veterinarians working alone outside the scope of veterinary hospitals with access to academic institutions, such as equine practitioners in a mobile practice. A way forward could be to offer case discussions via online meetings that can make the service more accessible.

Conclusions

Case discussions using the 6-Steps presented here allow for a practical, well-considered and transparent veterinary CESS in a veterinary hospital that combines the metric and the discourse model. The case discussion itself, however, is only one aspect of a CESS. Other important aspects include the transparent selection of the participants and a qualified facilitator and a clear, easily accessible process for requesting an ethical case discussion. Therefore, it is necessary to embed the case discussions into a wider strategy for a CESS that also considers challenges regarding the implementation process and allows for evaluations of its success.

References

- Bartram, D.J., Yadegarfar, G., Baldwin, D.S., (2009). Psychosocial working conditions and work-related stressors among UK veterinary surgeons. *Occupational Medicine* 59: 334-341.
- Beauchamp, T.L., Childress, J.F., (2009). *Principles of biomedical ethics*, 6th ed. Oxford University Press, New York, USA.
- Bergman, E.J., Fiester, A., (2014). The future of clinical ethics education: value pluralism, communication, and mediation. In: Akabayashi, A. (ed.), *The future of bioethics: international dialogues*. Oxford University Press, Oxford, UK, pp. 703-711.
- Dubler, N.N., Liebman, C.B., (2011). *Bioethics mediation: a guide to shaping shared solutions*, revised and expanded edition. Vanderbilt University Press, Nashville, USA.
- Fiester, A., (2014). Bioethics mediation & the end of clinical ethics as we know it. *Cardozo Journal of Conflict Resolution* 15.2: 501-513.
- Fournier, V., (2016). Clinical ethics: methods. In: ten Have, H. (ed.), *Encyclopedia of global bioethics*. Springer International Publishing, Cham, Switzerland, pp. 553-562.
- Grimm, H., Bergadano, A., Musk, G.C., Otto, K., Taylor, P.M., Duncan, J.C., (2018). Drawing the line in clinical treatment of companion animals: recommendations from an ethics working party. *Veterinary Record* 182: 664.
- Grimm, H., Olsson, I.A.S., Sandøe, P., (2019). Harm-benefit analysis – what is the added value? A review of alternative strategies for weighing harms and benefits as part of the assessment of animal research. *Laboratory Animals* 53: 17-27.
- Jensen, K.K., Forsberg, E.-M., Gamborg, C., Millar, K., Sandøe, P., (2011). Facilitating ethical reflection among scientists using the ethical matrix. *Science and Engineering Ethics* 17: 425-445.
- Mephram, B., Kaiser, M., Thorstensen, E., Tomkins, S., Millar, K., (2006). *Ethical Matrix manual*. LEI, The Hague, The Netherlands.
- Molewijk, B., Slowther, A., Aulisio, M., (2016). Clinical ethics: support. In: ten Have, H. (ed.), *Encyclopedia of global bioethics*. Springer International Publishing, Cham, Switzerland, pp. 562-570.
- Molewijk, B., van Zadelhoff, E., Lendemeijer, B., Widdershoven, G., (2008). Implementing moral case deliberation in Dutch health care; improving moral competency of professionals and the quality of care. *Bioethica Forum* 1: 57-65.
- Moses, L., (2018). Another experience in resolving veterinary ethical dilemmas: observations from a veterinarian performing ethics consultation. *The American Journal of Bioethics* 18: 67-69.
- O'Connor, E., (2019). Sources of work stress in veterinary practice in the UK. *Veterinary Record* 184: 588.
- Porz, R., Landeweer, E., Widdershoven, G., (2011). Theory and practice of clinical ethics support services: narrative and hermeneutical perspectives. *Bioethics* 25: 354-360.
- Rosoff, P.M., Moga, J., Keene, B., Adin, C., Fogle, C., Ruderman, R., Hopkinso, H., Weyhrauch, C., (2018). Resolving ethical dilemmas in a tertiary care veterinary specialty hospital: adaptation of the human clinical consultation committee model. *The American Journal of Bioethics* 18: 41-53.
- Springer, S., Auer, U., Jenner, F., Grimm, H., (2018). Clinical ethics support services in veterinary practice. In: Springer, S., Grimm, H. (eds.), *Professionals in Food Chains. Proceedings of the 14th Congress of the European Society for Agricultural and Food Ethics*, June 13-16, 2018. Wageningen Academic Publishers, Wageningen, the Netherlands, pp. 308-313.
- Stolper, M., Molewijk, B., Widdershoven, G., (2016). Bioethics education in clinical settings: theory and practice of the dilemma method of moral case deliberation. *BMC Med Ethics* 17: 45.

https://www.wageningenacademic.com/doi/book/10.3920/978-90-8686-939-8 - Wednesday, December 14, 2022 7:49:12 AM - IP Address: 185.128.124.75

54. Veterinarians as key intermediaries in sustainability discourse(s)

A. Nelke¹, K. Persson^{1*}, F. Selter² and T. Weber¹

¹*Applied Ethics in Veterinary Medicine Group, Institute for Animal Hygiene, Animal Welfare and Farm Animal Behaviour, University of Veterinary Medicine Hannover, Foundation, Bischofsholer Damm 15, 30173 Hanover, Germany;* ²*Institute for Ethics, History and Philosophy of Medicine, Hannover Medical School, Carl-Neuberg-Str. 1, 30625 Hanover, Germany; kirsten.persson@tiho-hannover.de*

Abstract

The veterinarians' potential role as stakeholders in the multifaceted sustainability discourse has hardly been carved out so far. We present different scientific angles to approach urgent questions regarding the intertwining of the veterinary profession and the goals for sustainable development by the UN. We address the following aspects regarding six of the 17 goals: Being involved in farm animal husbandry, a major source of greenhouse gas emissions, veterinarians are able to contribute to Sustainable Development Goal (SDG) 13, 'Climate Action' and SDG 12, 'Responsible Consumption and Production'. As advocates for animals, veterinarians might feel responsible for SDG 15 'Life on Land' as many non-domesticated animals will suffer from the consequences of global warming. As stakeholders in One Health endeavours, veterinarians are additionally involved in SDG 2, 'Zero Hunger' and SDG 3, 'Good Health and Wellbeing'. Furthermore, demands due to different SDGs might put additional strain on veterinarians' mental health. Finally, regarding SDG 4, 'Quality Education' we address important gaps regarding sustainability and One Health in veterinary curricula. Based on the listed connections with facets of sustainability we discuss the (potential) role of veterinarians in the sustainability discourse and suggest opportunities for future empirical research.

Keywords: climate change, sustainable development goals, veterinary education, one health

Introduction

The veterinarians' potential role as stakeholders in the diverse sustainability discourses has hardly been carved out so far. We present different scientific angles to approach urgent questions regarding the intertwining of the veterinary profession and sustainability.

The already noticeable effects of climate change and the sustainability discourse that goes beyond them are calling an increasingly broad spectrum of actors to the table. Global climate change affects each of the three established dimensions of the concept of sustainability: economic, ecological, and social. Ecological, economic, and social crises are accompanied by a threat to human health; the expertise to address this problem is therefore in the hands of various scientific disciplines. Veterinarians have a uniquely important role to play in this field of tension, but this is hardly reflected in the public perception. This interface role is particularly evident in the One Health approach. It is fundamentally based on the recognition that human, animal, and environmental health are closely interlinked (WHO, 2017).

Rather than a narrow definition of 'sustainability', we propose the orientation to the 17 sustainable development goals by the UN. Thus, we have identified, on the one hand, those sustainable development goals that veterinarians are obviously or could most likely be involved with. Our list is by no means exhaustive and further linkages between the veterinary profession and the remaining goals may exist. On the other hand, we detected crucial research gaps regarding that matter that should be approached in future scientific endeavours. We aim at addressing the overarching questions of the extent to which veterinary expertise can make a significant contribution to the sustainability discourse and the extent to

which there is a need – in terms of training, psychology, and infrastructure, among other things – for veterinarians to be able to do justice to their roles in this discourse.

SDG 13: Climate Action. Take urgent action to combat climate change and its impacts. & SDG 12: Responsible Consumption and Production. Ensure sustainable consumption and production patterns

The close connection between veterinary medicine and agriculture is obvious here. Farm animal husbandry plays a key role in the sustainability discourse. On the one hand, it is considered a central cause of climate change. CO₂ and especially methane as by-products of farming accelerate global warming. A considerable percentage of human-made greenhouse gas emissions are currently associated with farming and, in particular, animal husbandry (Steinfeld, 2006). On the other hand, however, agriculture is also a central loser of climate change, the consequences of which farmers already have to deal with today. Extreme weather conditions endanger harvests as well as feed and water supplies, animals die more frequently from overheating in stables that are not designed to withstand such extreme temperatures, and feed quality deteriorates (Rojas-Downing *et al.*, 2017). Conservation organizations, but also the public and politicians as well as physicians call for a societal rethinking of nutrition, among other things, in order to reduce emissions of climate-damaging carbon dioxide and prevent possible health hazards for the global population (Hommel, 2019, European Commission, 2022)

In particular those veterinarians working in agricultural animal husbandry have a special responsibility here: They are experts in animal health, nutrition, husbandry systems, and animal welfare. They advise farmers on how to change the way animals are used and are actively involved in research in these areas. Furthermore, they are jointly responsible for human health in accordance with the Code of Ethics, for example in the areas of food safety and zoonoses (see below).

SDG 15: Life on Land. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

In addition to direct effects, climate change will have an indirect impact on animal health because, for example, pathogenic germs and parasites generally multiply at higher temperatures, or because disease-transmitting vectors may spread more widely. Deem *et al.* (2019) specifically mention the influences of ‘changing land use’, ‘agro-industrial changes’, ‘food-industrial changes’, and ‘climate and weather’ in their model of sources of infection in the globalized world. Veterinarians, as ‘animal advocates’, may feel responsible for members of the animal kingdom beyond those individuals they encounter in veterinary practice. What is called ‘biodiversity loss’ in the 15th goal includes the death of numerous animal individuals who are no longer equipped to survive in their changing habitat.

SDG 3: Good Health and Well-Being. Ensure healthy lives and promote well-being for all at all ages. & SDG 2: Zero Hunger. End hunger, achieve food security and improved nutrition and promote sustainable agriculture

Global warming is repeatedly associated with the occurrence of certain zoonoses as well as concerns regarding the corresponding use of antibiotics (Deem *et al.*, 2019), which in turn pose a major threat to the human and animal population. For example, it has been pointed out repeatedly in the past – not only in the context of the COVID-19 pandemic – that the reduction of wildlife habitat and the resulting unavoidable contact of infected wildlife with livestock pose a major threat to global health (Rojas-Downing *et al.*, 2017). Antibiotic resistance is significantly more common in warmer regions than in areas with lower outdoor temperatures (MacFadden *et al.*, 2018). Thus, it is reasonable to assume

Section 6

that global warming as a result of climate change may also be associated with increased occurrences of antibiotic resistance in the future, presenting a major challenge for global animal and human health.

Within the framework of the One Health concept, the connection between the health of humans, animals and the environment is investigated and at the same time established as guidance for decisions and actions. However, it can be observed that positions regarding the normative implications of the One Health approach sometimes differ strongly from each other, depending on the underlying 'agenda'. Accordingly, the demands of those veterinarians and other actors who are referring to the One Health approach may differ. To give just two examples: The WHO defines the goal of One Health as 'better public health outcomes' (WHO, 2017), whereas the One Health Initiative Task Force states 'optimal health for people, animals and our environment' (AVMA, 2008, 13). In this article, goal 3 is understood as inclusive: 'well-being for all at all ages' should include human and animal lives. In agriculture, the issues that arise in this context are particularly evident. They include, as mentioned above, the high environmental impact of animal husbandry, extreme effects of climatic changes on animal welfare, increased risk in food hygiene or the spread of diseases, and thus an increased risk to the food security and health of the population.

Health, however, can be understood in an additional way, here. The 2017 version of the Geneva Declaration states that human health professionals should take care of their own health and well-being in order to provide the highest level of care. This can also be applied to veterinarians. Maintaining one's own health and thus one's own performance corresponds to sustainable professional action.

However, as further elaborated below, veterinarians find themselves particularly and presumably increasingly in a field of tension of various stakeholder interests, which can result in negative effects on their mental health. Already, suicide rates that deviate sharply upward from the population average and above-average mental distress among veterinary professionals are evident (Hatch *et al.*, 2011; Nett *et al.*, 2015; Platt *et al.*, 2010, 2012; Skipper and Williams, 2021). Maintaining one's own (mental) health and professional satisfaction will be a major challenge for current and future veterinarians in the changing veterinary profession.

Systematic research, especially with regard to the education of the future generation of veterinarians and their specific professional challenges with regard to the sustainable development goals, has not yet been conducted and presents an opportunity for future research.

SDG 4: Quality Education. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

This goal is understood in a very wide sense here, tackling apparent deficits in veterinary education. Despite the crucial role of veterinary medicine in the sustainability discourse, sustainability, climate protection and One Health are not an integral part of veterinary curricula. Recent research points to both a student need for courses on these topics and the gaps in the education system in this regard (Pollard *et al.*, 2020). This is surprising given that a stronger integration of the One Health approach, or even a comprehensive revision of veterinary curricula based on One Health, has been called for repeatedly in the past (see Lerner and Berg, 2015).

This need on the part of the student body is also evident in the example that the initial impetus for this article came from a lecture. Following a lecture by the one of the authors on 'Farm Animal Husbandry and Climate Change', the attending veterinary students and graduates discussed their own role, challenges, and possibilities for action in the sustainability debate. They emphasised the potential

of veterinary research as well as deficits in its public visibility. Explicit wishes and suggestions to open veterinary curricula to the interdisciplinary sustainability discourse were also made. The presence of sustainability issues also in veterinary professional practice is reflected in the demand, already expressed elsewhere (<https://vetsustain.org/about>, Mair *et al.*, 2021), for educational events on implementation and communication strategies related to aspects of ecological sustainability.

The veterinarians' role in the sustainability discourse

The field of tension in the veterinary profession

As demonstrated above, veterinarians have a particularly important, but at the same time very tense function in the sustainability discourse which (at least some) veterinarians perceive as such themselves (www.vetsustain.org). They are committed to the health and well-being of their animal patients, but always must take into account the individual situation of the animal owners. Veterinarians are also active in an advisory manner. Beyond that, they must keep in mind their own (economic and health-related, among other things) interests. And last but not least, according to the Code of Ethics of Veterinarians (<https://www.bundestieraerztekammer.de/btk/ethik/>), they are committed to the health of humans and the ecosystem in the sense of the One Health concept and are explicitly encouraged to consider sustainability aspects in their everyday professional life: 'We veterinarians serve the common good and [...] take into account the ecological, economic and social consequences of our actions in the sense of sustainable development.' (German Veterinarian Code of Ethics §1, item 6, translated by the authors).

The tension between the well-being of the patient animal, the client/animal keeper and the societal interest in low food prices, safety, or certain quality of animal products, which is characteristic for their profession and manifested by this self-commitment, culminates in the requirements that are becoming more acute in every respect due to sustainable development goals. Not in every case, the consideration of animal needs, economic conditions of the clients, heterogeneous social interests, and necessities with regard to a resource-saving, low-emission agriculture results in a balanced solution. This is particularly evident in intensive animal husbandry with overall compressed land use through high animal numbers, mostly indoors, which is discussed as both the rather most environmentally friendly use of 'food animals' and at the same time a multi-channel source of suffering and risks for the environment, humans, and animals (Deem *et al.*, 2019).

The veterinarian voice in public debate and the media

In the debate on sustainability goals, which is often portrayed as highly polarized through the media, One Health (sometimes referred to as Planetary Health) aims to provide an integrating response. In the media, stakeholders from opposing fields often have their say: NGOs, which particularly focus on resource protection, representatives from industry and agriculture, who usually have the role of emphasising economic interests, scientists, who are supposed to contribute to the discussion with data and their interpretation, politicians, who weight the aforementioned perspectives differently, and some others. Theoretically, veterinary medicine – also in its different subdisciplines/specializations – ties in with several of these areas: as a representative of animal interests and co-responsible for human health, it can make animal and environmental aspects strong. Its financial dependence on agriculture would allow it to act alongside agricultural economists. Veterinary research, in turn, can make its own innovative scientific contributions to achieving sustainability goals. Thus, veterinarians cannot be clearly assigned to one of the 'poles' and – at least according to our hypothesis that still calls for further research – remain largely unheard despite the presented, multi-perspective and possibly indispensable competence and responsibility for the discourse.

Section 6

The 'sustainability-transformation' of the veterinary profession

In the course of the changes in agriculture that are advancing for reasons of climate protection, especially with regard to animal husbandry and human nutrition, there is a demographic transformation of the veterinary medical profession.

The call, prominent in social and political debates, for reducing numbers of farm animals and animal products could cost veterinary jobs. At the same time, the development of alternative protein sources offers potential new professional and research fields for veterinary medicine, such as *in vitro* meat (also for feed production for pets) or food insects. With increasing threats to wildlife due to climate change impacts, the veterinary profession must also ask itself to what extent the welfare of those animals falls within its sphere of responsibility. In addition, the threat to human health posed by zoonotic diseases has come to the public's attention, especially in the current pandemic situation. An increasing number of zoonoses can be expected in conjunction with increasing land use and climatic changes (UNEP and ILRI, 2020). Thus, there will be an even stronger demand for veterinary expertise in the future when it comes to preventing infections from independently living, culture-following or companion animals to livestock, companion animals and ultimately humans. The extent to which a new professional image and a correspondingly transformed self-image will emerge here, especially among those veterinarians who still have the majority of their professional life ahead of them, will thus represent a further object for research.

Ideas for future research

The focus on veterinary medicine, its special responsibilities and opportunities at the interface between different actors in the sustainability discourse, therefore, seems more urgent than ever, not only with regard to present issues such as zoonoses or multi-resistant germs. Future empirical research is pivotal to clarify the professional roles and consequences veterinarians see for themselves regarding the goals of sustainable development, in addition to research on the perspectives of the public and the media in this respect.

References

- American Veterinary Medical Association. (2008). One health: a new professional imperative. One health initiative task force of the AVMA. https://www.avma.org/KB/Resources/Reports/Documents/onehealth_final.pdf.
- Bundestierärztekammer: Ethikkodex. Available at: <https://www.bundestieraerztekammer.de/btk/ethik/> Accessed 10 June 2021.
- Deem, S.L., Lane-deGraaf, K.E. and Rayhel, E.A. (2019). Introduction to one health: An interdisciplinary approach to planetary health. John Wiley and Sons.
- European Commission: Farm to Fork Strategy. For a fair, healthy and environmentally-friendly food system. Available at: https://ec.europa.eu/food/horizontal-topics/farm-fork-strategy_en.
- Hatch, P.H., Winefield, H.R., Christie, B.A. and Lievaart, J.J. (2011). Workplace stress, mental health, and burnout of veterinarians in Australia. *Australian veterinary journal*, 89(11), 460-468. <https://doi.org/10.1111/j.1751-0813.2011.00833.x>
- Lerner, H. and Berg, C. (2015). The concept of health in One Health and some practical implications for research and education: What is One Health? *Infection Ecology and Epidemiology*, 5(1), 25300. <https://doi.org/10.3402/iee.v5.25300>
- MacFadden, D.R.; McGough, S.F.; Fisman, D.; Santillana, M.; Brownstein, J.S. (2018). Antibiotic Resistance Increases with Local Temperature. *Nature Climate Change*, 8(6), 510-514. <https://doi.org/10.1038/s41558-018-0161-6>
- Mair, T.S., Janska, S. and Higham, L.E. (2021). Sustainability in equine veterinary practice: A survey of opinions and practices amongst veterinary teams in the United Kingdom. *Equine Veterinary Education*, 33(11), e445-e448. <https://doi.org/10.1111/eve.13565>

- Nett, R.J., Witte, T.K., Holzbauer, S.M., Elchos, B.L., Campagnolo, E.R., Musgrave, K.J., ... and Funk, R.H. (2015). Risk factors for suicide, attitudes toward mental illness, and practice-related stressors among US veterinarians. *Journal of the American Veterinary Medical Association*, 247(8), 945-955. <https://doi.org/10.2460/javma.247.8.945>
- Platt, B., Hawton, K., Simkin, S. and Mellanby, R.J. (2010). Systematic review of the prevalence of suicide in veterinary surgeons. *Occupational Medicine*, 60(6), 436-446.
- Platt, B., Hawton, K., Simkin, S. and Mellanby, R.J. (2012). Suicidal behaviour and psychosocial problems in veterinary surgeons: a systematic review. *Social psychiatry and psychiatric epidemiology*, 47(2), 223-240. <https://doi.org/10.1093/occmed/kqq044>
- Pollard, Anna E.; Rowilson, Daena L.; Kohnen, Allison; McGuffin, Kaitlin; Geldert, Christina; Kramer, Collin *et al.* (2020): Preparing Veterinarians to Address the Health Impacts of Climate Change. Student Perceptions, Knowledge Gaps, and Opportunities. In *Journal of Veterinary Medical Education*, e20190080. <https://doi.org/10.3138/jvme-2019-0080>
- Rojas-Downing, M.M.; Nejadhashemi, A.P.; Harrigan, T.; Woznicki, S.A. (2017). Climate change and livestock: Impacts, adaptation, and mitigation. *Climate Risk Management*, 16,145-163. <http://dx.doi.org/10.1016/j.crm.2017.02.001>
- Skipper, G.E. and Williams, J.B. (2012). Failure to acknowledge high suicide risk among veterinarians. *Journal of veterinary medical education*, 39(1), 79-82. <https://doi.org/10.3138/jvme.0311.034R>
- Steinfeld, H., Gerber, P., Wassenaar, T.D., Castel, V., Rosales, M., Rosales, M. and de Haan, C. (2006). *Livestock's long shadow: environmental issues and options*. Food and Agriculture Org.
- United Nations Environment Programme and International Livestock Research Institute (2020). *Preventing the Next Pandemic: Zoonotic Diseases and How to Break the Chain of Transmission*. <https://wedocs.unep.org/bitstream/handle/20.500.11822/32316/ZP.pdf> accessed 25.02.2022
- World Health Organisation (2017). *One Health*. World Health Organization. 21.09.2017. <https://www.who.int/news-room/q-a-detail/one-health>.

55. What would you do – a transnational study on veterinarians' recommendations concerning radiotherapy in dogs and cats with cancer

S. Springer^{1,2*}, T. Bøker Lund², P. Sandøe^{2,3}, H. Grimm¹, S.A. Corr⁴ and A.T. Kristensen⁵

¹Messerli Research Institute, Veterinaerplatz 1, 1021 Vienna, Austria; ²Department of Food and Resource Economics, University of Copenhagen, Rolighedsvej 23, 1958 Frederiksberg, Denmark; ³Department of Veterinary and Animal Sciences, University of Copenhagen, Grønnegårdsvej 15, 1870 Frederiksberg, Denmark; ⁴Division of Small Animal Clinical Sciences, School of Veterinary Medicine, University of Glasgow, 464 Bearsden Road, G61 1QH Glasgow, Scotland, United Kingdom; ⁵Department of Veterinary Clinical Sciences, University of Copenhagen, Dyrlegevej 16, 1870 Frederiksberg, Denmark; svenja.springer@vetmeduni.ac.at

Abstract

The field of veterinary oncology has advanced greatly over the last decade, and veterinarians have an important role in advising owners on whether and when certain treatments, such as radiotherapy, are indicated for dogs and cats. Using an online questionnaire (N=636), we investigated what treatment Austrian, Danish and UK veterinarians would recommend for a cat and a dog in a disease scenario where adjunctive radiotherapy would be optimal (a cat with a feline injection-site sarcoma and a dog with a soft tissue sarcoma). In both scenarios, around 40% of the veterinarians suggested radiotherapy, around 10% advised against it and around 27% did not make any recommendation. No significant differences were found in the advice given based on species. However, we identified that Danish veterinarians were significantly less likely to suggest radiotherapy compared to their UK and Austrian colleagues. Further, we found that veterinarians with additional qualifications or a greater interest in advancing veterinary medicine were more likely to recommend radiotherapy. Even though veterinarians would recommend radiotherapy for both species equally, the fact that approximately one quarter of veterinarians would not make any recommendation raises a potential ethical challenge since it may lead to different access of treatment for animal patients suffering from cancer.

Keywords: veterinary oncology, radiotherapy, small animal medicine, dogs and cats, questionnaire-based study

Introduction

The field of small animal medicine has advanced greatly with respect to therapeutic options which enable veterinarians to treat patients that could not be helped some years ago. In particular, the field of oncology has become established as a highly specialized field (LaRue and Custis, 2014; McEntee, 2014; Hamilton and Hortobagyi, 2005). Even though recent advancements positively impacted on the care of canine and feline cancer patients (LaRue and Cutis, 2014; Hamilton and Hortobagyi, 2005), concerns have also been raised in relation to potentially adverse consequences for both the patient (e.g. the occurrence of adverse-effects and related burden) and the animal owner (e.g. financial costs and time).

In relation to this, recent studies focus on owners' perceptions concerning cancer treatments for animals (Smith *et al.*, 2019; Fan *et al.*, 2018; Denneberg and Engevall, 2009; Brønden *et al.*, 2003). For instance, Denneberg and Engevall (2009) interviewed 23 owners whose dogs were treated with radiotherapy. Even though eleven (48%) of the 23 owners indicated that radiotherapy did not cure the dog's cancer, all owners agreed that radiotherapy was worthwhile in terms of their commitment (e.g. time for travel

and care, financial cost), and that the benefit outweighed the temporary discomfort to their dog. This agrees with the findings of a study including owners of 95 dogs, 21 cats and two rabbits, which reported that 79% of owners were satisfied with radiotherapy (Fan *et al.*, 2018). However, the level of satisfaction was significantly higher for those owners who observed an improvement in the animals' quality of life (Fan *et al.*, 2018).

Further, Smith *et al.* (2019) conducted a prospective study including 49 owners of dogs and cats suffering from various types of cancer. They assessed owners' concerns with respect to adverse effects, and how these concerns changed when the treatment included radiotherapy. Their findings showed that owners were significantly less concerned about possible adverse effects after the animal went through this therapy (Smith *et al.*, 2019). Based on their results, Smith *et al.* (2019) encouraged veterinarians to proactively address owners' concerns in order to allow more owners to feel comfortable in pursuing radiotherapy for their pet.

There is no doubt that veterinarians play an important role when caring for pets with cancer. Theoretical considerations have been published highlighting the importance of various aspects that veterinarians should address. For instance, and unsurprisingly, Chun and Garret (2007) point out that clear communication between the cancer treatment team and the client is a key to successful care for clients of pets with cancer. Moore (2011) addresses further considerations including the best interest of the patient, cost burden for the client or concerns that arise from novel therapies and research in the field of oncology. However, whereas studies exist focusing on the owners' perception, only one empirical study exists shedding light on veterinarians' attitudes towards radiotherapy. Denneberg and Engevall (2009) surveyed 67 veterinarians and found that veterinarians who attended further trainings in the field of oncology showed a higher score in relation to a positive attitude towards radiotherapy and assumptions about the quality of life of dogs undergoing radiotherapy. It comes as no surprise that the inclination to recommend radiotherapy was slightly higher for veterinarians who had additional training in oncology (Denneberg and Engevall, 2009).

The finding that post-graduate education has an effect on whether the veterinarian would recommend radiotherapy is of particular relevance, as veterinarians play a key advisory role for clients with cancer patients. Against this background, the comparative study presented here aimed to identify whether veterinarians would recommend radiotherapy for a cat with a feline injection-site sarcoma and a dog with a soft tissue sarcoma, and whether factors related to the animal and the veterinarian had an effect on their recommendation. For instance, it may be assumed that not only veterinarians' educational level, but also their age, employment status, the practice type or their aspiration to advance veterinary medicine could have an impact on their treatment recommendations.

In relation to this, Springer *et al.* (2021) empirically identified four 'decision ethics orientations' (DEOs): the patient-focused, the client-empathetic, the client-devolved and development-oriented DEO. Each of these emphasize different interests related to the animal, the client and the veterinarian in shaping clinical decision-making processes. The development-oriented DEO centres on the idea that it is important to advance small animal medicine, and in this context, we hypothesized that veterinarians who are keen to advance small animal medicine would be more likely to recommend radiotherapy. Several recent studies focus on owners' perceptions regarding radiotherapy (cf. Smith *et al.*, 2019; Fan *et al.*, 2018; Denneberg and Engevall, 2009), but no study exists on whether veterinarians' treatment recommendations would differ for dogs and cats, and the present study aimed to investigate this in relation to radiotherapy.

Therefore, the current study addresses the following research questions: (1) What proportion of veterinarians would recommend radiotherapy for a cat with a feline injection-site sarcoma or a dog with a soft tissue sarcoma, and does this differ between the three countries? (2) Does the animal

Section 6

species (dog vs cat), or veterinarian related factors such as veterinarians' country of work, additional educational programmes or their aspiration to advance veterinary medicine have an impact on their recommendations?

Material and methods

Study population, recruitment and study participants

In cooperation with veterinary associations in Austria (VÖK), Denmark (DVA) and the UK (BSAVA) the link to the online questionnaires was sent to 1,195 Austrian, 1,287 Danish, and 5,138 UK small animal veterinarians. For Denmark and Austria, data were collected from 2nd March and 9th April 2020. For the UK, the survey was open between 30th March until 7th May 2020. The study received ethical approval from the Research Ethics Committee of SCIENCE and HEALTH at the University of Copenhagen (ReF: 504-0114/19-5000). Questionnaires in which the sections relevant to this paper were completed were received from 636 veterinarians (101 (15.9%) from Austria, 171 (26.9%) from Denmark; 364 (57.2%) from the UK).

Survey design and measurements

The present study used a subset of data from a larger questionnaire survey (Springer *et al.*, 2021; 2022) that included questions on socio-demographic and practice-specific factors. The data reported in this paper is based on two clinical scenarios: respondents were randomly allocated to receive either the scenario of a cat with feline injection-site sarcoma (317, 49.8%) or a dog with soft tissue sarcoma (319, 50.2%). In both scenarios radical surgical excision of the tumour is performed, but histopathology identifies dirty margins, therefore radiotherapy would reduce the risk of recurrence. In both scenarios the owner asks the veterinarian: 'What would you do, if it was your dog / cat?'. The respondents could choose between the following options: 'I would recommend radiotherapy (and refer the patient)', 'I would recommend against radiotherapy', 'I would not make any recommendation regarding radiotherapy' and 'Other'.

Data analysis

The online surveys were set up using the survey software Alchemer®, and IBM SPSS Statistics version 27 was used in all analyses. Univariate descriptive statistics were presented in tables or text. Chi-square tests were conducted to determine whether veterinarians' recommendations differed between the three countries as well as between the dog and cat scenario. Bonferroni correction was applied for all multiple comparisons between the three countries. The significance level was 0.05. Data from the dog and cat scenario were then pooled, and logistic regression analysis were run to examine whether the animal species and factors related to the veterinarian were associated with whether or not radiotherapy would be recommended. The dependent variable was inserted on a dichotomous scale (1='I would recommend radiotherapy (and refer the patient)'; 0='I would recommend against radiotherapy' and 'I would not make any recommendation regarding radiotherapy' and 'Other'). The five categorical predictor variables were: (1) animal species (1=dog, 2=cat); (2) gender (1=male, 2=female); (3) business type (1=independently owned, 2=corporate owned); (4) employment type (1=self-employed; 2=employed); and (5) qualification (1=additional postgraduate qualification, 2=no postgraduate qualification). In addition, age (range: 23-83 years) and the four DEOs were inserted as continuous variables.

Results

Recommendations for radiotherapy in dogs and cats with cancer

Table 1 presents veterinarians' recommendations for radiotherapy for the dog and the cat scenario respectively. A comparison between Austria, Denmark and the UK showed significant differences. In both scenarios, Danish veterinarians were more likely to recommend against radiotherapy than their UK colleagues ($P_{\text{dog}}=0.006$, $P_{\text{cat}}<0.001$). Further, UK veterinarians were more likely to recommend radiotherapy for the cat with cancer compared to Danish veterinarians ($P<0.001$). When comparing species recommendations per country however, no significant differences were identified (AT: $\chi^2(3)=1.284$, $P=0.733$; DK: $\chi^2(3)=1.031$, $P=0.794$; UK: $\chi^2(3)=1.456$, $P=0.693$).

What explains veterinarians' recommendations for radiotherapy?

Logistic regression analysis indicates that various factors related to the veterinarians and their working environment resulted in significant differences in their treatment recommendations ($\chi^2(2)=5.754$, $P=0.056$). We identified that Danish veterinarians were less likely to recommend radiotherapy compared to their Austrian ($P=0.013$) and UK ($P<0.001$) colleagues. Further, analyses indicated that employed veterinarians ($P=0.048$), those with additional qualifications ($P=0.015$) and a higher score in the development-oriented DEO ($P=0.008$) were more likely to recommend radiotherapy than self-employed veterinarians and veterinarians without any postgraduate qualifications. Interestingly however, veterinarians' recommendations did not differ based on whether the patient is a dog or a cat ($P=0.893$).

Discussion

Results of this comparative study provide the first insights into veterinarians' recommendations concerning radiotherapy in either dogs or cats with cancer. The scenarios were chosen to highlight situations in which adjunctive radiotherapy following surgical resection would be beneficial from a therapeutic point of view. Yet up to nearly a third of the veterinarians in this study would not make any recommendations regarding radiotherapy in either the cat (21.2 up to 29.8%) or dog (22.9 up to 33.3%) scenario. We speculate that there are three possible explanations for this.

One possible explanation relates to the way in which the question is asked by the owner: 'What would you do, if it was your dog / cat?'. Owners will often ask this of vets in a variety of clinical scenarios, and it raises a number of different concerns. As discussed by Christiansen (2016), these include the fact that circumstances and ethical values of the veterinarian and owner may differ, along with concerns about client autonomy, where clients are expected to make their own decisions based on information provided, or the lack of a shared decision-making process. Another explanation may therefore be that veterinarians do not think that it is their responsibility to give any recommendation in relation to advanced treatment options such as radiotherapy, but to simply provide the information, and allow the owner to decide, respecting owner autonomy. A third explanation is simply that some veterinarians may not have enough experience, or feel well informed enough about radiotherapy, to advise for or against it. These possible motivations should be explored in further research.

However, for the veterinarians who took a clear stance by either recommend for radiotherapy or recommend against it, it became apparent that in all three countries, in both scenarios, a higher percentage would recommend radiotherapy. However there were significant differences between Danish and UK veterinarians, as UK veterinarians would significantly more often recommend radiotherapy for both species compared to their Danish colleagues. A possible explanation for this might lie in the structural organization of the profession in each country, and the resulting availability of radiotherapy.

Section 6

Table 1. Veterinarians' recommendation for radiotherapy in a dog and cat with cancer by country (count (percentage)).

Case I: Dog with soft tissue sarcoma					
	All (n=319)	Austria (n=54)	Denmark (n=90)	UK (n=175)	Chi²-test
I would recommend radiotherapy (and refer the patient)	128 (40.1)	21 (38.9)	26 (28.9)	81 (46.3)	$\chi^2(2)=7.528, P=0.069^a$
I would recommend against radiotherapy	35 (11.0)	7 (13.0)	17 (18.9)	11 (6.3)	$\chi^2(2)=9.929, P=0.021^a$ AT vs DK: $\chi^2(1)=0.835, P=0.356$ AT vs UK: $\chi^2(1)=2.540, P=0.111$ DK vs UK: $\chi^2(1)=9.990, P=0.006^a$
I would not make any recommendation regarding radiotherapy	87 (27.3)	18 (33.3)	29 (32.2)	40 (22.9)	$\chi^2(2)=3.832, P=0.147$
Other	69 (21.6)	8 (14.8)	18 (20.0)	43 (22.9)	$\chi^2(2)=2.514, P=0.285$
Case II: Cat with injection-site sarcoma					
	All (n=317)	Austria (n=47)	Denmark (n=81)	UK (n=189)	Chi²-test
I would recommend radiotherapy (and refer the patient)	128 (40.4)	18 (38.3)	18 (22.2)	92 (48.7)	$\chi^2(2)=16.583, P<0.001^a$ AT vs DK: $\chi^2(1)=3.802, P=0.051$ AT vs UK: $\chi^2(1)=1.629, P=0.202$ DK vs UK: $\chi^2(1)=16.437, P<0.001$
I would recommend against radiotherapy	27 (8.5)	5 (10.6)	15 (18.5)	7 (3.7)	$\chi^2(2)=16.290, P<0.001^a$ AT vs DK: $\chi^2(1)=1.401, P=0.237$ AT vs UK: $\chi^2(1)=3.750, P=0.053$ DK vs UK: $\chi^2(1)=16.628, P<0.001^a$
I would not make any recommendation regarding radiotherapy	80 (25.9)	14 (29.8)	28 (34.6)	40 (21.2)	$\chi^2(2)=5.754, P=0.056$
Other	80 (25.2)	10 (9.9)	20 (24.7)	50 (26.5)	$\chi^2(2)=0.0552, P=0.795$

^aBonferroni correction was applied for multiple comparison and significant results.

Radiotherapy is one of the most advanced treatment options in the field of oncology and requires both specialized training, and access to a radiotherapy treatment unit. The UK has six university veterinary hospitals and a number of veterinary specialists (EBVS, 2022), providing radiotherapy. In contrast, there are less radiotherapy facilities in Denmark, therefore Danish veterinarians would have less experience of radiotherapy as a treatment option and may have to refer cases to treatment facilities outside Denmark.

In addition, we found that veterinarians who have post-graduate qualifications were more likely to recommend radiotherapy compared to colleagues who did not. However we did not investigate the nature of the post-graduate qualifications, in contrast to Denneberg and Engevall (2009), who found that increased training specifically in oncology did influence veterinarians' decision making and advice regarding radiotherapy. It seems reasonable to hypothesise that in general, additional post-graduate

education may lead to a greater openness considering such treatments and hence, increase the number of recommendations.

In addition, we hypothesized that when veterinarians are strongly motivated to contribute to the advancement of veterinary medicine, and provide the current and most effective treatment options, this would have an effect on their advice. Our study confirmed this hypothesis, as veterinarians with a higher development-oriented DEO significantly more often recommended radiotherapy. As already indicated above, radiotherapy is considered one of the most advanced treatment options in the field of oncology. Consequently, veterinarians' general interest in the advancement of small animal medicine and the use of innovative methods (Springer *et al.*, 2021) may impact their recommendation for radiotherapy.

Importantly, the current study aimed to identify whether veterinarians' recommendations for radiotherapy were influenced by the species of the patient. It could have been assumed that factors such as species-related characteristics, or the different management of dogs and cats during as well as after radiotherapy could have an impact. However we found that veterinarians' recommendations did not differ depending upon whether the cancer patient was a dog or cat. This contrasts with studies of animal owners, where findings suggest that owners of dogs were more likely to have their animals undergo radiotherapy compared to owners of cats. This could have a number of explanations: some cat owners may feel that such therapy would be too challenging or stressful due to the animal's nature (e.g. cat who lives only outside), owners may feel less emotionally attached to their cats (Martens *et al.*, 2016), or be less willing to invest too much time or money on cats, particularly as cats are less likely to be insured than dogs (Springer *et al.* 2022).

Conclusions

Based on our findings we conclude that post-graduate education along with veterinarians' strong motivation to advance small animal medicine increase the likelihood that they will recommend radiotherapy. Yet even though radiotherapy may increase patients' quality of life and/or lifespan in both scenarios, approximately one quarter of veterinarians would not make any recommendation. This raises a potential ethical question about the different access to clinical care for cancer patients based on veterinarians' education and motivation, which should be further explored.

References

- Brønden, L.B., Flagstad, A., Rutteman, G.R., Teske, E. (2003). Study of dog and cat owners' perceptions of medical treatment for cancer. *Vet Rec* 152, 77. <https://doi.org/10.1136/vr.152.3.77>
- Chun, R., Garrett, L.D. (2007). Communicating with Oncology Clients. *Vet Clin North Am Small Animal Pract* 37, 1013-1022. <https://doi.org/10.1016/j.cvsm.2007.08.001>
- Christiansen, S.B. (2016). 'What would you do?' Should vets be involved in making the decisions for seriously ill pets? Available at: <https://blogs.biomedcentral.com/on-biology/2016/05/25/vets-involved-making-decisions-seriously-ill-pets/>.
- Denneberg, N.Å., Egenvall, A. (2009). Evaluation of dog owners' perceptions concerning radiation therapy. *Acta Vet Scand* 51, 19-19. <https://doi.org/10.1186/1751-0147-51-19>
- EBVS (2022). Specialists of the European Board of Veterinary Specialisation. Available at: <https://ebvs.eu/specialists>.
- Fan, V.C., Mayer, M.N., Sukut, S.L., Gustafson, N.R., Mauldin, G.N., Waldner, C.L. (2018). Retrospective survey of owners' experiences with palliative radiation therapy for pets. *J Am Vet Med Assoc* 253, 307-314. <https://doi.org/10.2460/javma.253.3.307>
- Hamilton, A., Hortobagyi, G. (2005). Chemotherapy: What Progress in the Last 5 Years? *J Clin Oncol* 23, 1760-1775. <https://doi.org/10.1200/jco.2005.10.034>

Section 6

- LaRue, S.M., Custis, J.T. (2014). Advances in Veterinary Radiation Therapy Targeting Tumors and Improving Patient Comfort. *Vet Clin North Am Small Animal Pract* 44, 909-923. <https://doi.org/10.1016/j.cvsm.2014.05.010>
- Martens, P., Enders-Slegers, M., Walker, J.K. (2016). The Emotional Lives of Companion Animals. Attachment and Subjectivity Claims by Owners of Cats and Dogs, *Anthrozoös* 29:1, 73-88.
- McEntee, M.C., 2014. Veterinary Radiation Therapy: Review and Current State of the Art. *J Am Anim Hosp Assoc* 42, 94-109. <https://doi.org/10.5326/0420094>
- Moore, A.S. (2011). Managing Cats with Cancer. *J Feline Med Surg* 13, 661-671. <https://doi.org/10.1016/j.jfms.2011.07.019>
- Smith, P.A.D., Burnside, S., Helm, J.R., Morris, J.S. (2019). Owner perceptions of radiotherapy treatment for veterinary patients with cancer. *Vet Comp Oncol* 17, 221-233. <https://doi.org/10.1111/vco.12454>
- Springer, S., Sandøe, P., Grimm, H., Corr, S.A., Kristensen, A.T., Lund, T.B. (2021). Managing conflicting ethical concerns in modern small animal practice – A comparative study of veterinarian's decision ethics in Austria, Denmark and the UK. *Plos One* 16, e0253420. <https://doi.org/10.1371/journal.pone.0253420>
- Springer, S., Lund, T.B., Grimm, H., Kristensen, A.T., Corr, S.A., Sandøe, P. (2022). Comparing veterinarians' attitudes to and the potential influence of pet health insurance in Austria, Denmark and the UK. *Vet Rec* e1266. <https://doi.org/10.1002/vetr.1266>

Section 7.

Eating: diet, meat, health and waste

56. Understanding the impact of COVID-19 on healthy and sustainable diets and wellbeing in UK parents

G. Bridge¹, J. Vogt², B. Armstrong³, X. Schmidt Rivera⁴, A. Sandhu² and S. Stetkiewicz^{5*}

¹Independent Researcher, Leeds, LS1 3HE, United Kingdom; ²University of Reading, School of Psychology and CLS, Whiteknights, Earley Gate, Reading, RG6 6AL, United Kingdom; ³University of Sheffield, Department of Geography, Winter Street, Sheffield, S3 7ND, United Kingdom; ⁴Brunel University London, Chemical Engineering Department, Equitable Development and Resilience Research Group, London, UB8 3PH, United Kingdom; ⁵University of Nottingham, Agricultural & Environmental Sciences, South Laboratory, Sutton Bonington Campus, Loughborough, LE12 5RD, United Kingdom; stacia.stetkiewicz@nottingham.ac.uk

Abstract

The COVID-19 pandemic has had a profound influence on people's lives worldwide and created an opportunity for insights into where and how resilience needs to be improved for a variety of systems. This study assessed the impact of COVID-19 on the diets, physical activity levels, and wellbeing of a sample of UK parents. Parents are likely to be particularly impacted by the pandemic due to the changes in childcare and schooling during the pandemic. Key data regarding food consumption, physical activity, and wellbeing were gathered through an online survey conducted during the COVID-19 pandemic in March 2021. Changes in the health and sustainability of individuals' diets at this point in comparison to their pre-COVID-19 norms (based on dietary recall) were assessed, along with changes in physical activity and wellbeing scores. Among survey participants, dietary changes were split, with some participants increasing consumption of healthy and sustainable foods (such as vegetables) while others increased consumption of unhealthy and unsustainable foods (such as processed red meat). Emotional eating was identified as a maladaptive way of coping with COVID-19 related stress that resulted in an unhealthier diet.

Keywords: COVID-19, sustainable diets, emotional resilience, survey

Introduction

The COVID-19 pandemic was a stressor for the resilience of individuals and the food systems. Food choices and dietary intake were altered for many people throughout the COVID-19 pandemic. Research indicates that there was an increase in the consumption of snack foods, carbohydrates, and fruit and vegetables, whilst there was a decrease in the consumption of alcohol and fish (Bennett *et al.*, 2021; Zupo *et al.*, 2020). However, these changes have not been consistently reported. For example, several studies have found decreases in the consumption of fruit and vegetables and increases in the consumption of snacks and alcohol (Bin Zarah *et al.*, 2020; Zhang *et al.*, 2020). Further to changes in dietary intake, changes in cooking and shopping practices have also been reported throughout the pandemic. Reasons posited for the changes in dietary intake and cooking practices included having more time at home, increased stress and the closure of restaurants. Increased food insecurity was also highlighted as being a reason for the changes seen, with many more families using food banks during the pandemic (Bramley *et al.*, 2021).

Whilst widespread, changes in dietary intake and cooking practices were not experienced by all. Research found that adults aged under 50 years were more likely to report substantial changes to their eating patterns than older groups or young adults (Gerritsen *et al.*, 2021). Some adults also experienced greater pressures. For instance, in addition to the pressures of the global pandemic and working from home,

Section 7

parents experienced changes in childcare, the sudden closure of schools, and homeschooling (Bhamani *et al.*, 2020). Other changes in wellbeing that have been found amongst some but not all individuals include those related to mental health. Following the implementation of lockdowns, research found that mental health deterioration increased significantly (Muehlschlegel *et al.*, 2021), whilst other research found that lockdowns were associated with an increase in stress and depression (Mattioli *et al.*, 2020). Changes to mental health status have also been reported to have been associated with some of the aforementioned changes in dietary intake, cooking practices and physical activity. For instance, research has found that emotional eating increased during the pandemic (Mcataamney *et al.*, 2020), and was reported most amongst people with higher depression and anxiety levels (Cecchetto *et al.*, 2021).

Resilience, the capacity to recover quickly from difficulties, may have helped some people to cope better with the stresses of the COVID-19 pandemic. Vertsberger *et al.* (2022) studied the connection between resilience factors and the risk of parental burnout during the pandemic, while Prime, Wade and Browne (2020) looked at risk and resilience factors concerning family well-being. In this study, we assessed the impact of COVID-19 on a range of factors, including food choices and wellbeing indicators to understand the effect of the pandemic on UK parents. We aim to describe these changes and identify factors which may be linked to resilience within the studied population both for future crisis management and for those currently living with stress.

Survey instrument

This study explored how COVID-19 impacted on the diets, physical activity levels, and wellbeing of a sample of UK parents. Parents were chosen as the population subset of interest due to the potentially great impact of changes in childcare and schooling during the pandemic and resulting stress and upheaval.

An online survey was conducted to examine the participants' food behaviour before and during the COVID-19 pandemic, as well as to gather information regarding a range of wellbeing indicators. Participants ($n=246$) with children and based in the UK were recruited via Prolific, an online survey recruitment platform. Recruitment was stratified by gender (male, female) and socio-economic status (high, medium, low). Data were collected between the 19th and 25th March 2021. The survey took approximately 15 minutes to complete and participants received £1.88 for taking part. All participants had at least one child under the age of 18, with most having either 1 or 2 children ($n=1.43\pm 0.96$) living in their household. The data of 25 participants was removed from the data set as less than 50% of the survey was completed. Data were analysed using IBM SPSS Statistics 25.

Results

Impact of COVID-19 on diets

Respondents reported a variety of changes in consumption of the key foods assessed in this survey. On average, consumption of: fruits increased slightly (from 2.25 to 2.4 portions), vegetables increased slightly (from 2.66 to 3 portions), fish increased slightly (from 1.4 to 1.8), whole red meat declined slightly (from 1.88 to 1.79 portions), processed red meat declined slightly (from 1.89 to 1.67 portions), and crisps increased slightly (from 1.76 to 1.8 portions) (Figure 1). Overall, this suggests a shift towards healthier and sustainable diets given the increase in consumption of healthy foods (fruits and vegetables in particular) and decrease in consumption of unhealthy foods (whole and processed red meat). The decreases in both types of red meat are particularly interesting from a sustainability perspective, as red meat is both unhealthy – being linked with several noncommunicable diseases including heart disease and several cancers (Richi *et al.*, 2015) – and has the highest environmental impact of any food category (Poore and Nemecek, 2018).

However, these average changes mask fluctuations in individual diets (Figure 2). For example, while 48% of respondents increased their vegetable consumption, 25% decreased and 27% made no change in this area of their diets. For whole red meat, 20% of respondents increased their consumption, while 35% decreased and 45% remained the same. Variation can be seen in each food category, with some respondents moving towards healthier and more sustainable consumption patterns, such as increased fruit and vegetable consumption, while others move towards less healthy and less sustainable patterns. To understand these patterns, changes in food and drink consumption at individuals' level were assessed by analysing how participants perceived their diets change towards healthier diets during the pandemic (Figure 3). After cleaning the data to remove non-responses ($n=116$), over half of the respondents (54%), agreed that their diets became healthier, while 36% reported the opposite. The 9% remaining reported that their diet did not change (Figure 3).

Impact of COVID-19 on wellbeing

To understand the impact of stress on participants' diet, we averaged all items measuring self-reported stress concerning COVID-19 in the past 14 days, this was justified by Cronbach's $\alpha=0.858$. These items measured how overburdened participants felt by worries and stress about their health, job security, finances, childcare or conflicts at home. This compound stress score was positively associated with the compound score of the items describing emotional eating, $r=0.346$, $P<0.001$, that comprises, for instance, eating to cope with stress (all compound scores were justified by appropriate Cronbach alphas). Further, stress was also associated with a self-reported more unhealthy diet since the start of the pandemic in March 2020, $r=0.184$, $P<0.03$. This means, when stress due to COVID-19 was high then people ate to cope with emotions, their diet became unhealthy in their perception, more difficult to pursue, and food was less secure for them. Conversely, this was less the case when stress caused by COVID-19 was low.

Our data suggest that emotional eating served as maladaptive coping mechanisms as it was negatively associated with indicators of adaptive emotional functioning, $r=-0.142$, $P<0.02$, and the self-reported unhealthiness of the diet, $r=0.206$, $P<0.001$. Related to that, adaptive emotional functioning seemed to serve as a protective factor as it was associated with a score describing adaptive positive coping (e.g. having a structure to the day or social contacts), $r=0.374$, $P<0.001$, and a self-reported healthier diet, $r=-0.284$, $P<0.001$.

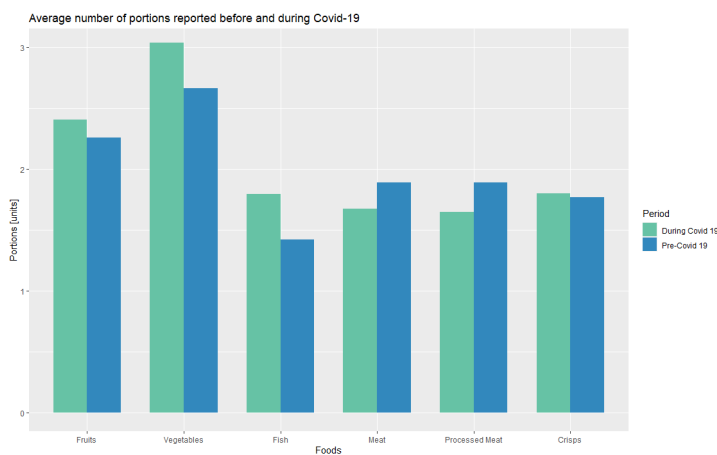


Figure 1. Average number of portions reported before and during COVID-19.

Section 7

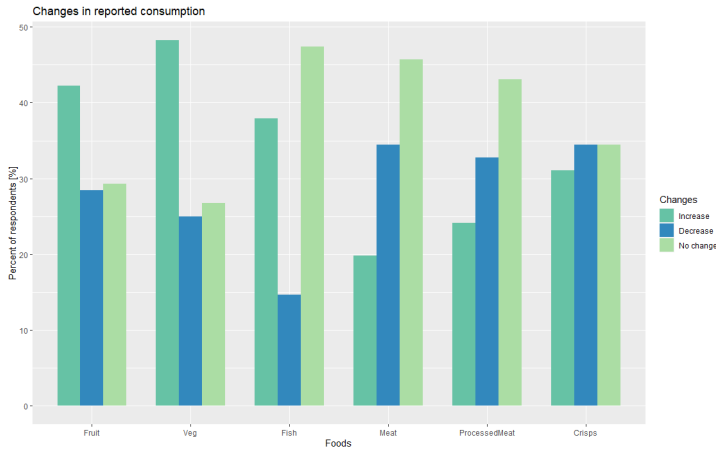


Figure 2. Changes in reported food consumption before and during COVID-19.

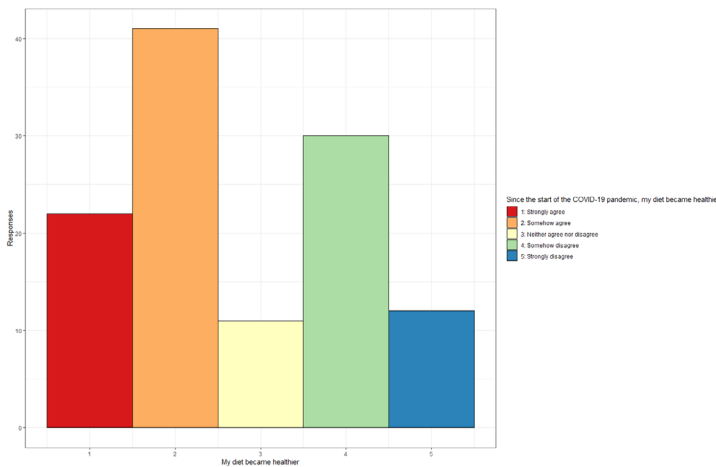


Figure 3. Responses to question 'Since the start of the COVID-19 pandemic, my diet became healthier'.

Conclusions

This study demonstrates that the COVID-19 pandemic had a contrasting impact on the diet and well-being of parents. We observe that some participants exhibited emotional eating as a maladaptive coping mechanism, which was associated with a less healthy diet. Conversely, parents who reported adaptive emotional functioning were more likely to report a shift toward a healthier diet following the outbreak of the COVID-19 pandemic. By identifying the association between emotional resilience and dietary intake, we offer insight into the existing research that presents an inconsistent view of the impact that COVID-19 has had on dietary intake (Bin Zarah *et al.*, 2020; Zhang *et al.*, 2020; Zupo *et al.*, 2020). We demonstrate that the contrasting impact of the COVID-19 pandemic on dietary intake and association between maladaptive coping strategies and move towards a less healthy diet is present in the UK population. Further, we suggest that as emotional eating has been observed as a coping strategy

in both western and non-western societies (Sze *et al.*, 2020) the COVID-19 pandemic may have had a global impact on the dietary intake and wellbeing of parents.

We acknowledge that the current study has several limitations. Due to the unpredictable outbreak of the pandemic, we relied on recall to establish pre-pandemic dietary intake. However, as data were collected in March 2021, shortly after the outbreak of the pandemic, and delayed dietary intake recall may be as accurate as 24-hour recall (Ambrosini *et al.*, 2003), we do not expect that the data were greatly impacted. Participants were recruited via Prolific academic, though recruitment was stratified by gender and socio-economic status; we acknowledge that Prolific academic attracts a limited demographic group. Finally, due to the cross-sectional nature of the study, it is not possible to conclusively ascertain the direction of the relationship between variables explored in the study.

We suggest that future research should explore the underlying factors that contribute to resilience. The majority of existing research explores the impact of COVID-19 using online survey methods, however, we suggest that the use of focus groups would allow an in-depth exploration into the factors which contribute to individuals adopting certain behaviours. In addition, this approach would allow identification of factors that were not included in the survey and offer insight into the impact and potential adaptation to a prolonged pandemic. By identifying the underlying factors which contribute to both positive and negative shifts in well being and dietary intake, we can begin to develop interventions that could provide support in future pandemics or global shocks.

The current research provides policy makers with an insight into the impact of pandemic situations on dietary intake and wellbeing of parents. We propose that policy makers should consider providing resources to support emotional resilience in parents to lead to healthier and more sustainable food choice outcomes in preparation for future health crises. Given the likelihood of future pandemics and global shocks, we suggest that the secondary impacts on diet and wellbeing should not be overlooked as they are likely to have a significant impact on the long-term health of the general population.

References

- Ambrosini, G. L., Van Roosbroeck, S. A., Mackerras, D., Fritschi, L., De Klerk, N. H. and Musk, A. W. (2003). The reliability of ten-year dietary recall: implications for cancer research. *The Journal of nutrition*, 133(8), 2663-2668.
- Bhamani, S., Makhdoom, A. Z., Bharuchi, V., Ali, N., Kaleem, S. and Ahmed, D. (2020). Home learning in times of COVID: Experiences of parents. *Journal of Education and Educational Development*, 7(1), 9-26.
- Bennett, G., Young, E., Butler, I. and Coe, S. (2021). The Impact of Lockdown During the COVID-19 Outbreak on Dietary Habits in Various Population Groups: A Scoping Review. *Frontiers in Nutrition*, 8(March), 1-10. <https://doi.org/10.3389/fnut.2021.626432>
- Bin Zarah, A., Enriquez-Marulanda, J. and Andrade, J. M. (2020). Relationship between dietary habits, food attitudes and food security status among adults living within the united states three months post-mandated quarantine: A cross-sectional study. *Nutrients*, 12(11), 1-14. <https://doi.org/10.3390/nu12113468>
- Bramley, G., Treanor, M., Sosenko, F. and Littlewood, M. (2021). Building the evidence on poverty, destitution, and food insecurity in the UK (Issue May).
- Cecchetto, C., Aiello, M., Gentili, C., Ionta, S. and Osimo, S. A. (2021). Increased emotional eating during COVID-19 associated with lockdown, psychological and social distress. *Appetite*, 160(January), 105122. <https://doi.org/10.1016/j.appet.2021.105122>
- Gerritsen, S., Egli, V., Roy, R., Haszard, J., De Backer, C., Teunissen, L., Cuykx, I., Decorte, P., Pabian Pabian, S., Van Royen, K., Te Morenga Ngapuhi, L., Whātua, N., Uri Hua, T., Rarawa, T. and Te Morenga, L. (2021). Seven weeks of home-cooked meals: changes to New Zealanders' grocery shopping, cooking and eating during the COVID-19 lockdown. <https://doi.org/10.1080/03036758.2020.1841010>

Section 7

- Mattioli, A. V., Sciomer, S., Cocchi, C., Maffei, S. and Gallina, S. (2020). Quarantine during COVID-19 outbreak: Changes in diet and physical activity increase the risk of cardiovascular disease. *Nutrition, Metabolism and Cardiovascular Diseases*, 30(9), 1409-1417. <https://doi.org/10.1016/j.numecd.2020.05.020>
- Mcatamney, K., Mantzios, M., Egan, H. and Wallis, D. J. (2020). Emotional eating during COVID-19 in the United Kingdom: Exploring the roles of alexithymia and emotion dysregulation. *Appetite*, 161 (January).
- Muehlschlegel, P. A., Parkinson, E. A. J., Chan, R. Y. L., Arden, M. A. and Armitage, C. J. (2021). Learning from previous lockdown measures and minimising harmful biopsychosocial consequences as they end: A systematic review. *Journal of Global Health*, 11, 1-15. <https://doi.org/10.7189/jogh.11.05008>
- Poore, J. and Nemecek, T. (2018). Reducing food's environmental impacts through producers and consumers. *Science*, 360(6392), 987-992. <https://doi.org/10.1126/science.aag0216>
- Prime, H. and Wade, M. (2020). Risk and resilience in family well-being during the COVID-19 pandemic. *American Psychologist*, 75(5), 28-29.
- Richi, E. B., Baumer, B., Conrad, B., Darioli, R., Schmid, A. and Keller, U. (2015). Health risks associated with meat consumption: A review of epidemiological studies. *International Journal for Vitamin and Nutrition Research*, 85(1-2), 70-78. <https://doi.org/10.1024/0300-9831/a000224>
- Sze, K.Y.P., Lee, E.K.P., Chan, R.H.W. *et al.* Prevalence of negative emotional eating and its associated psychosocial factors among urban Chinese undergraduates in Hong Kong: a cross-sectional study. *BMC Public Health* 21, 583 (2021). <https://doi.org/10.1186/s12889-021-10531-3>
- Vertsberger, D., Roskam, I., Talmon, A., van Bakel, H., Hall, R., Mikolajczak, M. and Gross, J.J. (2022). Emotion regulation during the COVID-19 pandemic: risk and resilience factors for parental burnout (IIPB). *Cognition and Emotion*, 36(1), 100-105. <https://doi.org/10.1080/02699931.2021.2005544>
- Zhang, J., Zhao, A., Ke, Y., Huo, S., Ma, Y., Zhang, Y., Ren, Z., Li, Z. and Liu, K. (2020). Dietary behaviors in the post-lockdown period and its effects on dietary diversity: The second stage of a nutrition survey in a longitudinal chinese study in the covid-19 era. *Nutrients*, 12(11), 1-12. <https://doi.org/10.3390/nu12113269>
- Zupo, R., Castellana, F., Sardone, R., Sila, A., Giagulli, V. A., Triggiani, V., Cincione, R. I., Giannelli, G. and De Pergola, G. (2020). Preliminary trajectories in dietary behaviors during the COVID-19 pandemic: A public health call to action to face obesity. *International Journal of Environmental Research and Public Health*, 17(19), 1-15. <https://doi.org/10.3390/ijerph17197073>

57. Reduced beef consumption among different organic consumer groups – drivers and substitution patterns

S. Denver*, J. Nordström and T. Christensen

Department of Food and Resource Economics, University of Copenhagen, Rolighedsvej 23, 1958 Frederiksberg C, Denmark, sd@ifro.ku.dk

Abstract

In the present study, we investigated consumer behaviour in connection with a transition to a more climate friendly diet. In particular, we focussed on consumers' interest in reducing beef consumption, identified important drivers of reduced beef consumption and examined which types of food that are likely to replace beef. Moreover, we identified to what extent *Loyal* organic consumers, who belong to the fifth of the responders with the highest organic consumption, differ from *Other* consumers. The study is based on analysis of data from an online survey in 2021 among 1000 Danish consumers. The results show that the vast majority of the respondents in the survey were aware that their actions affect the climate, but they did not necessarily associate their carbon footprint with food consumption. Overall, almost half of the surveyed consumers wanted to reduce their consumption of beef, mainly consumers belonging to the *Loyal* organic segment. The reductions in beef consumption across both consumer groups were driven by concerns about the climate, own health and animal welfare. The favourite replacement for beef was chicken followed by vegetables and fish. The results also show that at least half of the respondents did not intend to reduce their beef consumption. Hence, if a significant reduction in beef consumption is a societal goal, then we need to implement initiatives that are targeted towards increasing consumer awareness of the climate impact of their food choices and that make it easier – and cheaper – to choose a more climate friendly diet.

Keywords: climate friendly food, replacement for beef, quantitative data

Background

The food sector is a major contributor to emission of greenhouse gasses, and especially meat and dairy production are associated with high emissions (Godfray *et al.*, 2018; Poore and Nemecek, 2018). Growing concern about climate change has led to an increased focus on our habits regarding food consumption, in particular the consumption of red meat. The EAT Lancet Commission has suggested that a healthy sustainable diet consists of not more than 14 grams of red meat per day which requires that on a global scale, the beef consumption is reduced by more than half (Willet *et al.*, 2019).

Many studies have found that having a high organic consumption is accompanied by eating little meat and many vegetables (e.g. Baudry *et al.*, 2019). Less research has investigated potential differences in the drivers of reduced beef consumption among different organic consumer groups. And even less research has tried to understand the substitution patterns related to reduced beef consumption. In this study, we address this research gap.

Material and methods

The study is based on a quantitative online survey answered by 1000 representatively selected Danish respondents in 2021. The survey included a range of questions regarding consumption of beef and willingness to reduce the consumption of beef.

Section 7

All respondents were asked about their awareness of the climate impact of their actions. Respondents who were trying to, or had intentions to, reduce their consumption of beef were additionally asked about (1) their motives for reducing their beef consumption; and (2) which kinds of food they would eat instead of beef. To identify the respondents' motives to reduce beef consumption, we asked them to choose from a list of eight potential reasons (shown in Figure 1). The respondents' choice of replacement products was revealed by asking the respondents if they would increase their consumption of pork, poultry, vegetables or fish when they lowered their beef consumption (shown in Figure 2). In the questions regarding motives, replacement products, and awareness, the respondents could choose more than one option.

Moreover, in order to group the respondents according to their organic consumption, we asked the respondents to indicate how often they had chosen the organic version of meat, vegetables, and milk when considering their purchases over the past six months. The response categories ranged from '0 times out of 10' to '10 times out of 10'. The organic purchase frequencies of all three products were aggregated into one average frequency. If a respondent did not consume one or two of the products, the overall frequency was based on the other product(s) (e.g. if a respondent did not consume meat, then the categorization was based on the frequency of purchasing organic vegetables and milk). In total, 60 respondents who reported that they never consumed vegetables, meat, and milk were removed from the analysis, as it was not possible to group them meaningfully. The remaining 940 respondents were divided into two consumer groups where the group consisting of the 22% of the respondents with the highest organic purchase frequency was categorized as *Loyal* organic consumers while the remaining were categorized as *Other* consumers. Differences in stated perceptions and behaviour between the two groups were reported a significant, if the difference was significant at least at 0.05 significance level.

Results

The vast majority of the respondents in the survey were aware that their actions affect the climate. Despite this high level of awareness about own climate impact, only one in four respondents stated that they try to buy foods with a lower climate footprint. Mainly the *Loyal* organic consumers were found to think about the climate when choosing foods.

Looking specifically at beef consumption, we found that about half of the respondents claimed that they try, or have intention, to eat less beef. In particular, more than two-thirds of the *Loyal* organic consumers would reduce their beef consumption whereas only 44% of the *Other* consumers would do so.

Figure 1 shows the potential motives for reducing the consumption of beef. Across both consumers groups, concerns for a negative climate impact was the most commonly mentioned driver for reducing beef consumption followed by health concerns and concerns for animal welfare. While the two groups mentioned these three potential motives to the same extent, significantly more *Loyal* organic consumers than *Other* consumers stated that concerns for wild animals and plants was a reason to reduce beef consumption.

Figure 2 shows which other foods the respondents would choose to replace beef. Across both consumer groups, many respondents stated that they would consume more chicken or vegetarian food instead of beef. Only around one out of five respondents would consume more pork as replacement for beef. Interestingly, respondents with a high organic consumption were more willing than other respondents to replace beef with vegetables or fish.

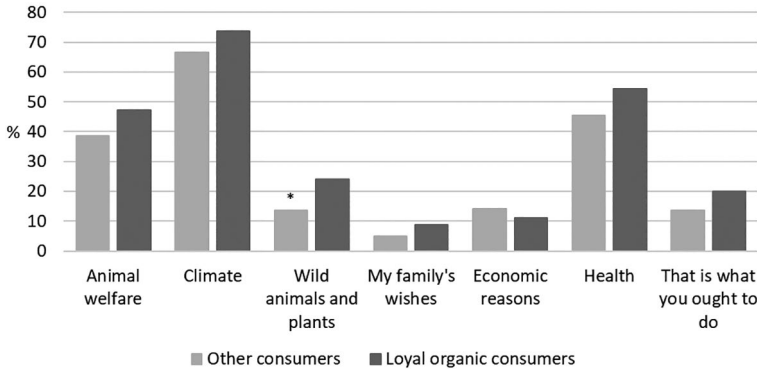


Figure 1. Motives to reduce beef consumption among Other consumers and Loyal organic consumers. Based on 442 respondents who stated that they would like to reduce their consumption of beef. Less than 2% of these respondents chose the option 'in consideration for what my friends do' or 'don't know' (not shown in the figure). A star * indicates that the difference between Other consumers and Loyal organic consumers is significant at least at 0.05 level.

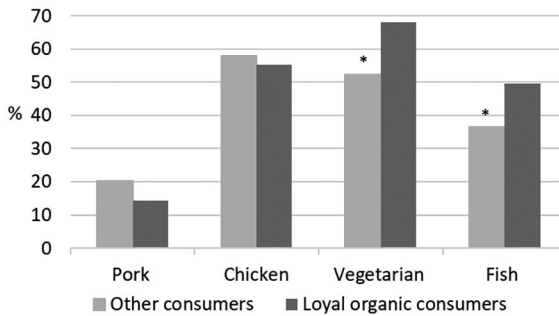


Figure 2. Share of Other consumers and Loyal organic consumers who will replace beef with pork, chicken, vegetarian food or fish, respectively. Based on 442 respondents. * indicates that the difference between Other consumers and Loyal organic consumers is significant at least at 0.05 level.

Discussion

The results emphasize that the climate is on the agenda for many consumers, but they also highlight that stronger incentives are needed if the aim is to encourage a larger portion of the population to eat more climate-friendly.

Incentives can be in the form of more readily available knowledge about the climate effect of food consumption and could involve a carbon label. Edenbrandt and Lagerkvist (2021) found that a traffic light carbon label increases demand for more climate friendly food products, in particular among consumers who purchase little meat and many sustainable products. Results in Edenbrandt *et al.* (2021) support this finding, and also show that consumers who are not interested in the foods' carbon footprint will be affected by the information and make more carbon friendly choices. In line with the findings in our study, Edenbrandt *et al.* (2021) find that most consumers will replace beef with chicken, followed by pork and plant-based meat substitutes.

Section 7

In order to estimate the net benefits of reduced beef consumption on the climate, it is vital to have information about which products the consumers choose to replace beef. Our results suggest that especially chicken and vegetarian dishes and to some extent, fish can be expected to replace beef whereas few consumers intend to substitute beef with pork. As the carbon emissions both per kg chicken and per kg pork are found to be substantially lower than those from beef, the lack of willingness to substitute beef with pork may be due to a lack of knowledge about climate impact of pork production. This would be in line with a study by Shi *et al.* (2018), where respondents perceived pork to be significantly less climate friendly than chicken. The reluctance to replace beef with pork could also be driven by other factors such as taste or perceptions that other substitutes are healthier alternatives than pork. However, if the low interest in pork is due lack of knowledge then a carbon label may be an effective tool to apply.

Incentives could also be of monetary nature and involve taxes or subsidies. Gren *et al.* (2021) found that a carbon tax of 115 euros per ton carbon dioxide equivalent in Sweden would reduce total emissions from food consumption by only around 4% – but suggested that the tax revenue could be used to subsidize farmers for climate friendly initiatives and thereby increase climate benefits from the tax.

Conclusions

The results show that the vast majority of the respondents in the survey were aware that their actions affect the climate, but they did not necessarily associate their carbon footprint with food consumption. A willingness to reduce beef consumption was mainly found among *Loyal* organic consumers who were also more likely than *Other* consumers to be driven by a desire to preserve wild animals and plants. The favourite replacement for beef was chicken followed by vegetables and fish. At the same time, at least half of the respondents did not intend to reduce their beef consumption. Hence, initiatives that are targeted towards increasing consumer awareness of the climate impact of their food choices and that make it easier and cheaper to choose a more climate friendly diet are needed if a significant reduction in beef consumption is a societal goal.

References

- Baudry *et al.* (2019). Improvement of diet sustainability with increased level of organic food in the diet: findings from the BioNutriNet cohort, *American Journal of Clinical Nutrition*, 109, 1173-1188.
- Edenbrandt, A.K. and Lagerkvist, C.-J. (2021). Is food labelling effective in reducing climate impact by encouraging the substitution of protein sources? *Food Policy*, 101, 102097
- Edenbrandt, A., Lagerkvist, C.-L. and Nordström, J. (2021). Interested, indifferent or active information avoider of carbon labels: cognitive dissonance and ascription of responsibility as motivating factors, *Food Policy*, 101, 102036.
- Gren, I.M., Höglind and Jansson, T. (2021). Refunding of a climate tax on food consumption in Sweden. *Food Policy*, 100, 102021
- Godfray, H.C.J., Aveyard, P., Garnett, T., Hall, J.W., Key, T.J., Lorimer, J., ... Jebb, S.A. (2018). Meat consumption, health, and the environment. *Science (New York, N.Y.)*, 361(6399).
- Poore, J. and Nemecek, T. (2018). Reducing food's environmental impacts through producers and consumers. *Science*, 360, 987-992.
- Shi, J. Visschers, V.H.M., Bumann, N. and Siegrist, M. (2018). Consumers' climate-impact estimations of different food products. *Journal of Cleaner Production*, 172, 1646-1653.
- Willett *et al.* (2019). Summary report of the EAT Lancet Commission (Food in the Anthropocene: the EAT–Lancet Commission on healthy diets from sustainable food systems). The Lancet Commissions.

58. Food waste: does agreement conceal ambiguity?

M. Gjerris* and C. Gamborg

Department of Food and Resource Economics, University of Copenhagen, Rolighedsvej 23, 1958 Frederiksberg C, Denmark; mgj@ifro.ku.dk

Abstract

In 2011, FAO put the subject of food waste on the public agenda with calls for political action. Perhaps not surprisingly, in a context of almost a billion people living with hunger as a daily condition, and a global food production challenged by e.g. the climate crisis, it is a subject which citizens, NGOs and politicians have been able to unite about all over the world. Food waste is part of the Sustainable Development Goals (Target 12.3) urging to reduce food losses along the production and supply chains. However, the widespread agreement on combatting food waste might be concealing important ambiguities and profound ethical disagreements. Whereas 'waste' per definition seems bad, there is no common understanding of what should be considered 'food waste'. We examine if definitions of food waste should include (some forms of) animal feed and animal products. The environmental impact of animal production and consumption is increasingly coming under public and political scrutiny, not least in the light of reaching the goals of the Paris Agreement from 2015. We consider arguments for and against understanding animal products based on either animal feed – that could have been used for human consumption – or animal products based on feed grown on land that could have been used to grow plants for human consumption as so-called 'avoidable indirect food waste' from a consequentialist and a virtue oriented perspective.

Keywords: animal production, feed, food ethics, sustainability, virtue

Introduction

According to United Nation's World Food Program, 957 million people globally did not have enough to eat in 2021 and of these, an estimated 293 million were in need of humanitarian assistance and protection – many in the shape of food (Laganda, 2021). At the same time food production globally contributes to climate change, biodiversity loss, land use change, eutrophication, lack of fresh water, soil degradation, nitrate water pollution etc. (Willert *et al.*, 2019) – which in turn challenge the provision of enough (healthy) food for the global population. In the light of the human suffering caused by hunger and the many negative environmental impacts of food production on the environment, it is hardly controversial to state that food is a precious resource. Consequently wasting food can easily be condemned. There were therefore few, if any, protests when FAO placed food waste on the public agenda and called for action (FAO, 2011). Food waste later became part of the United Nations Sustainable Development Goals in 2015 as target 12.3: 'By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses' (UN General Assembly, 2015). A multitude of campaigns, initiatives and policies on local, regional, national and international levels have grown out of it (von Braun *et al.*, 2020) and one will be hard pressed to find any NGO, company, researcher, regulatory body or politician who will speak up for food waste. In a world full of division and strife, humanity seems to have found a common enemy.

Different understandings of food waste

The widespread agreement on reducing food waste is at first sight comforting. But the apparent agreement conceals not only the ambiguity of the concept of food waste, but also ethical disagreements about the normative thrust of the notion. In that way the concept is similar to other concepts in the public sphere that can gather support from most of the involved until the discussion leaves the abstract layers of good intentions and turns to the practical details of what actually to do with exactly what. Concepts such as ‘animal welfare’ and ‘sustainability’ comes to mind here. We will here disregard discussions about how food waste initiatives might sometimes be seen as ‘greenwashing’ (Andrews, 2020) and further discussions on whether the huge attention directed towards individual consumer behaviour might function as a distractor from more structural reasons for global hunger (Caraher and Furey, 2017).

International organizations, state governments and secretariats have developed a number of characterizations of food waste. Thus, there is no clear internationally accepted standard definition. Designations of food waste vary, among other things, in what food waste consists of, how it is produced and where or what it is discarded from or generated by. Definitions also differ due to cultural variations because what is considered to be waste in some countries may not be considered waste in others (i.e. intestines and internal organs of some animals), and there is disagreement whether certain types of food waste should be considered food waste if it can be utilized as e.g. bio-fertilizer and bio-energy (Gjerris and Gaiani, 2013). To confuse the picture further there is a growing tendency of dividing food waste into two subcategories: food loss and food waste. FAO uses ‘food loss’ to refer to reductions in edible food mass during production, post-harvest and processing and the term ‘food waste’ to refer to reductions at the retail and consumer levels. Food loss and food waste together are included in the more general term ‘food wastage’ (FAO, 2011). United State Department of Agriculture’s Economic Research Service (ERS), on the other hand, defines food loss as the edible amount of food, post-harvest, that is available for human consumption but which is *not* consumed for some reasons (e.g. cooking loss and natural shrinkage, loss from mould, pests, or inadequate climate control) and food waste as when an edible item goes unconsumed, as in food discarded by retailers due to colour or appearance and plate waste by consumers. In the European Union, there seems to be some lack of clarity towards definitions of food loss and food waste, but the EU project FUSIONS defines food loss and waste together as: ‘any food, and inedible parts of food, removed from the food supply chain to be recovered or disposed (including composted, crops ploughed in/not harvested, anaerobic digestion, bio-energy production, co-generation, incineration, disposal to sewer, landfill or discarded to sea)’ (FUSIONS, 2016).

This plethora of definitions makes it hard to compare numbers across countries and regions. can influence where efforts are made, leading to less efficient policies across borders/institutions. FAO and EU are therefore working on standardization of terms (EU, 2019; FAO, 2022). What seems to be broadly agreed in this wilderness of definitions is that food loss occurs early in the food supply chain (farm level) whereas the waste happens later e.g. in retail, catering, and among consumers (fork level) (e.g. Von Braun *et al.*, 2020). However, this very broad distinction has met criticism for not being able to take into account differences between e.g. different food products and geographical areas (Garcia-Garcia *et al.*, 2015). As mentioned, differences in understanding what food loss/waste is, raise practical obstacles for meaningful quantifications and comparisons which in turn might stand in the way of effective action. But, differences in food waste definitions also raise ethical issues through the normativity instilled in the definition. For example, Smil (2004) suggests that overeating – understood as the difference between the amount of calories that each person consumes and what he/she needs (energetic value) – should be considered food waste. Such a definition opens up a discussion on ‘valid’ and ‘invalid’ reasons for over-eating: Should people who exercise more than ‘necessary’ for personal health reasons – and thus needs more calories than a less physically active person – be considered food wasters? And will such an approach increase weight bias and obesity (self-)stigma in cultures where having a slim waistline is seen

as an expression of being a successful person? Perhaps more radically, in 2012, The Barilla Center for Food and Nutrition, which analyses the complexity of current agro-food systems trying to foster change towards healthier and more sustainable lifestyles in order to achieve the goals set by the United Nations 2030 Agenda for Sustainable Development, suggested to include feed for animals as food waste as the plant proteins converted to animals proteins could have been eaten by humans and ensured a higher available amount of valuable nutrients (Barilla, 2012). In the rest of the paper we will examine some of the key definitional and ethical issues that this suggestion raises.

Animal products as food waste – a tentative definition

The contribution of animal production in relation to the environmental impact on e.g. climate change and biodiversity has been under increasing critical scrutiny – at least since Steinfeld *et al.* published ‘Livestock’s long shadow’ in 2006. A long list of research papers, reviews and reports have since strengthened the claim that animal production is part and parcel of the environmental problems that face the human race (see e.g. Willett *et al.*, 2019). One aspect of this is feed-to-food conversion efficiency which, somewhat simplistically explained, shows the loss when animals eat feed that could have been eaten by humans. What exactly to measure here is a question for debate. Here we broadly follow Shepon *et al.*, (2016) who analyse caloric and protein conversion efficiencies. Their study show that taken across species only 7.5% of the protein in the feed ends up as animal protein for human consumption, with eggs being the most efficient way of converting plant protein into animal protein (31%), and beef, perhaps not surprisingly, the least efficient (3%). Thus, it would seem that eating plants instead of animals would not only make it possible to increase food production, but also lower the environmental impact, notably by reducing GHG emissions and the area used for agriculture. However, as all animal feed is not suitable for human consumptions, and some animals graze in areas where it is not possible to grow food for human, there might in some situations be an increase in nutritional values when the feed goes through the animal.

A tentative definition of animal products as food waste could therefore be: ‘Animal products are *indirect avoidable food waste*, unless they have been produced in such a way as to only utilise resources (land, water, energy etc.) that could not have been used to produce plants that could have fed more humans adequately with a lower environmental impact’ (Gjerris, 2020).¹⁶ Looking at animal products in this way means focusing on a combination of available adequately nutritious food for humans combined with an ambition to produce it with as little environmental impact as possible. This also means that even though it might from a pragmatic angle (where the average consumer does not have time in their daily lives to find information about the individual animal product’s history from farm to fork) should be a rule of thumb to avoid animal products in order to reduce food waste, the definition does not require humans to take up a vegan lifestyle as some animal products will live up to the demands of the definition to not be considered food waste. Further, it is worth noting that the definition does not take into account anything other than nutritional value and environmental impact. And as animal products are seen by

¹⁶ Three reservations are necessary here: (1) We have chosen to talk about *food* waste instead of *resource* waste as we wish to discuss to what extent expanding the understanding of food waste to cover certain kinds of animal feed/animal food products could lead to less waste. (2) As already the terminology confusion around the feed-to-food conversion ratio shows, it is a challenge to come up with a precise definition in the sense that it is unclear whether one should compare calories, proteins, micronutrients, weight etc. So we realize that the suggested definition is too broad to be used in practice as e.g. production methods, local conditions, dietary needs and food habits vary to such a degree that a much more contextual approach will be necessary to adequately be able to label a specific practice/product *indirect avoidable food waste*. However, as the aim here is to consider the overall question and not develop a functional labelling system, we believe this is a justified approach. (3) We have not included possible loss/waste of food when processing plant protein into ‘meat alternatives’ of various kinds due the limitation of space in this paper and the limited research into the area. But obviously, it is an area worth looking into as well.

Section 7

many consumers as a normal part of their diets, and animal products are embedded in cultural traditions and socially practices there might be more at stake (steak!) here than nutrition and environment.

Animal products as food waste – ethical perspectives

A definition of food waste that includes (some) animals products based on an assessment of their ability to feed humans adequately and environmental impact would be aligned with the already established environmental goals of reducing food loss and waste and make possible higher food production as plant based diets typically take up a lot less land than animal based (Richtie, 2021). This links the definition to the Sustainable Developmental Goals, most noteworthy SDG 2 (zero hunger) and SDG 13, 14 & 15 (climate action, life below water and life on land) Food loss and waste is thus tied to several of the SDGs in complex ways and should not be seen as an individual problem without ties to the rest of the environmental and social challenges facing humanity. A reduction in the production and consumption of animal products could thus contribute to reaching the SDGs in several ways. The connection between reduced food loss/waste including avoidable indirect food waste through animal production/consumption and closing the gap between the current reality and the ideals of the SDGs is, however, not automatic. As an example, reductions in food waste at the consumer level are very often heralded as a way for the individual consumer to save money – and there is money to save. Yu and Jaenicke (2020) estimate that food waste in the US alone annually is worth 240 billion USD a year. However, if the only motivation for reducing food waste is to save money and these are then spend on other kinds of consumption, the possible environmental gain could easily be lost – and at the same time nothing would have been done for those who lack food.

This goes to show that even though we find it meaningful from a nutritional and environmental impact perspective to adopt the idea of (some) animal products as *indirect avoidable food waste*, there is more to be said when considering the suggestion from a consequentialist ethical perspective where the overall goal is to increase human welfare (we here deliberately leave out animal welfare aspects not to complicate the discussion more than necessary). Because what would actually happen, if animal food products are suddenly spoken of as ‘food waste’? What happens when the suggested definition understanding of food waste runs into the reality of cultural and social narratives around animal products? Animal products are part and parcel of the diet of many people and in the Western World a very large part and parcel. Understanding certain animal products as food waste based on production methods and nutritional value will probably seem counterintuitive to many people. Pictures of hungry children and wasteful behaviour comes easier to us when we see a dumpster full of wrapped, edible foods compared to looking at the pork chops in the super market counter. Further, discussions around reductions of production/consumption of animal products show that to many people such products are not just nutrition, but part of their self-understanding and any attempts to limit access to such products are met with fierce resistance and a plethora of more or (often) less valid arguments (e.g. Piazza, 2019). Thus, if organizations and authorities adopt the suggested definition it might create a social backlash. A suggestion to animal products as food waste could result in introducing the concept of food waste into the waging ‘war’ between plant- and meat-based diets in the public sphere and alienate consumers partial to animal products from efforts to reduce food waste as it would be seen as part of the ‘vegan agenda’. So the consequences of introducing some animal products into the sphere of food waste might end up making it harder to reach the goals that initially brought the area into the attention of the public. Although perhaps counterintuitive (we doubt that many people in their daily lives regard discarding inedible parts of food, e.g. bones as food waste as suggested by the FUSION definition), there is more at stake than familiarity when considering the expansion of the concept of food waste suggested here. Even though a reduction in both food loss and waste and animal production/consumption would be preferable from a consequentialist perspective that seek to maximize human welfare, there is reason to be cautious with

linking the two as the cultural and social narratives about animal products are so strong that it might undermine current efforts to reduce food loss and waste.

Seen from a more virtue oriented perspective, however, the suggestion of seeing animal products as food loss and waste might carry more weight. If we take it as a premise that the virtue oriented consumer agrees that – in relation to food – the virtue of *sophrosyne* (temperance) is a character trait that should permeate the life of the individual, then including not only reflections on the food eaten from an individual health perspective but also an broader social and environmental perspective (e.g. SDGs 2, 13, 14 and 15) would make sense, as the virtue oriented consumer would be interested in aiming at personal integrity understood as expressing the relevant virtues in all aspects of life. *Sophrosyne* regarding health can be seen as an individually oriented expression of the virtue, whereas including social and environmental concerns can be seen as a community oriented expression of the virtue (we here disregard whether that community is understood in an anthropocentric or ecocentric way). Understanding some animal products as food waste can be seen as a recognition of their avoidable environmental impact and a subsequent reduction in production/consumption an expression of relevant virtues. These include the virtue of justice in the sense that it can help free up areas for production of food for humans in need and the virtue of ‘respect for nature’ as suggested by Hursthouse (2007) as at the same time it allows areas to be ‘returned to nature’. Furthermore the expanded understanding of what should be regarded as food waste helps contextualize food products and see them not only as that leftovers on the plate, but include their history from farm to fork. This aligns with the contextualized decision structure within virtue ethics, where part of *phronesis* (practical wisdom) can be said to be to gather all relevant information with relevance for our daily practices when figuring out how to express the relevant virtues in ‘the right way, towards the right objects, for the right reasons, to the right degree, on the right occasions, in the right manner, and to act accordingly.’ (Hurtshouse, 2007, p. 161).

Conclusions

We find that the broader definition of food loss and waste suggested here is valid and can support the goals already present in attempts to reduce the problems associated with food loss and waste. There are, however, pragmatic reasons when seen from a consequentialist ethical perspective to be cautious about adopting the definition due to the cultural and social narratives embedded in the production and consumption of animal products. Further, it is necessary to take into account a range of contextual factors before labelling a specific product *indirect avoidable food waste*. However, seen as a general ‘rule of thumb’ expanding the definition of food loss and waste to include certain kinds of animal feed/animal products as *indirect avoidable food waste* could well align with a virtue ethical approach to food as not only an individual, but also a social and environmental expression of *sophrosyne*.

References

- Andrews, E. (2021): Why do we continue to believe companies that greenwash. Grist <https://grist.org/ask-umbra-series/why-do-we-continue-to-believe-companies-that-greenwash/>.
- Barilla Center for Food & Nutrition (2012): Food waste: causes, impacts and proposals. Barilla Center for Food & Nutrition.
- Caraher, M. and Furey, S. (2017): Is it appropriate to use surplus food to feed people in hunger? Short-term Band-Aid to more deep rooted problems of poverty. Food Research Collobration).
- EU Commission(2019): Commission delegated decision (EU) 2019/1597 of 3 May 2019 supplementing Directive 2008/98/EC of the European Parliament and of the Council as regards a common methodology and minimum quality requirements for the uniform measurement of levels of food waste. Official Journal of The European Union L248 (62): 77-85.

Section 7

- FAO (2011): Global food losses and food waste – Extent, causes and prevention. Food and Agricultural Organization of the United Nations <https://www.fao.org/3/i2697e/i2697e.pdf> (accessed 09.03.22).
- FAO (2022): Sustainable Development Goals. Sub-Indicator 12.3.1.b – Food Waste Index. Food and Agricultural Organization of the United Nations.
- FUSIONS (2016): Estimates for European Food Waste Level. Fusions.
- Garcia-Garcia, G., Wooley, E. and Rahimifard, S. (2015): A Framework for a More Efficient Approach to Food Waste Management. *International Journal of Food Engineering* 1: 65-72.
- Gjerris, M. and Gaiani, S. (2013): Household food waste in Nordic countries. Estimations and ethical implications. *Nordic Journal of Applied Ethics* 7 (1): 6-23.
- Gjerris, M. (2020): Food waste – some ethical reflections. In: von Braun J, Sorondo MS and Steiner R (eds): *Reduction of food loss and food waste. Scripta Varia* 147. Vatican City: Libreria Editrice Vaticana, pp. 227-33.
- Hursthouse, R. (2007): Environmental virtue ethics, in Walker, R.L. and Ivanhoe, P.J. (eds.) *environmental ethics*. Oxford University Press. s. 155-172.
- Laganda, G. (2021): 2021 is going to be a bad year for world hunger. UN Food Systems Summit 2021. <https://un-food-systems.medium.com/2021-is-going-to-be-a-bad-year-for-world-hunger-6a7c43a294cf> (accessed 09.03.22).
- Piazza, J. (2019): Why People Love Animals Yet Continue to Eat Them, in: Dhont K and Hodson (eds.): *Why We Love and Exploit Animals*. London: Routledge pp. 121-36.
- Richtie, H. (2021): If the world adopted a plant-based diet we would reduce global agricultural land use from 4 to 1 billion hectares. *Our World in Data* <https://ourworldindata.org/land-use-diets> (accessed 09.03.22).
- UN General Assembly (2015): Transforming our world: the 2030 Agenda for Sustainable Development A/RES/70/1. UN General Assembly.
- Shepon, A., Eshel, G., Noor, E. and Milo, R. (2016): Energy and protein feed-to-food conversion efficiencies in the US and potential food security gains from dietary changes. *Environmental Research Letters* 11 (10).
- Smil, V. (2004): Improving Efficiency and Reducing Waste in Our Food System. *Environmental Sciences* 1 (1): 17-26.
- Steinfeld, H., Gerber, P., Wassenaar, T., Castel, V., Rosales, M. and De Haan, C. (2006): *Livestock's Long Shadow – Environmental Issues and Options*. Food and Agricultural Organisation of the United Nations, Rome, Italy.
- von Braun, J., Sorondo, M.S. and Steiner, R. (eds.) (2020): *Reduction of food loss and food waste. Scripta Varia* 147. Vatican City: Libreria Editrice Vaticana.
- Willett, W. *et al.* (2019): Food in the anthropocene: the EAT–Lancet Commission on Healthy Diets from Sustainable Food Systems. *Lancet* 393 (10170): 447-92.
- Yu, Y. and Jaenicke, E.C. (2020): Estimating food waste as household production inefficiency. *American Journal of Agricultural Economics* 102 (2): 525-47.

59. Governance of food insecurity – food waste, depoliticization and shadow state

A. Inza-Bartolomé¹ and L. Escajedo San-Epifanio²

¹*Department of Sociology and Social Work, Faculty of Labour Relations and Social Work, University of the Basque Country (UPV/EHU), Los Apraiz Street 2, 01006 Vitoria-Gasteiz, Spain;* ²*Department of Constitutional Law and History of Political Thought, Faculty of Labour Relation and Social Work, University of the Basque Country (UPV/EHU), Postbox: 644, 48080 Bilbao, Spain; amaia.inza@ehu.eus*

Abstract

The entrenchment of food aid raises numerous questions about its effects on current societies. On the one hand, public administrations have lost responsibility for managing the right to food of people in vulnerable situations. On the other hand, the third sector has become a fundamental actor, replacing public concern for the right to food. Along with this, the charity economy has emerged, taking advantage of food waste and food surplus distribution circuits. This paper will account for the advances and trends in the analysis of the phenomenon of food aid through a logical-critical reflection based on a comprehensive review of specialized bibliography. The above elements will be described as part of a depoliticization process. This process hides the effects of food aid on the lives of the most vulnerable people, who obtain food in a stigmatizing way, outside of a normalized consumer society. In addition, it makes it difficult to analyse the origin of food insecurity.

Keywords: poverty, high income countries, responsibility, surplus food

Introduction

The voluntary third sector has partly taken the place of public institutions when responding to the right to food of people in vulnerable situations. Three concatenated phenomena have gained strength in this process: the widely accepted idea that the response to food insecurity can come from third-sector voluntary organizations, the business opportunity for companies to redirect surplus food to food aid organizations and, lastly, the process of depoliticization that affects the assignment of responsibilities in relation to the right to food.

This work defends, through a logical-critical reflection based on specialized bibliography, that the established dynamics reinforce the links between these elements referenced above. The main consequence of this is that it has become a path of difficult return. The fundamental parts of the text pose: an approach to the widely legitimized shared vision of food aid as a response to hunger in high-income societies; the so-called charity-economy, arising from the economic productivity of food surpluses that companies redirect to food aid resources; and the creation of a third sector shadow state, a direct consequence of the depoliticization process.

Solidarity in response to food insecurity

Food security exists when ‘all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life’ (FAO, 1996). But in high-income countries, it also means that people obtain food in a dignified manner and in accordance with social norms (Dowler and O’Connor, 2012: 45). In other words, from the point of view of food insecurity, it is defined ‘as the household-level economic and social condition of limited access

Section 7

to food' (Mook *et al.*, 2020) and is not only addressed to the homeless people or refugees from richer countries, but increasingly to people with jobs and housing, but facing sudden or ongoing uncertainties (Dowler and O'Connor, 2012: 48). The prevalence of food insecurity in households is relatively high in some developed countries, ranging between 8% and 20% of the population, and constitutes a serious public health problem in rich countries with developed economies (Pollard and Booth, 2019).

According to Evans and Shield (2000), the process of transferring many social support functions to the non-government voluntary sector is part of the neo-liberal desire to disinvest responsibilities for various citizenship rights in the social and economic spheres, and in the process, transform the state's caring role in society. Increasingly, personal success or failure is understood as a business virtue or personal failure (Harvey, 2009), and it is less and less social, a risk of one's own existence, according to which the person is considered more responsible for their own risk and the way to cover it (Laval and Dardot, 2003).

Several authors consider that hunger in high-income countries is a matter of distributive justice and human rights, and is a consequence of the damaging impact of neoliberal economic ideology on the right to food of the most vulnerable people (Riches and Silvasti, 2014). From a situation in which the response to food insecurity in emergency situations is in the hands of the third sector, we have moved on to the consolidation of food aid resources as a stable, structured solution and, what is more important, efficient according to economic criteria, so this way, its expansion should be seen as 'an established social matter of fact' (Lorenz, 2012). Globally 'the current focus distracts attention away from the ineffectiveness of government policies in addressing the social determinant of food insecurity' (Pollard and Booth, 2019).

Through the institutionalization of food aid resources, personal generosity is legitimized as a response to the great social and economic dislocation (Poppendieck, 1999), as a beneficial theme through discourses on responsibility and participation, where the solution is the responsibility of the community (Carson, 2013/14: 16). The problem can be seen as an 'intractable policy controversy', as a particularly stubborn or resistant to change issue, due to its framing (McIntyre *et al.*, 2016).

Food banks and food charities possess a limited ability to answer the social and material needs of people (Caraher and Davison, 2019: 7), and runs the danger of addressing a problem which has deeper roots with a short-term band-aid (Caraher and Furey, 2017:17). They do not ameliorate severe household food insecurity (Holmes *et al.*, 2019: 141) and can better meet the needs of shorter- versus longer term users (Black and Seto, 2020: 867), but have become a source of food for the chronically hungry, a role they were never designed to assume (Elmes *et al.*, 2015:1). Such a purported solutions to food poverty may potentially contribute to its normalization while failing to address the reasons for its existence (Caplan, 2017).

Charity economy as an end

In general, charitable operations through food aid resources are seen as common sense responses, a practical and simple solution to the problems of hunger and food waste (Power, 2015). The third sector has had a great capacity both to establish relationships between different actors, when most welfare state regimes have withdrawn (Baglioni *et al.*, 2016). Specifically, food banks are one vital site 'taking on the work' and 'filling the gaps' in the emerging landscape of intervention that operates at ground-level to support people in negotiating the impacts of austerity (Strong, 2018). Non-profit action related to food poverty, particularly food recovery and redistribution, has led to social innovation filling the gap determined by the lack of public intervention (Baglioni *et al.*, 2016).

The charity emergency food provision includes a provision of food outside the main market (Lambie-Mumford and Silvasti, 2020: 222). This system of free distribution of basic surplus goods or sold at discount prices to those in need through volunteers, Kessl *et al.* (2020) call it 'new charity economy':

The expansion of such distribution and sales outlets is part of a major re-establishment in the political battle against poverty; although it is assigned to civil society, it is also linked to and integrated in the social services of the (welfare) state and, increasingly, the economic sphere. (Kessl *et al.*, 2020: 362)

In this 'new charity economy' (Kessl *et al.*, 2020: 361, 369), people who are no longer or only partly able to participate in the given market economy are referred to a secondary supply system of surplus goods from the dominant capitalist market, and operates outside of the welfare state's framework; places non-monetary benefits alongside statutory social insurance, supply of welfare structures as a subsidy for the needy; sometimes it even replaces them. The charity economy itself has become an integral part of the modern welfare (state) arrangement: Food banks and similar organizations can therefore be understood as a sign for the transformation of welfare (state) arrangements and a symbol for change within the fabric of our societies (Schoneville, 2018).

The depoliticization dynamic

The context from which we start to understand this phenomenon should not ignore the austerity strategy, which is based on the fact that strategies of fiscal constraint can, counter-intuitively, produce expansionary effects in national economies, increasing private consumption and investment and producing growth in Gross Domestic Product (Clarke and Newman, 2012). This neoliberal austerity marks a retreat from welfare state interventionism grounded in neo-Keynesian political economy (Taylor-Gooby *et al.*, 2017: 11) and designs and establishes market-based and market-driven institutions and practices (Cerny, 2008). The broadest spectrum of influence of these austerity policies must be considered, as Strong (2020) has stated:

the austerity has created a 'double-bind' for impoverished communities and most marginalized: previous redistributive policies are reversed, but also future forms of economic and ethical responsibility for life outcomes are shifted away from the centralized state and rather than dealing with the structural causes of poverty and hunger, austerity involves a territorial reworking of the state through which forms of care, social reproduction and intervention are increasingly sourced from communities themselves. (Strong, 2020: 212)

Furthermore, notions of scarcity in a period of austerity have shaped materially insufficient and stigmatizing welfare system, and a particular moral economy of scarcity has become embedded at the level of common-sense (May *et al.*, 2019). Added to this is the effect of New Public Management, adopted by many governments since the 1980s, which is the shift of responsibility to other levels of government; a governance in which the state must collaborate with a wide range of actor in networks that cut across the public, private and voluntary sectors, and operate across different levels of decision making (Newman *et al.*, 2004: 204). Governments have attempted to shift the focus towards various forms of co-production with other agencies and with citizens themselves through partnerships, community involvement and strategies of 'responsibilisation' (Jenson, 2009). The New Public Management can be defined as a tool in neoliberal efforts to transform public services into market mechanisms and management (Davidson, 1993), while other core values such as equality, equity and participation are de-emphasised (Gregory, 2007). Additionally many non-governmental organizations have lost their traditional critical voice,

Section 7

as they are captured by the state through performance, contracts and partnership arrangements in the delivery of state services (Spolander *et al.*, 2015: 641).

This is directly related to how the response to food insecurity has been constructed; food aid resources can be seen as secondary extensions of weakened social safety nets (Silvasti and Riches, 2014), or even shadow state welfare institutions, following the expression of Mitchell (2010), helping to consolidate original economic policies of neoliberalism in a hegemonic process. Voluntary organizations can be considered as manoeuvring areas for issues that are difficult to solve, relieving the government of its responsibilities (Ronson and Caraher, 2016: 85). In the European context, the welfare state has integrated and (therefore controls) the new charity economy into its socio-political order and it is also observed an indirect collaboration between public social and welfare authorities and the services of the new charity economy (Kessl *et al.*, 2020: 369, 371).

The current approach distracts from the ineffectiveness of government policies and responsibilities in addressing the social determinants of food insecurity and depoliticizes hunger (Pollard and Booth, 2019). In relation to the latter, as Busso maintains (2017: 436-7), depoliticization can be seen as a product of the individualization of society; the disappearance of a collective interest frees collective actors and politics from the responsibility of ensuring well-being. According to this author, the self-organization of communities is one of the processes that fosters the growth of third-sector organizations, which become important public collective actors in the planning of social policies. Such politicization is an inherent component of neoliberal rationality (Foster *et al.*, 2014: 230); it is a political game played by state actors to achieve specific political goals, and what is 'squeezed out' by depoliticization is not politics itself, but, among others, responsibility and blame (Foster *et al.*, 2014: 229).

Conclusions

The three concatenated phenomena referred to in this work show a logical way of responding to food insecurity through voluntary third-sector organizations. They take advantage of part of the food waste through donations from companies, which obtain an economic return on the part of the stock that would otherwise be expensive to eliminate. But we should not look at increased food aid resources as a proportional response to rising food insecurity. Or, at least, not just like that. The reality indicates that behind it lies an ideologically defined way of seeing poverty in high-income societies. Thus, the established system strengthens the solidarity response of the third sector, and people in vulnerable situations obtain food in a way that is often stigmatizing. Having to take advantage of the leftovers of the system, outside the circuit of the consumer society.

All of the above is part of a broader depoliticization process, with a long history. The use of surplus food through food aid resources, therefore, far from following a clean win-win logic, facilitates the disregard of public institutions with respect to the right to food of the most vulnerable population.

References

- Baglioni, S., De Pieri, B. and Tallico, T. (2016). Surplus food recovery and food aid: the pivotal role of non-profit organisations. Insights from Italy and Germany. *VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations* 28: 2032-2053.
- Black, J.L. and Seto, D. (2020). Examining Patterns of Food Bank Use Over Twenty-Five Years in Vancouver, Canada. *VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations* 31: 853-869.
- Busso, S. (2017). The de-politicization of social policy at the time of social investment. Mechanism and distinctive features. *Partecipazione e Conflitto* 10 (2): 421-447.

- Caraher M and Davison R. (2019). The normalisation of Food Aid: What happened to feeding people well?. *Emerald Open Research* 1:3. Available at: <https://doi.org/10.12688/emeraldopenres.12842.1>
- Caplan, P. (2017). Win-win? Food poverty, food aid and food surplus in the UK today. *Anthropology Today* 33, 3: 17-22.
- Caraher, M. and Furey, S. (2017). Is it appropriate to use surplus food to feed people in hunger? Short-term band-aid to more deep-rooted problems of poverty. London: Food Research Collaboration, Centre for Food Policy
- Carson, E.A. (2013/14). Canadian Food Banks and the depoliticization of food insecurity at the individual and community levels. *Canadian Review of Social Policy* 70: 7-21.
- Cerny, P.G. (2008). Embedding neoliberalism: the evolution of a hegemonic paradigm. *The Journal of International Trade and Diplomacy*, 2 (1): 1-46
- Clarke, J. and Newman, J. (2012). The alchemy of austerity. *Critical Social Policy* 32 (3): 299-319.
- Davidson, J. (1993). *Privatisation and employment relations: The case of the water industry*. London: Mansell.
- Dowler, E.A. and O'Connor, D. (2012). Rights-based approaches to addressing food poverty and food insecurity in Ireland and UK. *Social Science&Medicine* 74: 44-51.
- Elmes, M.B., Mendoza-Abarca, K. and Hersh, R. (2015). Food Banking, Ethical Sensemaking, and Social Innovation in an Era of Growing Hunger in the United States. *Journal of Management Inquiry* 25 (2): 1-17.
- Evans, B.M. and Shields, J. (2000). Neoliberal restructuring and the third sector: reshaping governance, civil society and local relations, Centre for Voluntary Sector Studies, Ryerson University Working Paper Series 13. Available at: <http://www.ryerson.ca/~cvss/WP13.pdf>
- FAO (1996). Rome Declaration on World Food Security. FAO: Rome. Available at: <https://digitallibrary.un.org/record/195568?ln=es>
- Foster E.A., Kerr P. and Byrnes C. (2014). Rolling back to roll forward: depoliticisation and the extension of government. *Policy&Politics* 42 (2): 225-41.
- Gregory, R. (2007). New public management and the ghost of max weber: Exorcized or still haunting? In: Christensen, T. and Lægred, P. (eds.), *Transcending new public management. The transformation of public sector reforms*. Surrey: Ashgate, pp. 387-422.
- Harvey, D. (2009). *Breve historia del neoliberalismo*. Madrid: Akal.
- Holmes, E., Fowokan, A., Seto, D., Lear, S.A. and Black, J.L. (2019). Examining food insecurity among food bank members in Greater Vancouver. *Journal of Hunger and Environmental Nutrition* 14 (1-2): 141-154.
- Jenson, J. (2009). Redesigning citizenship regimes after neoliberalism. Moving towards social investment. In: Morel, N., Palier, B. and Palme, J. (eds.) *What Future for Social Investment?*, Stockholm: Institute for Futures Studies.
- Kessl, F., Oechler, M. and Schröder, T. (2020). Charity economy and social work. In: F. Kessl, F.; Lorenz, W.; Otto, H.-U. and White, S. (eds.) *European social work-A Compendium*. Leverkusen/Farmington Hills: Bucrich Publishers, pp. 361-378
- Lambie-Mumford, H. and Silvasti, T. (2020). Conclusion: food charity in Europe. In: Lambie-Mumford, H. and Silvasti, T. (ed.). *The rise of food charity in Europe*. Briston: Policy Press, pp. 219-241
- Laval, C. y Dardot, P. (2013). *La nueva razón del mundo*. Barcelona: Gedisa
- Lorenz, S. (2012). Socio-ecological consequences of charitable food assistance in the affluent society: the German Tafel. *International Journal of Sociology and Social Policy* 32 (7/8): 386-400.
- May, J., Williams, A., Clocke, P. and Cherry, L. (2019). Food banks and the production of scarcity. *Transactions of the Institute of British Geographers* 45 (1): 208-222.
- McIntyre, L., Patterson, P.B. and Mah (2016). A framing analysis of Canadian household food insecurity policy illustrates co-construction of an intractable problem. *Critical Policy Studies*, 12 (2): 149-168. Available at: <https://doi.org/10.1080/19460171.2016.1253491>
- Mitchell, K. (2010). Transnationalism, neo-liberalism, and the rise of the shadow state. *Economy and Society* 30 (2): 165-189.
- Mook, L., Murdock, A. and Gundersen, C. (2020). Food Banking and Food Insecurity in High-Income Countries. *VOLUNTAS: International Journal of Voluntary and Nonprofit Organizations* 31: 833-840. Available at: <https://doi.org/10.1007/s11266-020-00219-4>
- Newman, J., Barnes, M., Sullivan, H. and Knops, A. (2004). Public participation and collaborative governance. *Journal of Social Policy* 33 (2): 203-223. Available at: <https://doi.org/10.1017/S0047279403007499>

Section 7

- Pollard, C.M. and Booth, S. (2019). Food insecurity and hunger in rich countries. It is time for action against inequality. *International Journal of Environmental Research and Public Health* 16 (10), 1804. Available at: <https://doi.org/10.3390/ijerph16101804>
- Poppendieck, J. (1999). *Sweet Charity: Emergency Food and the End of Entitlement*. New York: Penguin Books.
- Power, E.M. (2015). Food Banks. In: Albala, K. (ed.). *The Sage encyclopedia of food issues*. (vol.2). Londres: Sage Publications, pp. 552-7.
- Riches G and Silvasti, T. (2014). Hunger in the rich world: food aid and right to food perspectives. In: Riches, G and Silvasti, T. (eds.). *First world hunger revisited. Food charity or the right to food?*. Basingstoke: Palgrave Macmillan, pp. 1-14.
- Ronson, D. and Caraher, M. (2015). Food Banks: Big society or Shunting Yards? Successful Failures. In: Caraher, M. and Coveney, J. (Eds). *Food Poverty and Insecurity: International Food Inequalities*. Switzerland, Springer.
- Schoneville, H. (2018). Poverty and the transformation of the welfare (state) arrangement. Food banks and the charity economy in Germany. *Social Work and Society. International Online Journal* 16, 2. Available at: <https://ejournals.bib.uni-wuppertal.de/index.php/sws/article/view/570>
- Silvasti, T. and Riches, G. (2014). Hunger and food charity in rich societies: what hope for the right to food?. In: Riches, G. and Silvasti, T. (eds.). *First world hunger revisited. Food charity or the right to food?*. Basingstoke: Palgrave Macmillan, pp.191-208
- Spolander, G., Engelbrecht, L., Martin, L., Strydom, M., Pervova, I., Marjanen, P. and Adaikalam, F. (2015). The implications of neoliberalism for social work: Reflections from a six-country international research collaboration. *International Social Work*, 57: 301-312
- Strong, S. (2018). Food banks, actually existing austerity and the localisation of responsibility. *Geoforum* 110: 211-219. Available at: <https://doi.org/10.1016/j.geoforum.2018.09.025>
- Taylor-Gooby, P., Leruth, B. and Chung, H. (2017). How European welfare states have responded to post-industrialism, ageing populations, and populist nationalism. In: Taylor-Gooby, P., Leruth, B. and Chung, H. (ed.). *After austerity. Welfare state transformation in Europe after the great recession*. Oxford: Oxford University Press, pp. 1-26.

60. A discourse analysis on eating dog meat in South Korea for 20 years

S. Joo* and M.S. Chun

Center for Animal Welfare Research, Research Institute for Veterinary Science, College of Veterinary, Gwanak-gu, Gwanak-ro 1, Seoul, 08826, South Korea; jsa321@snu.ac.kr

Abstract

This study analysed the discourse on the consumption of dog meat in Korea over the past 20 years based on newspaper articles and opinion polls. A text-mining method was used with the newspaper articles to identify trends in social issues about dog meat. Additionally, the trends on the agreement of dog meat consumption were reviewed through public surveys and public inquiry. By comparing the discourse moving from cultural relativism to pro-animal movements and political issues by era, this study provides insight into understanding the opinions and arguments of stakeholders on the animal and food policies of Korean dog meat.

Keywords: dog meat, discourse analysis, text-mining, biopolitics, animal welfare

Introduction

Eating dog meat, especially in terms of food hygiene, public health, and animal welfare, has been a controversial issue for decades in South Korea. However, dog meat-producing practices are still maintained in the gray zone of unclear legal implementation in South Korea. There is strong support for banning dog meat based on rapid changes in the general attitude toward animals, increasing pet population, and ethical consumption trends. However, dog meat producers are strongly opposed to it. Public surveys are critical and essential to the functioning of a political arrangement for any democratic society (Berinsky, 2017). Thus, exploring surveys and their impacts are essential for scrutinizing the construction of discourses and knowing how the interested parties constructed the controversy. However, depending on the subjects of the surveys, public opinion on dog meat consumption was found to be inconsistent. Therefore, the dog meat issue is a nightmare for policy makers. ‘The Social Consensus Committee on Eating Dog Meat Issue’ was established in December 2021 to find common ground among interested parties including dog meat producers, animal protection activists, consumers, academics and governmental agencies. They are still arguing about the different results on public opinion.

This study analysed the opinion trends on dog meat consumption in newspaper articles and public opinion polls about dog meat consumption in the 2000s. Because the media has a vital role in the public perception and acts as a forum for discourse on a phenomenon, analysing the media itself enables the interpretation of reality (Jang, 2013). Moreover, public surveys were reviewed in the perspective of who gave the surveys and what questions were asked to show how the controversy was constructed on dog meat issues. The result is expected to contribute to help find the public consensus and to build policy on banning dog meat.

Methods

Our data set consisted of 3,083 news articles from 2000 to 2021 that contained the keyword ‘dog meat’ or ‘dog meat consumption’ on the News Big Data Analytics Services (<https://www.bigkinds.or.kr>). According to the two critical issues on dog meat, an amendment of the Animal Protection Law

Section 7

with prohibition of animal abuse with detailed articles in 2008 and the conviction of animal cruelty by killing dogs with electricity in 2018, we divided the articles into three phases: phase 1 (2000-2007), phase 2 (2008-2017), and phase 3 (2018-2021). We analysed the extracted words from these articles using NetMiner 4.0. To convert large volumes of text into meaningful summaries, we did text-mining by topic modelling (TF-IDF >0.2 , words length >2 , $a=0.1$, and $b=0.01$). In the topic modelling process, each topic consisted of automatically allocated keywords by the program with a function of a high probability of correlation and frequency in the documents using the Latent Dirichlet Allocation (LDA) algorithm (Blei, 2003). Topic modelling is a method that reduces the complexity of a large corpus by representing each text as a combination of topics, as clusters of words that reappear across texts, and clarifies the implicit understanding of meaning-making in text with high internal validity and theoretical compatibility (Jacobs, 2019). For discourse analysis attempts to understand how ideas and realities are socially constructed, conveyed, and interpreted in a situation, the topic modelling method can help the analysis to identify the change of the main themes and topics on discourses by phase (Rabitz, 2021). In addition, questionnaires and results of 16 public surveys (3 surveys in phase 1, 3 surveys in phase 2, and 10 surveys in phase 3) on dog meat issues conducted in the 2000s were investigated.

Results

Topic modelling of news articles

In total 1,055 articles in phase 1, 1,153 articles in phase 2, and 875 articles in phase 3 were analysed. Through the topic modelling of the articles, three topics with the 5 top keywords were extracted from each phase. The topics were labelled for the interpretation of words clusters, and the topics were classified. The results are presented in Table 1. In phase 1, the first topic was classified as '*criticism during the 2002 World Cup*.' This topic included the keywords 'culture,' 'animals,' 'World Cup,' 'France,' and 'Japan.' Around the 2002 Korea-Japan World Cup, French actor Brigitte Bardot's fierce criticism sparked a cultural relativism discourse about eating dog meat through the media. Topic 2 was labelled as '*cultural and historical meaning*,' containing articles related to the history of dog meat in Korea and anecdotes about dog consumption or dogs for food. Topic 3 was interpreted as '*food for health*.' The linking terms were 'food,' 'Bosin-tang (dog meat soup),' 'cuisine,' 'health,' and 'physical constitution.' Dog meat is believed to be good for the health and is eaten during the hottest period of summer (from mid-July to mid-August). This myth is linked to Confucianism and masculinity (Dugnoille, 2018). These topics represent social conflicts, cultural description and dietary subjects on dog consumption in this phase. The first topic in phase 2 was labelled as '*Anti-dog meat activities of the Animal protection group*.' This topic included words like 'animal,' 'dog (meat) consumption,' 'animal protection group,' 'market,' and 'protection.' From this period on, the activities of animal protection groups (APGs) have been remarkable. They launched strong anti-dog meat campaigns at traditional markets or streets. Topic 2 contains a discourse on '*social issues on dog meat consumption*.' Especially, related articles were about a gift of dog meat given to the former US ambassador Mark Lippert. When he was attacked by a Korean Chauvinist, the majority of Koreans were worried about his recovery. At that time, a citizen tried to send the ambassador dog meat to aid in his fast recovery; however, the man was restricted from entering by hospital staff and extremely criticized by the public. This topic includes the terms 'Korea,' 'US,' 'culture,' 'US ambassador,' and 'world.' We labelled the third topic as '*the history of dog meat cuisine*.' The most frequent terms of topic3 were 'food,' 'cuisine,' 'meat,' 'Joseon Dynasty,' and 'invigoration of health.' While the topics in this phase still represent cultural and historical issues and social debates on dog meat, they also represent the considerable influence of the animal welfare perspective and the movement on anti-dog meat. In the third phase, the keywords 'slaughter,' 'markets,' 'livestock,' 'companion,' and 'government' were grouped into topic 1. This topic contents are characterized as '*Legal and political actions on dog meat issues*.' The discourses are related to the conviction of animal cruelty by the slaughter of dogs with electricity in 2018 and institutional intervention to decrease the size of the dog meat industry. Topic

2 was labelled as ‘Controversy over dog meat during the Olympics.’ This topic combines content about the boycott and criticism related to dog meat consumption during the 2018 Pyeong-Chang Winter Olympics. The last topic appears with the words ‘farm,’ ‘companion,’ ‘rescue,’ ‘protection,’ and ‘Korea.’ This topic 3 was labelled as ‘rescue and adoption dogs from dog farms,’ indicating the activities of APGs for rescue dogs from poor farm environments and getting them adopted as companion animals. The topics represent political discourses, social disputes, and the animal welfare movement in this phase.

Review of the surveys

There were differences in the survey agents and specific items of the questionnaires in each phase as seen in Table 2. During the first phase (2000-2007), there were 3 surveys on dog meat consumption (1 survey in 2001 and 2 surveys in 2006). All the research was conducted by the media (news and web portals). The main questions over the surveys were about whether the public considered eating dog meat as Korean culture. In the survey in 2001, 92.96% of participants considered Brigitte Bardot’s criticism of dog meat consumption as ignorance of Korean culture. Moreover, 86% of the participants answered that there was no need to eradicate the dog consumption practice because of cultural differences in the survey from 2006. However, from another survey in the same year, 43.5% were opposed to the ‘dog meat culture.’ In this phase, public opinion on dog meat consumption was presented by media companies. Depending on the characteristics (progressive, conservative or neutral) of the press companies, the results varied. Generally, conservatives were more supportive for dog meat consumption. In phase 2 (2008-2017), APGs became the main survey agents and led surveys with media companies (broadcasting). Questions about public opinion on the legalization of eating dog meat predominantly appeared in surveys given by media companies while questions about the legal prohibition of eating dog meat mainly emerged in surveys by APGs. The enactment of the Prohibit Act for dog consumption is suggested based on social

Table 1. Results of the topic modeling.¹

Phase	Topic	Keywords (top 5)	Label	Category
1 (2000-2007)	1	culture, animal, World Cup ¹ , France, Japan	Criticism during the 2002 World Cup	Social
	2	society, culture, politics, dog thief, North Korea	The cultural and historical meaning	Cultural
	3	food, <i>Bosin-tang</i> ² , cuisine, health, physical constitution	Food for health	Dietary
2 (2008-2017)	1	animal, dog consumption, animal protection group, market, protection	Anti-dog meat activities of Animal protection group	Animal welfare
	2	Korea, US, culture, US ambassador ³ , world	Social issues on dog meat consumption	Social
	3	food, cuisine, meat, Joseon Dynasty, invigoration of health	History of dog meat cuisine	Cultural
3 (2018-2021)	1	slaughter, market, livestock, companion, government	Legal and political actions on dog meat issues	Political
	2	Korea, China, Olympics ⁴ , culture, food	Controversy over dog meat during Olympics	Social
	3	farm ⁵ , companion, rescue, protection, Korea	Rescue and adoption from dog farms	Animal welfare

¹ Refers to 2002 Korea-Japan World Cup.

² *Bosin* means invigoration of health, *tang* means soup in Korean. This term is generally used to euphonize dog meat.

³ Refers to Mark William Lippert, US ambassador of Korea in 2014-2017.

⁴ Refers to 2018 Pyeong-Chang Winter Olympics.

⁵ Refers to dog farms which are raising dogs for selling for food.

https://www.wageningenacademic.com/doi/book/10.3920/978-90-8686-939-8 - Wednesday, December 14, 2022 7:49:12 AM - IP Address: 185.128.124.75

Section 7

disapproval of dog meat consumption. Meanwhile, 53.2% of participants agreed on legitimate dog meat production in the 2008 survey. However, years later, approval of legal prohibition of dog meat production rose from 30.6% in 2011 to 46.3% in 2016. Public opinion on banning dog meat industries such as dog farms and restaurants was asked in APG surveys. From these surveys by the same APG in 2011 and 2016, agreement on banning dog meat industries increased from 41.7 to 57.5% while opinions on the pros of dog meat fell from 30.8 to 26.3%. In this phase, the main opposing interested parties on dog meat issues were the dog meat producers and APGs while government took a passive institutional intervention on public health issues related with the dog meat industry.

In the last phase, 10 surveys were conducted, even though it was a shorter period than the other two phases. APGs accounted for the largest percentage of the survey agents during this period (50%), and media (News and broadcasting) and polling agencies were the other main agents. In addition, local government (province-level) first appeared as an agent of the survey. Surveys of this period mainly inquired about the public opinion on the need for a legal ban on dog slaughter (industry level) or eating dog meat (individual level). The responses showed more opposition to the legal ban on individuals while there was a relatively high consensus for the major opinion on the legal ban on dog meat industries. On the other hand, 'edible dogs' and 'companion dogs' were conceptualized in a press company survey (2021), indicating the compartmentalization of dogs (Podberscek, 2009; Herzog, 2011). While, in APG surveys, some of the questions and statements focused on equal care for every dog. Still, APGs were the main interested parties on dog meat issues in this phase; however, the government became an active party on the discourse of banning dog meat consumption, which reflected the majority of the public's approval. Questions about dog meat-eating experiences and opinions or attitudes on eating dog meat were the most frequent in all the surveys, regardless of the phases and survey agents. The responses about dog meat-eating experiences and opinions or attitudes toward eating dog meat showed significant changes with less people eating dog meat through the last 20 years.

Table 2. Surveys of public opinion on eating dog meat over the past 20 years.

Phase	No.	Survey agents	Date	Size (n)
1	1	Kookmin Daily Newsletter (press company)	2001	3,081
	2	Empas (press company)	2006	3,061
	3	Daum (press company)	2006	7,900
2	4	CBS (press company)	2008	700
	5	Care (animal protection group)	2011	1000
	6	Care (animal protection group)	2016	1000
3	7	Last Chance for Animals (animal protection group)	2018	1000
	8	CBS (press company)	2018	501
	9	Korean Animal Welfare Association (animal protection group)	2018	1,006
	10	Last Chance for Animals (animal protection group)	2018	501
	11	Korean Animal Welfare Association (animal protection group)	2019	1,500
	12	Humane Society (animal protection group)	2020	1000
	13	Gyeonggi-do (local government)	2021	1000
	14	CBS (press company)	2021	1,012
	15	R & Search (polling company)	2021	1,132
	16	OhmyNews (press company)	2021	500

Discussion

According to Foucault, the 'truth' cannot be established, consolidated, or implemented without the production, accumulation, circulation, and functioning of discourse (Foucault, 1980; Palmer, 2017; Chrulw, 2017). Therefore, the discourse constructed by the media affects social issues about animal welfare and the public's perception about animals (von Essen, 2020; Shani, 2009; O'Sullivan, 2016). There were significant changes in the discourse in the media about dog meat issues during the last 20 years in Korea. Discourses on dog meat consumption in the media shifted from cultural relativism to pro-animal movements and political issues for animal protection. The main contents of the public polls also were extended from the agreement of eating dog meat as a cultural matter to an attitude against the dog meat industry and legal prohibitions. The findings of this study showed that the public is becoming more concerned about dogs as living beings and their welfare status than their cultural meaning over the last 20 years. APGs acted as the main agents with the help of the media to lead the shift of public opinion on animal suffering. The public concern about animals led to a shift in the issue on dog meat consumption from a pro-con debate to political intervention. It was a process of changing the biopolitical discourse on dogs from a source of meat to living creatures that need protection, which connects social, political, and human-animal relationship perspectives (Foucault, 1980; Chrulw, 2017).

Conclusions

This study analysed the discourses on dog meat consumption in Korea over the last 20 years based on newspaper articles and public surveys. By comparing the shift in discourses from cultural relativism to pro-animal movements and political issues by period, we provided insights that can be used for a discourse analysis with connections between the media, social norms, political intervention and the changes in human-animal relationship around dog meat consumption.

References

- Berinsky, A.J. (2017). Measuring public opinion with surveys. *Annual review of political science*, 20, 309-329.
- Blei, D., Ng, A. and Jordan, M. (2003). Latent dirichlet allocation. *Journal of Machine Learning Research*, 3, 993-1022.
- Chrulw, M. (2017). *Foucault and Animals*: Brill Academic.
- Dugnoille, J. (2018). To eat or not to eat companion dogs: symbolic value of dog meat and human-dog companionship in contemporary South Korea. *Food, Culture & Society*, 21(2), 214-232.
- Foucault, M. 'Two Lectures' in *Power/Knowledge: Selected Interviews and Other Writings 1972-1977*, ed. Colin Gordon (Brighton: Harvester Press, 1980), 78-108 (99).
- Herzog, H. (2011). Having Your Dog and Eating It Too?
- Jacobs, T. and Tschötschel, R. (2019). Topic models meet discourse analysis: A quantitative tool for a qualitative approach. *International Journal of Social Research Methodology*, 22(5), 469-485.
- Jang, M. (2013). Multicultural Discourse Analysis in Media. *Multicultural Education Studies*, 6(3), 157-179.
- O'Sullivan, S. (2016). Animals and the politics of equity. *The political turn in animal ethics*, 51-68.
- Palmer, C. (2017). 5 'Taming the wild profusion of existing things'? A study of Foucault, power, and human/animal relationships. In *Foucault and animals* (pp. 105-131). Brill.
- Podberscek, A.L. (2009). Good to Pet and Eat: The Keeping and Consuming of Dogs and Cats in South Korea. *Journal of Social Issues*, 65(3), 615-632.
- Rabitz, F., Telešienė, A. and Zolubienė, E. (2021). Topic modelling the news media representation of climate change. *Environmental Sociology*, 7(3), 214-224.
- Shani, A. and Pizam, A. (2009). 'Tourists' attitudes toward the use of animals in tourist attractions.' *Tourism Analysis*, 14(1), 85-101.
- von Essen, E., Lindsjö, J. and Berg, C. (2020). 'Instagranimal: Animal Welfare and Animal Ethics Challenges of Animal-Based Tourism'. *Animals*, 10(10), 1830. Retrieved from <https://www.mdpi.com/2076-2615/10/10/1830>

An agile and responsive third sector

During Covid-19, third sector organisations like Food Train stepped up to support the public health response and local recovery, supporting vital food access, prevention of malnutrition and tackling loneliness (Carruthers et al, 2020), often before local government could mobilise. Food Train is a registered charity, voluntary organisation and social enterprise working across Scotland, UK. Uniquely Food Train was developed by older people, for older people and is driven by the lived experience of its older members, who from the outset recognised the increasing vulnerabilities older people faced, combined with the lack of support to access food, as they aged. Since 1995 it has focused on its mission to tackle the interconnected public health issues of social isolation, loneliness, food insecurity and malnutrition among frail, vulnerable and isolated older people by helping them live well at home through food access. Teams of volunteers help with a weekly grocery shopping and delivery service with household support, meal-sharing and befriending for those over 65 years. Their services are individualised to the needs and wishes of their older age members, ensuring that food shopping can be delivered, and if necessary, prepared in a dignified and secure way.

The Eat Well Age Well Project

Food Train jointly hosted the Malnutrition Summit in 2015 with Scottish Government (Community Food and Health Scotland, 2015) and in 2018 Food Train expanded its services to include its impact and evidence project Eat Well Age Well which is a Scotland wide project working across all sectors to raise awareness and tackle malnutrition (as under-nutrition) among older people living at home. Malnutrition occurs when a person's diet does not meet their nutrition needs and Eat Well Age Well's work particularly focuses on undernutrition (Eat Well Age Well, 2022) and on prevention in the community, as 93% of malnutrition originates in the community (Bapen, 2022).

The project works across the following strands of work: (1) capacity building; (2) screening and early intervention; and (3) policy and communications. To do this, Eat Well Age Well raise awareness and educates at a national level, about the interaction between the risk factors for malnutrition which may span across physical, psychological and social risk. The project also collects data on the prevalence of malnutrition in the community and campaigns and advocates for policy and practice change at local and national level (Eat Well Age Well, 2022).

Collaboration exists across all themes and at all levels of engagement within the Eat Well Age Well Project. For example, the project is supported by a multi-agency stakeholder group, partnership agreements with the Malnutrition Task Force and the British Dietetic Association and the project has built strong working relationships with multiple stakeholders including Age Scotland, Health & Social Care Alliance, Independent Age, Red Cross and UK partners including the Malnutrition Task Force and the Malnutrition Awareness & Prevention Network (MAPN). The support and endorsement from multiple stakeholders demonstrates how cross-cutting the issues of food security, malnutrition, social isolation and loneliness are.

Eat Well Age Well was initially funded by the National Lottery Community Fund which ran from March 2018 – March 2021 and phase 2 continued funding was secured from Scottish Government which demonstrates the success of the program. Achievements in the first 4 years include: 4 national dissemination events; 27,000 people have been engaged about Eat Well Age Well, issuing over 2,900 toolkits across Scotland; collaboration with 500 community groups; 700 carers, volunteers, befrienders and health and social care staff have been trained on malnutrition, food security and unintentional weight loss in the community; 2,000 older people have been screened for the early identification of malnutrition and funding of 57 grants which have supported over 600 older people delivering 2,854 hot meals.

Academic research collaboration

Collaborative working with academics has been vital to support building the evidence base to share with policy-makers. In 2019, Eat Well Age Well commissioned research with the University of Glasgow working with Food Train to develop understandings on the role of food security and malnutrition risk with psychosocial indicators of healthy ageing (Reid et al, 2019). Findings from this research with 169 older-age adults found food support services such as Food Train are vital to supporting vulnerable older adults to age healthily at home. In particular, the research found, the services, and volunteers, enable a greater sense of control and autonomy for older people, particularly around food access and social connectedness (Reid *et al.*, 2020).

The research findings emphasised the ‘physical need for food must be paired in the context of meaningful social interactions in order to reduce the risk of isolation and loneliness which create a vicious cycle of under-eating, poor self-care and low mood’ (Figure 1). A key recommendation was that policy-makers must urgently make these vital services available for all older people of Scotland, but, particularly for those who are already vulnerable and isolated. This primary research has reached beyond academia and generated media headlines, which has helped to raise awareness and shape policy action (The Scotsman, 2020; Third Force News, 2020).

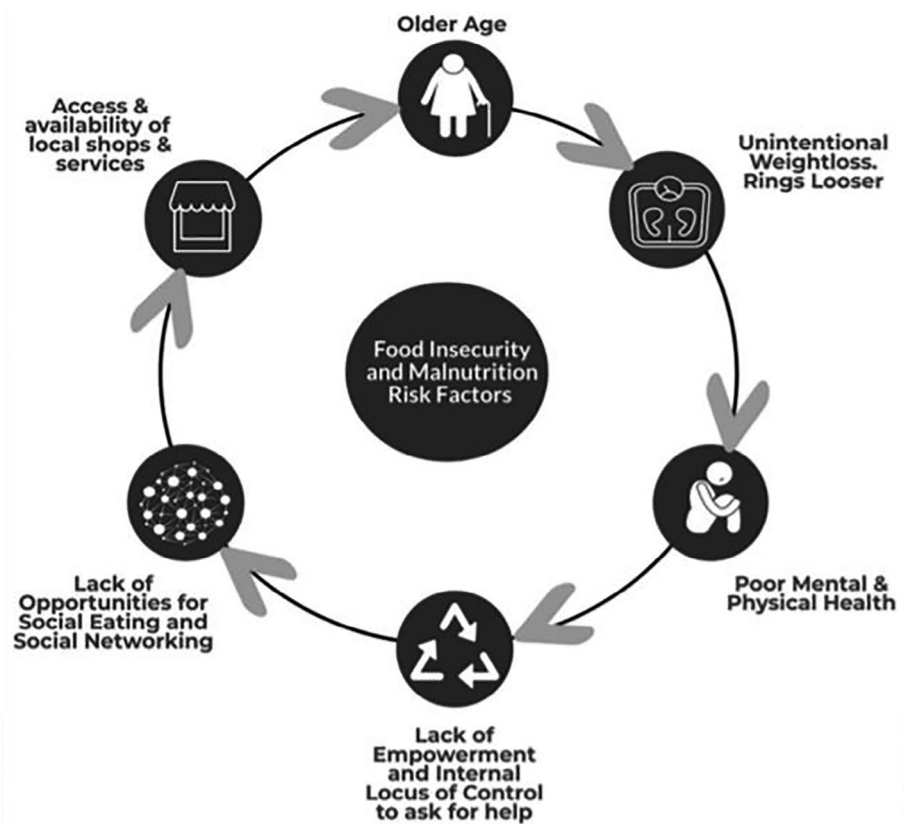


Figure 1. Cycle of risk for undernutrition and household food insecurity for older community dwelling older adults (Reid et al., 2020).

Calls to action – stakeholder engagement

To support the dissemination of the research findings and subsequent campaigning and advocacy work, four calls to action were developed. These calls for action were informed by this academic evidence combined with learning and experience from Food Train over 25 years and from project innovations and intelligence from the local community. The calls aimed to make a real and positive impact on the lives of older people, maximise food security and nutritional health and wellbeing, particularly for the most vulnerable.

Eat Well Age Well's four calls for action are:

1. Screening for malnutrition should be mandatory for all statutory agencies with a role in supporting older people.
2. Training on malnutrition, unintentional weight loss and health communication about household food insecurity should be embedded into basic training for all health and social care professionals.
3. More and better investment should be made in community initiatives that address social isolation in communities by providing befriending and opportunities for people to eat, shop or cook with others.
4. Food poverty and food insecurity are not the same for vulnerable older people. Policy, practice and research needs to take account for this (Eat Well Age Well, 2020).

These collaboratively developed calls to action have underpinned all subsequent written policy submissions, events and engagements and have the endorsement from key national organisations, who support awareness raising in their specific fields and demonstrate why a cross-cutting approach is vital to tackling the interconnected issues of malnutrition, food insecurity, social isolation and loneliness.

National Malnutrition Framework for Scotland

The Eat Well Age Well project has forged close working relationships with civil servants spanning across health and wellbeing, older people, social care and with MSPs and Scottish Ministers. This positioning has helped to inform policy calls to action, using learning and evidence and as well as the views and experiences of older people, including community [members.to](#) drive the policy landscape. A key achievement has been Eat Well Age Well's successful policy influencing. Notably a Motion in Scottish Parliament which led to the Scottish Government making a national commitment to plan for a Malnutrition Framework for Scotland:

Malnutrition (undernutrition) is wholly unacceptable and recognise that more needs to be done to better support access to healthy and nutritious food. We will remobilise our efforts, and I announce today that we will convene a short-life working group to develop a framework for the prevention of malnutrition and dehydration.
(Maree Todd, Public Health Minister, 27 October 2021) (Scottish Parliament, 2021)

Food Train and Eat Well Age Well are key strategic partners and our work has been used to shape and inform the development of this important policy development as it progresses.

Interconnected policy areas – Good Food Nation/Right to Food

Eat Well Age Well have also been active and influential in positioning malnutrition in the wider food, health and social care policy landscape and across multiple priorities including the Adult Social Care Review, National Care Service, Right to Food and the Good Food Nation Bill.

Section 7

In January 2022, Eat Well Age Well provided oral evidence on the Good Food Nation (Scotland) Bill to the Rural Affairs Island and Natural Environment Committee in Scottish Parliament. Our contribution enabled us to recommend that if Scotland is a place where all people experience 'pride and pleasure' from their food experience (as outlined by the Good Food Nation Plan) there must be significant shifts in recognising the wider importance of food for health and wellbeing in a growing ageing population. With key considerations given to recognise secure and dignified access to food as part of quality provision of social care. As Eat Well Age Well is embedded within Food Train, the voices and personal stories of older people were central to this evidence (Scottish Parliament, 2022).

Eat Well Age Well work collaboratively with organisations across the food system as part of the Scottish Food Coalition (2022) to tackle both individual and systemic vulnerabilities to both malnutrition and food security, there must be a wider interconnected systematic approach that tackles interconnected food and health system issues. For instance, how this is connected to the central role of the third sector and job precarity in that sector. Working together brings siloed policy areas into an interconnected approach and demonstrates how this area of change is beneficial to the whole food system. Eat Well Age Well have been influential in putting forward the case for the integration of the Right to Food into Scots Law and adoption of a right-based approach in the forthcoming Good Food Nation (Scotland) Bill, where everyone in Scotland has reliable access to nutritious, 'good quality, locally sourced and produced food is a practical everyday reality for everyone under the new legislation' (Scottish Government, 2021b).

Conclusions

Eat Well Age Well, is an innovative model, embedded within a national membership-based organisation, supporting older people, as well as working directly with community-based organisations, (including Food Train delivery branches) and collaboratively with National Bodies (including the Care Inspectorate), academia and local and national policy makers. This has resulted in malnutrition (as undernutrition) being recognised in Scottish Parliament and has led to a commitment of a short life working group on malnutrition. Success of this work is also evident in Scottish Government's commitment to fund Phase 2 of the Eat Well Age Well Project, thus recognising the importance of this issue and the crucial leadership of the project on this issue. In relation to policy change, this approach has ensured the direct lived experience of older Scots remains central to the policy discourse and recognises the ongoing challenges to this landscape, for instance the continued impact of the Covid-19 pandemic on not only individual's physical access to food, but the wider impact of physical and mental health and wellbeing. The collaborative approach of Eat Well Age Well working across sectors, including in partnership with the University of Glasgow, has ensured academic research and lived experience can directly influence policy change in Scotland. Thus, ensuring preventative approaches to public health and food policy work to mitigate both individual and systemic vulnerabilities, both now and as part of preparedness to develop resilient systems for potential future shocks. Eat Well Age Well recognise work to reduce vulnerabilities must be ongoing and continue to voice the importance of food for wellbeing, to support healthy ageing for those living at home, as well as recognising the vital work of the third sector to support and advocate for vulnerable members of the community.

References

- Age UK (2020) Rising risk of malnutrition among older people during lock down. Available from <https://www.ageuk.org.uk/latest-press/articles/2020/05/sounding-the-alarm-about-the-rising-risk-of-malnutrition-among-older-people-during-lock-down/#:~:text=Dramatic%20increases%20in%20isolation%20and,and%20the%20Malnutrition%20Task%20Force>.
- Bapen (2022) Introduction to Malnutrition. British Association for Parental and Enteral Nutrition Advisory Group. Available at <https://www.bapen.org.uk/malnutrition-undernutrition/introduction-to-malnutrition?showall=1>.

- Brown H, Reid K (2021) Navigating Infodemics, Unlocking Social Capital and Maintaining Food Security during the COVID-19 First Wave in the UK: Older Adults' Experiences. *International Journal of Environmental Research Public Health*. July 6;18(14):7220.
- Carruthers M *et al.* (2020) COVID-19 and Food Train – more food security, kindness and dedication to vulnerable older people at home. *Policy Scotland*, 6 May 2020. Available at <https://policyscotland.gla.ac.uk/covid-19-and-food-train-more-food-security-kindness-and-dedication-to-vulnerable-older-people-at-home>.
- Community Food and Health Scotland (2015) Malnutrition Summit 2015. Available at <https://www.communityfoodandhealth.org.uk/wp-content/uploads/2015/11/malnutrition-summit-report.pdf>.
- Douglas *et al.* (2020) Mitigating the wider effects of covid-19 pandemic response. *British Medical Journal*. 369: 1557. Available at <https://www.bmj.com/content/369/bmj.m1557>.
- Eat Well Age Well. (2020). 4 Calls to Action from Eat Well Age Well. Available: <https://www.eatwellagewell.org.uk/images/4%20Calls%20to%20Action%20from%20Eat%20Well%20Age%20Well%20FINAL.pdf>.
- Eat Well Age Well. (2022a) About Malnutrition. Available at <https://eatwellagewell.org.uk/malnutrition>.
- Eat Well Age Well. (2022b). Policy Influencing. Available at <https://www.eatwellagewell.org.uk/policy-influencing>.
- National Records of Scotland (2019) Projected Population of Scotland 2018. Available from <https://www.nrscotland.gov.uk/files//statistics/population-projections/2018-based/pop-proj-2018-scot-nat-pub.pdf>.
- Reid, K *et al.* (2020) Exploring Household Food Security and Malnutrition Risk with Psychosocial Indicators of Healthy Ageing in Place: The Food Train – Eat Well Age Well Partnership Project. In press. Available from <https://doi.org/10.31235/osf.io/6fwm8>.
- Scottish Food Coalition. (2022). About Us. Available: <https://www.foodcoalition.scot/>.
- The Scotsman (2020) Action Needed to Tackle Malnutrition Among Elderly. Available from <https://www.scotsman.com/health/action-needed-to-tackle-malnutrition-elderly-2992264>.
- The Scottish Government (2021a) A Scotland for the future: opportunities and challenges of Scotland's ageing population. Available from <https://www.gov.scot/publications/scotland-future-opportunities-challenges-scotlands-changing-population/pages/6/>.
- The Scottish Government (2021b) Good Food Nation Bill Introduced. Available from <https://www.gov.scot/news/good-food-nation-bill-introduced/>.
- The Scottish Parliament (2021) Meeting of the Parliament (Hybrid) 26 October 2021. Available from <https://www.parliament.scot/chamber-and-committees/official-report/what-was-said-in-parliament/meeting-of-parliament-26-10-2021?meeting=13367&iob=121270>.
- The Scottish Parliament (2022). Rural Affairs, Islands and Natural Environment Committee. Available <https://www.scottishparliament.tv/meeting/rural-affairs-islands-and-natural-environment-committee-january-26-2022>.
- Third Force News (2020) Charity calls for step change to tackle malnutrition among older Scots. Available from https://tfn.scot/news/charity-calls-for-step-change-to-tackle-malnutrition-amongst-older-scots?utm_campaign=Oktopost-2020-09+General+Campaign&utm_content=Oktopost-twitter-&utm_medium=social&utm_source=twitter.
- UK Malnutrition Awareness and Prevention Network (MAPN) (2020). MAPN Letter. Available from <https://eatwellagewell.org.uk/images/MAPN%20letter.pdf>.

Section 8.

Food for the future: innovative technologies

62. Climate change, agriculture, and genome editing

A. Bachmann* and A. Willemsen

Federal Ethics Committee on Non-Human Biotechnology, c/o Federal Office for the Environment, 3003 Bern, Switzerland¹⁷; andreas.bachmann@bafu.admin.ch

Abstract

A controversial issue regarding the adaptation of agriculture to climate change concerns the question of what role genome editing should play in the field of plant breeding. Intensive discussions are currently taking place at the European level whether the New Genomic Techniques (NGT), directed mutagenesis and cisgenesis in particular, should be regulated more liberally than conventional transgenic genetic engineering. This seems to be based, among other things, on the expectation that genome editing can be used to better manage the necessary adaptation to climate change, also in view of the fact that plant-based nutrition is to play a much greater role in the future. From an ethical point of view, two reservations can be raised against this assessment. When discussing these reservations, it should be borne in mind that the adaptation of agricultural crop production to climate change is urgent and should be done in line with the mitigation of greenhouse gases, especially methane and nitrous oxide, over the next ten to twenty years. Firstly, given the volatility of cultivation conditions and the associated demands for successful adaptation – which is not only about better protection against pests, but also about increased drought and heat and, at the same time, more frequent heavy precipitation – it is questionable whether NGT will be able to make a significant contribution to the development of crops adapted to the challenges of climate change in the given tight timeframe. Assigning them such a role nevertheless is to make a bet on the future that cannot be ethically justified in view of the urgency of the adaptation needs and the potential damage that could occur if the adaptation fails to succeed. This means, secondly, avoiding path dependencies as far as possible. Ethically, NGT are to play at best a minor role, provided their risks are acceptable and provided that they actually contribute to adaptation and do not impede or foreclose alternative adaptation approaches.

Keywords: climate change, agriculture, adaptation, food security, technology assessment, genome editing, New Genomic Techniques (NGT)

Introductory remarks

Based on scientific data, research is drawing damage scenarios of massive proportions associated with climate change (IPCC, 2022): The polar ice is melting; sea levels are rising and threatening coasts and islands. The sea is warming, the acidity of the sea is increasing, and marine biodiversity-rich habitats such as coral reefs are being lost. On the one hand, extreme weather phenomena such as heat waves and droughts, accompanied by forest fires, hurricanes and storm surges, are occurring more frequently and with greater intensity. On the other hand, heavy rainfall and floods increase and with them the probability of landslides when the soil can no longer hold the water masses. Fertile land is lost and crop yields are subject to strong fluctuations and decline in the long term. The number of species is decreasing and biodiversity is impaired. All this poses a fundamental threat to humans, animals and the environment.

At the global level, the growing world population and changing diets in increasingly affluent populations of large emerging economies such as China, Brazil and India are leading to large-scale deforestation or

¹⁷ The authors represent their own opinion.

Section 7

slash-and-burn to make way for agricultural land. These clearings release further CO₂ that was stored in the forest areas. This development increases the pressure on land use in addition to the already existing pressure due to dietary habits in industrialized countries. In order to meet the challenges of climate change with regard to agriculture, there are basically two complementary approaches. On the one hand, mitigation measures should be taken to reduce GHG emissions from agriculture. On the other hand, adaptation measures should enable agricultural processes to be adapted to the changing climate conditions (e.g. Kortetmäki, 2021).

A controversial issue regarding the adaptation of agriculture to climate change concerns the question of what role genome editing should play in the field of plant breeding. Intensive discussions are currently taking place on this issue at the European level concerning the question of whether the New Genomic Techniques (NGT), in particular directed mutagenesis and cisgenesis, should be regulated more liberally than conventional transgenic genetic engineering. This seems to be based, among other things, on the expectation that genome editing can be used to better manage the necessary adaptation to climate change – also in view of the fact that plant-based nutrition is to play a much greater role in the future (European Commission, 2021). In the following, we would like to put forward two reservations that can be raised against this assessment from an ethical point of view. Firstly, it is questionable whether the NGT can fulfil the relatively high expectations placed in them in the short time available. In view of the potential damage that could arise if this adaptation is not successful, they should accordingly only be given a minor role. This implies, secondly, that a corresponding path dependency should also be avoided.

Normative status of the 1.5 degree and the net zero target

From the point of view of precaution, achieving the 1.5 degree and the net zero target is a moral duty, despite all the uncertainties, especially regarding what would happen if they are missed. The possible damage scenarios of climatic changes caused by anthropogenic GHG emissions drawn by research pose existential threats to humans, animals and the environment. In view of the possible extent of damage, the probability of occurrence must be reduced as far as possible. Even if the damage is very unevenly distributed and does not threaten all of humanity equally, and even if the probability of occurrence of these damage scenarios were uncertain or low, they must be prevented.

In order to achieve the targets of 1.5 degree and net zero by 2050, GHG emissions must be massively reduced globally in the next 20 to 30 years (mitigation). Certainly, energy-intensive sectors such as housing, transport or industrial processes need to reduce more emissions than agriculture or the food system. Nevertheless, the share of agriculture is considerable. In Switzerland, for example, the agricultural sector currently emits around 14% of the GHGs that are accounted for in Switzerland under the Paris Agreement (Langfristige Klimastrategie der Schweiz, 2021:27). This does not change, even if the emissions consist mainly of methane and nitrous oxide and not primarily of CO₂ produced by fossil fuels.

This requires, among other things, a considerable reduction in the number of livestock, ruminants primarily because of methane emissions. (The life span of methane in the atmosphere is much shorter than that of CO₂, but accounts for a substantial part of man-made GHG effects, since the gas is 25 times more effective than CO₂.) Furthermore, grassland suitable for arable farming should be used to grow plant foods for human consumption. The number of pigs and poultry should be reduced because their feed competes with human food, increasing the need for arable land: instead of food that can be consumed by humans, feed is grown for the animals. The area required for their production must decrease. This is for climate reasons – CO₂ release through large-scale deforestation – and for reasons of biodiversity protection.

Adaptation and food security

The main objective of adaptation from an ethical point of view is to ensure food security, which is at risk due to global warming. According to the Food and Agriculture Organization of the United Nations (FAO), food security means that all people 'at all times have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and preferences for an active and healthy life' (FAO, Rome Declaration on World Food Security, 1996).

From an ethical point of view, what nutrition must be guaranteed to all people? What does everyone have a morally justified claim to in this respect? Ensuring freedom from hunger is an undisputed goal. In the following, however, we assume that this is not sufficient. The 'ethical minimum' must include more. Where to draw the line would require an in-depth discussion, which cannot be held here. A hint in the right direction is the FAO's statement that not only basic dietary needs, but also dietary 'preferences for an active and healthy life' should be satisfied. In addition, cultural values that have an influence on the type of diet should also be taken into account.

A change to more plant-based food plus greater nutritional needs with an increasing world population mean that crop yields must increase (and, in addition, the regional or local distribution of food must function adequately). In any case, we must avoid a global decline in crop yields. However, this danger exists if temperatures increase as expected – even if the distribution of risk or damage is likely to be unequal: Agriculture in already dry areas will tend to suffer even more, while some agriculture areas in the North might be able to adapt more easily to changed climate conditions. It must be taken into account, however, that an average increase of temperature does not mean stable climate, but rather an increased volatility of the climate with all its challenges for agriculture.

Moreover, it should be accepted that some people in developing countries can only adequately satisfy their basic nutritional needs through the consumption of meat, fish or dairy products. Under this condition, they have a justified claim to this kind of nutrition. Even in the rich industrialized countries, meat consumption may remain justifiable with regard to climate change, provided that only as many animals are used as can be fed with the area of grassland available domestically at any given time. However, in the sense of the net zero goal, this presupposes that negative emission technologies are developed that are able to completely or at least largely compensate for the methane that continues to be produced.

The moral duty to take the necessary measures

If reaching a goal is a moral duty, then this also applies to the measures that are appropriate or necessary to achieve the goal: they must be taken. If the 1.5 degree target is a moral obligation from an ethical point of view and thus ought to be achieved, and if for this purpose, among other things, GHG emissions in agriculture must be massively reduced, this implies a shift to a more plant-based diet. All the more, however, it must then be ensured that this plant-based supply can be globally guaranteed in the face of climate change in accordance with the concept of food security. This requires appropriate adaptation measures due to the changes of climatic conditions.

What adaptation measures need to be taken to achieve the goal of global food security under climate change conditions? Adaptation measures affect the entire agricultural production processes, from breeding and selection of livestock and crops, to improvements in soil management to maintain soil fertility and water use in the face of scarcer and more volatile water resources, to adaptations to new pests and diseases and the processing of products.

Section 7

If crops are to be adapted to the new climatic conditions, then the question arises as to which instruments can best be used to achieve this goal in a sustainable way. From an ethical point of view, the duty to achieve the goal is transferred to the duty to use the instruments necessary to achieve it. At this level, however, empirical questions play a decisive role. If one says, for example, that one such instrument are NGT, then this statement must be understood against the background of these ethical considerations. But then questions necessarily arise such as: What are the chances of sufficiently developing crops based on this technology within the given time frame? What role should it play as one among several instruments with regard to the goal to be achieved? In this respect, this technology assessment is of central importance for the ethical argument. There is no contradiction between ethics and technology assessment. Rather, technology assessment is an element of the ethical argument. Thus, ethics must engage with the empirical aspects of these technologies.

Technology assessment of NGT

In order to meet the challenges of climate change in terms of adaptation in agriculture, among other things, new genetic engineering methods are being brought into play as part of a solution. The main argument for the alleged superiority of NGT compared to conventional breeding technologies is the following: Conventional breeding methods are also working on the climatic adaptation of crops. Naturally occurring genetic variations with the desired characteristics are sought. In conventional breeding, this is for several reasons a time-consuming process. Several breeding cycles are necessary to achieve the desired genetic recombination. In contrast, new genetic engineering techniques, such as CRISPR, allow multiple simultaneous changes within the genome, which may be impossible with conventional methods. This accelerates research and breeding. The new methods should therefore, the argument continues, be integrated into existing breeding strategies, particularly in view of the urgency of adaptation measures, in order to produce more quickly crops that are more tolerant to climatic challenges and more resistant to pests: 'Scientists largely agree that molecular breeding techniques will make an important contribution in the coming years to making agriculture more productive, less pesticide-intensive and more climate-adapted through traits such as drought and heat tolerance.' (Leopoldina, 2019:24) This argument is linked to the expectation that yield losses due to climate change could be avoided or yields even be increased, thus contributing to food security.

The limited role of NGT in adapting agricultural crop production to climate change

Whether this expectation is justified, however, is questionable. Even if NGT are able to shorten the breeding time considerably, the fundamental problem remains that a plant variety has to cope with increasingly volatile climatic conditions. This problem cannot be solved by equipping plants with single trait changes, e.g. with drought resistance. It is the volatility of the climate that is decisive. This means, for instance, that crops must not only be able to react to drought but also to heavy precipitation during the same season. This increases the complexity of the environment even more to which crops have to respond. With this in mind, NGT may be able to shorten the breeding process for altering specific traits. However, they probably cannot meet the expectations regarding their contribution to these core challenges of climate change within the required time frame. (Hüdig *et al.*, 2022)

In view of the rapid climatic changes, the time period in which the agricultural areas are shifting geographically and the urgency to shift to a more plant-based diet, adaptation to ensure food security is urgent and imperative. NGT have developed plants with single altered traits containing biotic resistances or altered nutritional and agronomic properties. While they have been established under laboratory or green house conditions, there is very little data available on their behaviour in the field and the environment. Furthermore, there are hardly any examples of NGT plants with complex

traits such as abiotic stress tolerances. Considering this and the narrow time frame placing too high expectations on these NGT should be avoided. Even more so, if this leads to path dependency. The risk of path dependencies is that one adheres to an established process ('path') even if it later turns out that an alternative would have been superior. Path-dependent processes imply the risk of not being self-correcting, but rather prevent errors from being corrected. Such path dependencies should be avoided and, therefore, alternative research and breeding approaches must neither be neglected nor prevented or foreclosed by one-sided investment in a specific technological approach.

Concluding remarks

If one understands the safeguarding of global food security in the sense explained above as a moral duty – and there are good consequentialist as well as deontological arguments in favour of this position – then the question arises as to how this goal can be achieved in a sustainable manner under the conditions of climate change. Ethically speaking, if a goal is a duty, this also transfers to the means of achieving the goal: the means must be chosen that are best able to do so – as long as they fulfil certain other criteria, such as not being associated with unacceptable risks for third parties. Now, as far as adapting crop-based agriculture to climate change is concerned, holding high expectations regarding NGT seems to be unreasonable. We should avoid this path dependency because the probability of not reaching the target of food security appears to be too high. Technologies such as NGT may well be used in this context, provided that their risks are acceptable and that they do not block other approaches. Even then, however, they would only be one part of a broader approach that seems more able to cope with climatic volatility.

References

- European Commission (2021). Study on the status of new genomic techniques under Union law and in light of the Court of Justice ruling in Case C-528/16. https://ec.europa.eu/food/system/files/2021-04/gmo_mod-bio_ngt_eu-study.pdf.
- FAO, Rome Declaration on World Food Security (1996). <https://www.fao.org/3/w3613e/w3613e00.htm>.
- Hüdig, M., Laibach, N., Hein, A.-C. (2022). Genome Editing in Crop Plant Research. Alignment of Expectations and Current Developments. *Plants* 11(2), 212. doi.org/10.3390/plants11020212.
- IPCC Climate Change (2022). Impacts, Adaptation and Vulnerability. Working Group II contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_FinalDraft_FullReport.pdf.
- Kortetmäki T. (2021). Agriculture and Climate Change. Ethical Considerations, Bern.
- Langfristige Klimastrategie der Schweiz (2021). <https://www.news.admin.ch/newsd/message/attachments/65874.pdf>.
- Leopoldina (2019). Towards a scientifically justified, differentiated regulation of genome edited plants in the EU. Joint statement of Leopoldina – Nationale Akademie der Wissenschaften, Deutsche Forschungsgemeinschaft and Union der deutschen Akademien der Wissenschaften.

63. Technological mediation of empathetic human-animal relations through gene editing technologies

L. Borgdorff*, F.L.B. Meijboom and K. Kramer

Utrecht University, Faculty of Veterinary Medicine, Centre for Sustainable Animal Stewardship, Yalelaan 2, 3584 CM Utrecht, The Netherlands; l.borgdorff@uu.nl

Abstract

With the rise of genome editing, several possibilities to efficiently alter so-called farm animals arose which also gave room to ethical concerns. This paper aims to contribute to broadening the ethical debate revolving around such technologies by combining care ethics and postphenomenology. Care ethics highlights the importance of empathy in moral decisions and investigates mechanisms of bypassing and overriding empathy. Meanwhile, postphenomenology can explain how technologies can shape humans' perception of the world including nonhuman animals and thereby their capacity to empathise. In this paper we investigate to what extent gene editing technologies mediate breeders' and geneticists' perception of nonhuman animals.

Keywords: postphenomenology, care ethics, mediation theory, gene editing

Introduction

Gene editing technologies are of special interest for breeders of nonhuman animals. In particular, the clustered regularly interspaced palindromic repeats (CRISPR) and the CRISPR-associated protein 9 (Cas9) enable changes in genotype as well as in phenotype easily and (cost)-efficiently. Several breeding goals could be achieved using such technology. Fostering muscle and fat growth in pigs enhances efficiency in terms of meat yield (Qian *et al.*, 2015). Animal welfare can be improved by making animals more resistant to certain diseases like porcine reproductive and respiratory syndrome (PRRS) in pigs (Reiner, 2016) or certain environmental conditions like heat (Davis *et al.*, 2017). The former can also contribute to a reduction of antibiotics in agriculture (Reiner, 2016). Moreover, certain painful procedures like the castration of piglets or dehorning cattle can be made redundant by breeding animals without the characteristics that are currently removed manually (Schuster *et al.*, 2020).

Such technologies do not only have the potential to respond to existing ethical issues, but also raise concerns, some of which we aim to address in this paper through the lens of care ethics and postphenomenology. Care ethics highlights the importance of empathy as a guide to moral action and critically investigates mechanisms of bypassing or overriding empathy. Based on postphenomenology, we argue that technologies are no neutral tools but shape our perception and thereby play a role in fostering or inhibiting empathy. Finally, we apply the combination of both approaches to the case of gene editing.

Care ethics and the role of emotions and empathy

Traditional ethical theories endorsed by animal ethicists like Singer and Regan rely on the assumption that emotions are an unreliable guide to action and therefore need to be tamed by reason. Feminist care ethicists criticised them for distancing from emotions and thereby maintaining the patriarchal distinction between feminine emotions and masculine reason (Donovan, 1990; Luke, 1995). However, in reality, emotions play a crucial role in moral decision making (Haidt, 2001). As Josephine Donovan (1990, p.353) points out, even ethicists like Regan, who distance themselves from emotions, apply the

term 'counterintuitive' to reject certain arguments when logical reason fails to do its jobs. Also in practice, farmers dislike harmful practices like dehorning cattle (Sandøe *et al.*, 2019). This shows that it is not the emotional side preventing them from causing harm but that other factors override the empathy and distress felt when dehorning cattle. Moreover, Brian Luke argues that the livestock industry manages to sustain itself by preventing people from feeling empathy (Luke, 1995, pp.313-322). In particular, he presents three mechanisms which could explain the current situation in industrial farming of nonhuman animals.

First, Luke identifies a denial of responsibility. While consumers of animal products could claim that changing consumption behaviour does not make a difference in production conditions, farmers refer to the existing demand for animal products (Luke, 1995, p.314). Similarly, breeders could argue that they only fulfil the farmers' demand and are not responsible for how farmers treat their animals. Second, there is the denial of harm. When talking about nonhuman animals in agriculture, the language shifts away from any harm done. As Luke (1995, p.316) points out, 'animals are not killed or slaughtered, they are 'processed' or 'packed'; nor are they butchered, they are 'dressed' or 'disassembled'. One could add that the euphemism of 'animal welfare issues' used to describe serious harms similarly inhibits emotional responses. Besides language, there are strong cultural influences like advertisements or educational materials at school, which suggest that nonhuman animals live under the best possible conditions (Luke, 1995, p.316; Robbins, 1987, pp. 127-128). Even further, in some advertisements, anthropomorphised nonhuman animals happily promote organic meat (Leitsberger *et al.*, 2016). Finally, Luke argues that the nonhuman animal's subjectivity is denied by regarding them as machines (Luke, 1995, p.319). This can best be seen in the material conditions of factory farming which make nonhuman animals behave in a way that humans regard them as machines in a factory (Harfeld *et al.*, 2016).

Based on these different forms of denial, we want to introduce a distinction between bypassing and overriding empathy. Bypassing empathy refers to processes in which no connection between the moral agent and a potential recipient of empathy is established. This is the case when buying meat, in which there is a dissociation between the consumer and the nonhuman animal. In such cases, an empathetic relation can be re-established by recreating the connection between the consumer and the nonhuman animal, which is why restoring such a connection decreases meat consumption (Kunst and Hohle, 2016). With overriding empathy, we refer to processes in which there is a connection between an agent and a patient harmed by the agent. Usually, this happens over time when repeating the harm done in practices like slaughter, dehorning, or vivisection (Luke, 1995, p.317; Arluke, 1990). Here, the empathetic intuition of the agent is overridden by possible rationalizations and re-establishing the connection between the agent and the nonhuman animal patient is impossible as there never was a disconnect.

An aspect that is neglected in Luke's analysis is the role of technologies. Instead, Luke refers to the industry or the economic system as agents causing the previously described denials (Luke, 1995, p.315). Technologies thus seem to function as mere instruments serving the industry's aims. A proper philosophy of technology can fill this gap to a certain degree. In the following section, we introduce postphenomenology, which argues against such an instrumental definition of technology. The scope of postphenomenology can address the emerging question concerning the degree to which gene editing technologies might mediate empathetic relations between human and nonhuman animals.

Postphenomenology and mediation theory

Postphenomenology is a philosophy of technology based on Heidegger's phenomenological approach. In his essay 'The question concerning technology', Martin Heidegger rejects instrumentalism, thus, the idea that technologies are neutral tools. Instead, he argues that modern technology shapes us by revealing our environment as 'standing reserve' (Heidegger, 1954), thus, as a stock of resources ready for exploitation

and reduced to its utility. By regarding technology instrumentally, we ignore how technology reveals our environment. Finally, we become ourselves part of this 'standing reserve' as we come to adhere to the needs arising from this sort of revealing. In the case of gene editing technologies, such a view on technology seems reasonable as (gene editing) technology appears to reveal nonhuman animals as 'standing reserve' serving human purposes. Humans do not only regard them as 'standing reserve' but even modify them to create a 'standing reserve' that can be exploited more efficiently as exemplified by the large number of authors highlighting the benefits of gene editing in terms of performance such as meat yield (De Graeff *et al.*, p.4). The word 'performance', which neatly fits into the language of 'processed', 'packed', or 'disassembled' animals that Luke identifies as denying harm done to animals, simultaneously resembles machines or factories, thus, a technological setting. The Heideggerian thought can even be found in animal welfare improvements such as breeding hornless cattle. Here, farmers do not need to painfully remove the horns anymore to prevent them from hurting farmers if they decide not to cooperate or other cows if they do not have enough space. The idea that cattle's horns are problematic and need to be removed can only appear in a context in which cows are approached, to a significant extent, as means to human ends. Furthermore, farmers themselves heavily dislike dehorning cattle just because it causes them severe pain (Sandøe *et al.*, 2019). The fact that they still do so shows that they became 'standing reserve' to a certain degree as they engage in a task that they would not execute if there was not the demand for it, which also indicates that the farmers' capacity to empathise is present but overridden.

Simultaneously, Heidegger's approach faces several objections, especially concerning his essentialism, which means that he ascribes one essence to all technologies. For Don Ihde 'such an analysis was *useless*, since it could not discriminate between the results of playing a musical instrument, also a technological mediation, and the process of genetic manipulation!' (Ihde, 2006, p.271). Ihde's postphenomenology overcame this essentialism by distinguishing between different human-technology relations. While acknowledging that technologies are not merely tools, Ihde also claims that technologies are multistable. This means that the same technology can function and mediate human-world relations differently depending on the social context (Verbeek, 2001, p.134). Furthermore, Ihde differentiates between micro- and macroperception. While the former refers to sensual perception, such as seeing or hearing, the latter is rather cultural or hermeneutical. These concepts are closely related to each other which can be illustrated with the verb 'to see'. One can see a tree in a sensual sense, but one can also see a tree as piece of art. According to Ihde, there are three different types of human-technology interactions, which are the relation of mediation, alterity relations and background relations.

First, the relation of mediation can be subdivided into embodiment and hermeneutical relations. Embodiment refers to technologies through which the human perceives the world directly, such as contact lenses or glasses. This type of mediation requires technical accessibility, certain skills, and comparability between the mediated perception and the unmediated perception. In hermeneutic relations, technologies provide a non-neutral representation of the world, which still needs to be interpreted. An example of this could be an MRI scan at the hospital. One can regard embodiment and hermeneutic relations as two ends of the same scale. In embodiment relations, the world is almost perceived isomorphic, thus, as in unmediated interactions. Instead, in hermeneutic relations, the world is represented differently from the unmediated one and needs to be interpreted. Second, there are alterity relations, in which humans interact with technologies as 'quasi-other' (Verbeek, 2001, p.131). In these relations, the technology appears as rather independent from the human and as something calling for interaction. Meanwhile, the world becomes invisible. Possible examples for alterity relations could be human interactions with music boxes or ATMs. Finally, there are background relations in which the technology is part of the world, but only barely recognised by humans. However, our perception of the world changes through the means of these relations. Examples could be the sound of a refrigerator or minor temperature changes caused by a central heating device.

Postphenomenology serves as one of the descriptive foundations for Verbeek's mediation theory, which states that technologies and the way they mediate our relation to the world should be the object of ethical scrutiny and be considered when designing new technologies (Verbeek, 2015, p.31). From an ethical perspective, the relation of mediation is particularly interesting because of the 'structure of amplification and reduction' (Verbeek, 2001, p.128). This means that through mediation, technologies highlight and disclose different aspects of reality. In embodiment relations, this effect is rather weak because the user perceives the world as isomorphic, but it becomes stronger the more hermeneutic the human-technology relation is. Also, in alterity relations, the technology as quasi-other is amplified in the foreground while the outer world is reduced in the background. From the perspective of care ethics, this type of mediation is of particular importance as an amplification and reduction of certain characteristics of other sentient beings might impact humans' capacity to empathise. The interesting question is to what extent a structure of amplification and reduction is present in gene editing technologies that thereby affect the relation between human and nonhuman animals.

Postphenomenology and care ethics of gene editing

Breeders or geneticists interacting with gene editing technologies aim to understand nonhuman animals in terms of their (epi)genetic characteristics. Thus, they interpret a genetic representation of nonhuman animals indicating a hermeneutic relation. Simultaneously, when interacting with the technology as quasi-other, there is an alterity relation, which makes it distinct from automated sensing technologies. Both relations imply a structure of amplification and reduction. In this setting, characteristics that can be 'improved' by gene editing like milk, egg, and meat yield or certain desired phenotypes are amplified. Simultaneously, especially, when operating the technology, the nonhuman animal themselves and their eye movement, facial expression, and tone of voice are reduced in the perception of breeders and geneticists through the technology. Those characteristics are important for being recognised as sentient subjects and recipients of empathy. It is more difficult to empathise with a set of genes displayed on a screen than with a nonhuman animal in the real world. Both what Luke identified as denial of harm and denial of subjectivity seem to take place. When interacting with a representation of a nonhuman animal, potential harms done to them are hidden and require less effort as an empathetic response does not take place. Furthermore, the nonhuman animals' subjectivity is reduced in human perception as they are not displayed as individual subjects. Rather, they are represented in terms of genetic properties based on clearly stated breeding goals potentially achieved by genome editing technologies. Thus, the human empathetic intuition is bypassed and the mediated microperception might influence the macroperception. From the perspective of care ethics, such a lack of empathy is morally problematic and has far-reaching implications.

First, it can explain some of the shortcomings of the current debate about gene editing. A debate primarily based on consequentialist arguments is susceptible to the blind spots of consequentialism like the bias towards visible issues. If gene editing reduces nonhuman animals' characteristics enabling empathy, their interests are systematically underrepresented. This can explain the minor role nonhuman animals play in the current debate (De Graeff *et al.*, 2019, p.9). Second, breeders have a mediated perspective on the nonhuman animals they are breeding. Bypassing their empathetic intuition might make them take the animal's needs less into account as the inhibition threshold to harm nonhuman animals might be artificially lowered. However, if breeders' empathetic intuitions were already overridden before interacting with genome editing technologies, disconnecting the relation between breeders and nonhuman animals might even be desirable. In this case, mechanisms contributing to overriding empathy and therewith potentially harmful behaviours towards nonhuman animals would no longer be habituated. A discontinuation of these processes might in turn help restore empathetic relations between breeders and nonhuman animals. Finally, genome editing technologies are just a part of a huge network of farmers, breeders, technologies, and nonhuman animals. In this context,

Section 7

a trend of 'geneticisation' indicates the macroperception of life being understood in genetic terms (Holloway *et al.*, 2011). This in turn might influence which aspects of nonhuman animals are regarded in the microperception of nonhuman animals. The trend of geneticisation indicates an emphasis on classical breeding values like efficiency or quality, while empathy might be neglected. By being part of this development, genome editing technologies could also affect the perception of people not directly interacting with the technology such as farmers.

Conclusions

In this paper, we attempted to show that a combination of Ihde's postphenomenology and care ethics provides additional value to the current discussion on genome editing in so-called farm animals. While care ethics can add a normative perspective including the role of emotions and empathy to postphenomenology, postphenomenology can explain the role of technology in the mechanisms overriding or bypassing human empathy, which care ethicists identified. Hermeneutic and alterity relationships, in which gene editing technologies amplify certain characteristics of nonhuman animals but also reduce other aspects in human perception, are particularly relevant as a lack of empathy might result from such a reduction. Due to its shortness, this paper faces the limitation of having to accept several assumptions regarding the value of emotions and empathy. In particular, the idea of empathy as an innate human way of relating to the world requires phenomenological scrutiny. Also, socio-political aspects, which play a role in constituting technologies, power relations, and human attitudes were not properly addressed and deserve further examination, especially concerning rationalisations overriding empathy. Still, we think that we have shown that combining postphenomenology with care ethics can be a valuable contribution to the discussion of gene editing in nonhuman animals in a farming context. Postphenomenology offers the potential to explain how technologies shape our perception and might inhibit potentially empathetic relations to human and nonhuman animals. This insight sets a starting point for different kinds of future research. First, in line with Verbeek's mediation theory, efforts can be made to design technologies strengthening empathy by amplifying certain characteristics of nonhuman animals. This could be done in a participatory design approach to address the shortcoming of the current debate that the public is underrepresented (De Graeff *et al.*, 2019, pp.9-10). Second, the mediating effects of gene editing technologies regarding empathy could be investigated empirically by conducting interviews or questionnaires with breeders operating such technologies. Finally, the combination of care ethics and postphenomenology can also be applied to other technologies such as automated sensing technologies mediating farmers' perception of nonhuman animals.

References

- Arluke, A. (1990). Moral elevation in medical research. *Advances in medical sociology*, 1, 189-04.
- Davis, S.R., Spelman, R.J. and Littlejohn, M.D. (2017). Breeding And Genetics Symposium: Breeding heat tolerant dairy cattle: the case for introgression of the 'slick' prolactin receptor variant into *Bos taurus* dairy breeds. *Journal of Animal Science*, 95(4), 1788-1800.
- De Graeff, N., Jongsma, K.R., Johnston, J., Hartley, S. and Bredenoord, A.L. (2019). The ethics of genome editing in non-human animals: a systematic review of reasons reported in the academic literature. *Philosophical Transactions of the Royal Society B*, 374(1772), 20180106.
- Donovan, J. (1990). Animal rights and feminist theory. *Signs: Journal of Women in Culture and Society*, 15(2), 350-375.
- Haidt, J. (2001). The emotional dog and its rational tail: a social intuitionist approach to moral judgment. *Psychological review*, 108(4), 814-834.
- Harfeld, J.L., Cornou, C., Kornum, A. and Gjerris, M. (2016). Seeing the animal: on the ethical implications of de-animalization in intensive animal production systems. *Journal of Agricultural and Environmental Ethics*, 29(3), 407-423.

- Heidegger, M. (1954). The question concerning technology. In: Scharff, R. C. and Dusek, V. (Eds.). (2014). *Philosophy of technology: The technological condition: An anthology*, John Wiley and Sons, pp.563-584.
- Holloway, L., Morris, C., Gilna, B. and Gibbs, D. (2011). Choosing and rejecting cattle and sheep: changing discourses and practices of (de) selection in pedigree livestock breeding. *Agriculture and human values*, 28(4), 533-547.
- Leitsberger, M., Benz-Schwarzburg, J. and Grimm, H. (2016). A speaking piglet advertises beef: An ethical analysis on objectification and anthropomorphism. *Journal of Agricultural and Environmental Ethics*, 29(6), 1003-1019.
- Kunst, J.R. and Hohle, S.M. (2016). Meat eaters by dissociation: How we present, prepare and talk about meat increases willingness to eat meat by reducing empathy and disgust. *Appetite*, 105, 758-774.
- Luke, B. (1995). Taming ourselves or going feral? Toward a nonpatriarchal metaethic of animal liberation. *Animals and women: Feminist theoretical explorations*, 290-319.
- Qian, L., Tang, M., Yang, J., Wang, Q., Cai, C., Jiang, S., ... and Cui, W. (2015). Targeted mutations in myostatin by zinc-finger nucleases result in double-muscling phenotype in Meishan pigs. *Scientific reports*, 5(1), 1-13.
- Reiner, G. (2016). Genetic resistance-an alternative for controlling PRRS?. *Porcine Health Management*, 2(1), 1-11.
- Robbins, J. (1998). *Diet for a new America*. HJ Kramer.
- Sandøe P., M.A., Hyttel, P., Borchersen, S., Sørensen, L.P. and Palmer, C.P. (2019). Hornless cattle: Is gene editing the best solution? Talk at the workshop 'Gene Editing and Animal Welfare', 19 November 2019, University of Oxford. Available at: <https://youtu.be/XHMOqsYZpk>. Accessed 25 February 2022
- Schuster, F., Aldag, P., Frenzel, A., Hadele, K.G., Lucas-Hahn, A., Niemann, H. and Petersen, B. (2020). CRISPR/Cas12a mediated knock-in of the Polled Celtic variant to produce a polled genotype in dairy cattle. *Scientific reports*, 10(1), 1-9.
- Verbeek, P.P. (2001). Don Ihde: the technological lifeworld. *American philosophy of technology: The empirical turn*, 119-146.
- Verbeek, P.P. (2015). Cover story – beyond interaction: a short introduction to mediation theory. *interactions*, 22(3), 26-31.

64. Performing 'meat': meat replacement as drag

S. Efstathiou

Programme for Applied Ethics, Institute for Philosophy and Religious Studies, Norwegian University of Science and Technology NTNU, EC Dabls gate 12a, 7012 Trondheim, Norway; sophia.efstathiou@ntnu.no

Abstract

I propose that meat replacement is to meat, as drag is to gender. Meat replacement has the potential to shake concepts of meat, like drag does for gender. There is a rich literature on meat and gender. This paper also explores such connections but by analysing the concept of meat by analogy to that of gender: as an 'identity' that can be performed and performed otherwise. Meat replacements not only mimic meat but disclose how meat itself is performed in carnivorous culture – and show that it may be performed otherwise. My approach is inspired by the show *RuPaul's Drag Race*. The argument builds on an imitation of Judith Butler's work on gender performativity, performed by replacing 'drag/gender/sex/heterosexism' terms and relations in Butler's text with 'meat replacement/meat/species/carnism' ones.

Keywords: identity, gender, realness, performativity, RuPaul's Drag Race

Intro duction

I propose that meat replacement is to meat, as drag is to gender. Meat replacement practices and products have the potential to shake our concepts of meat like drag has done for gender. Consider the plant-based sausage Beyond Sausage, produced by the company Beyond Meat. With a caped super-cow as its logo, Beyond Meat claim:

We started with simple questions. Why do you need an animal to create meat? Why can't you build meat directly from plants? That's our company's mission. We hope our plant-based meats allow you and your family to eat more, not less, of the traditional dishes you love. Together, we can truly bring exciting change to the plate – and beyond.
GO BEYOND!
(Beyond Sausage product packaging)

Plant-based sausage, burger, nugget – these products exist; but plant-based *meat*? How can this not be a contradiction?

Products like Beyond Sausage are dubbed 'second-generation' plant-based meat replacements (He *et al.*, 2020). While first-generation replacements aimed to emulate the fibrous structure of meat, second-generation replacements go further to achieve meat's taste, odour and mouthfeel (e.g. melting fat), its appearance (e.g. whether the meat 'bleeds') and functionality (e.g. whether it changes from red to brown when cooked) (McClements *et al.*, 2021). Using sophisticated technology to replicate properties of animal-based meat, second-generation meat replacements are often mistaken for meat. This ambiguity of second-generation products also marks synthetic or cell-based laboratory meats. These meats provoke: for vegetarians they can seem too meat-like, and for meat-eaters unnatural or artificial (Varela *et al.*, 2022). The 'deviance' of these products contributes to shaking dominant concepts of meat (Mulhauser *et al.*, 2021) in some cases making 'normal' meat itself seem ambiguous (Van Der Weele and Driessen, 2019).

This paper explores how. It proposes that products like Beyond Sausage illustrate that vegetables can perform 'meat', achieve meat 'realness' and become (plant-based) meat. After briefly situating my work within existing literature, I explore how the ideas of performing meat and of achieving meat realness

were stimulated by the reality show *RuPaul's Drag Race*. I then build my argument by transfiguring or 'trans-phrasing' some of Judith Butler's writings on performativity, sex and gender: I substitute 'drag/gender/sex/heterosexism' terms and relations, in Butler for, respectively, 'meat-replacement/meat/species/carnivorism' ones. The derived text offers another imitation, a trans-text that argues that, like heterosexual identity, the ideal of a carnivorous identity is performatively constituted and could be performed otherwise: 'there is no 'proper' [meat], some [meat] proper to one [species] rather than another, which is in some sense that [species's] cultural property' (Butler, 1991, 21 [my text]). But first, allow me to situate this work within existing research on gender and meat culture.

Meat and gender

There is a rich body of work on gender norms and meat culture. Social science research reports that meat attitudes and consumption patterns differ significantly across self-identified men and women (Kalof *et al.*, 1999, Bugge and Alfnes, 2018, Kubberød *et al.*, 2002). Further, experiments exploring 'the meat paradox' – an aversion to harming animals that many meat-eaters have (Loughnan *et al.*, 2010) – also report gender differences. Highlighting meat's animal origin seems to affect women negatively towards eating meat, while reinforcing self-identified men's choice to eat meat (Dowsett *et al.*, 2018). Meat work is also gendered, with butchering primarily done by men who may find meaning in such difficult work through ideals of 'self-sacrifice' (Simpson, 2014). Finally, sexuality has been linked to meat preferences in the phenomenon of 'vegan sexuality' when vegans choose to date other vegans (Potts and Parry, 2010). Carol Adams argues that meat-eating is a way of 'doing' gender (Connell, 1995): within heteronormative, patriarchal cultures women's and animals' bodies become 'absent referents' that get collectivised, objectified and sexualised – at times interchangeably so (Adams, 1990, 2010; Fiddes, 2004). Jacques Derrida's concept of *carnophallogocentrism* goes further to claim that eating other animals (*carne-*), the primacy given to reason, or rationalisation (*logos-*) and phallogocratic ideals all overlap and mark current Western dominant subjectivities (Adams and Calarco, 2016).

Connections between carnivorism and heterosexist culture are rife with interest. But they run orthogonal to my focus here which is the transgression of such norms. Food practices are socially and historically constituted, and they change (Warde, 2016). I propose that meat – like gender – can be performed but also troubled, and that meat replacement products and practices emulate gender-troubling practices found in drag. This idea, that the arrangement and signification of gender's relation to sex can be interestingly thought of as analogous to the relationship between meat and particular animal or vegetable bodies (or laboratory creations of them) came to me while watching – or rather binging – *RuPaul's Drag Race*.

Gender trouble and meat trouble

In the winter of 2021, in the middle of a COVID pandemic and while recovering from a – thankfully 'kind' – case of breast cancer, there was nothing more joyful to me than watching the reality show *RuPaul's Drag Race*. Structured in the form of a competition or 'race' the show selects 'drag queens' auditioning from all over the USA and its territories to compete for a cash prize of 100,000 USD through a set of challenges, ranging from creating costumes to performing comedy skits and lip-synching. The show is legitimately criticized on multiple grounds: for commodifying and mainstreaming practices of minoritised and oppressed groups (Heller, 2020), for reinforcing stereotypes about race and gender (Strings and Bui, 2013) and – like other reality shows – for inviting participants to fashion themselves into sellable commodities (Ouellette and Hay, 2008). Still, I found myself devouring episode after episode, season after season, only to realise that they were inspiring new research.

Section 7

Here they were a set of beautiful and creative -mostly- cis-gendered men who wanted to embody female anatomies and fashions, personas, and gestures. As a cis-gendered female, admittedly suffering from her own female-sexed anatomy (including breasts with a higher risk of cancer), it was affirmative to see a show that celebrated notions and bodies of women beyond the given. 'You want fleshy thighs like mine, and get them by cutting thigh pieces out of Styrofoam? Amazing! Power to us!' This attention to detail and to form-fitting, the liberation and provocation created, echoed for me the making, and specifically the 'faking' of meat.

Can we think of 'doing' meat or of 'performing' meat by analogy to how gender identity is performed? Can food be analysed as performing a meat identity while being 'really' a vegetable? In that case, what is meat, really? If we follow feminist thinking, the possibility of imitation, of approximating sensual, functional, symbolic or material properties of some original, signals a fluidity in the very idea of an 'original' itself. Indeed, I argue, meat replacements do not only mimic meat: they disclose how meat itself is performed in carnivorous culture – and show that it can be performed otherwise. The rest of the text argues for these theses with the help of Judith Butler's work. But perhaps a brief discussion on the concept of realness -as opposed to the real- is warranted first.

Realness and reality

'Realness' is a term commonly used in 'ballroom' culture: ballroom was a platform for competition created by queer people of colour in New York to counter the racist and exclusionist drag queen pageants of the 1960s and 1970s in the USA (Street, 2016). Realness, or how close one came to emulate or 'blend in' with dominant heterosexual culture was a key criterion for winning a ball trophy. For example, when competing in the category of 'executive realness', performers would be judged on how well they embodied a (usually white, straight) business executive – whether their choice of fashion, posture or walk, conveyed this reality.

The proposal that realness can be achieved makes an important contribution for projects aimed at remaking reality – and resisting it (Haslanger, 2012). The idea of realness opens up to an understanding of reality as possibly having (or lacking) a property: that of realness. Things, people or ideas marked as Y might pose or perform as X, or thus embody 'X realness'. Realness thus becomes an attribute that can be accomplished as opposed to had, and that can be exercised and performed differently according to context. Further, performing realness – in this case by drag – has the potential to change reality while – seemingly – reproducing it. This possibility for realness to upstage reality shows reality up as itself contingent: it 'outs' reality as a project and a process of constantly achieving and performing what is taken-to-be-real in majoritarian-enforced, or otherwise 'canonical', views of reality. And this also goes for meat.

Meat replacement as drag

Much like Judith Butler argues that sexual practices can 'destabilize gender' (Butler, 1999, xi), so I propose that food practices like meat replacement can destabilize meat. My argument is performed by imitating two texts of the feminist and queer scholar whose work has been crucial for shaping philosophical social constructionist thinking: the introduction to *Gender Trouble*, and her chapter on 'Imitation and Gender Insubordination' (Butler, 1999 and 1991 respectively). By reading these works of Butler while thinking about meat I produce a text that is a replica, but also new, inserting meat where it – maybe – should not be.

First, I argue that meat-replacement practices question the reality of meat. Plant-based meat seemingly 'lacks 'reality', and is taken to constitute an illusory appearance' (Butler, 1999, xxii). But then comes a

challenge to the reality of what we see. Trans-phrasing Butler, inserting ‘meat’ and ‘chemical’ in the place of ‘gender’ and ‘anatomical’ illustrates how the foundation of these assumptions can be questioned:

In such perceptions in which an ostensible reality is coupled with an unreality, we think we know what the reality is, and take the secondary appearance of [meat] to be mere artifice, play, falsehood, and illusion. But what is this sense of ‘[meat] reality’ that founds this perception in this way? Perhaps we think we know what the [chemical composition] of [the meat] is (sometimes we do not, and we certainly have not appreciated the variation that exists at the level of [chemical] description). ... Indeed, if we shift the example from [meat replacement] to [cultured meat] (transsexuality), then it is no longer possible to derive a judgment about stable [chemistry] from the [shapes and materials that articulate the meat]. ... The moment in which one’s staid and usual cultural perceptions fail, when one cannot with surety read the [meat] that one sees, is precisely the moment when one is no longer sure whether the body encountered is that of a [vegetable] or [an animal]. The vacillation between the categories itself constitutes the experience of the body in question.

When such categories come into question, the *reality* of [meat] is also put into crisis: it becomes unclear how to distinguish the real from the unreal. And this is the occasion in which we come to understand that what we take to be ‘real’, what we invoke as the naturalised knowledge of [meat] is, in fact, a changeable and revisable reality. At this point the sedimented and reified field of [meat] ‘reality’ is understood as one that might be made differently and, indeed, less violently (trans-phrased from Butler, 1999, xxii-xxiii [my terms], *emphasis* in original).

The possibility of a less violent meat reality is precisely what plant-based meats promise, by resisting killing animals for their flesh. As the reality of meat is challenged by replacements, judgements about how ‘weird’ or ‘artificial’ plant-based meats only evidence – and question – the dominance of meat-eating, or carnist ideology (Joy, 2020). Meat replacement practices show that carnivorousness is itself contingent on its own repetition, to the *effect* of its reality.

[Meat replacement] is not the putting on of a [meatness] that belongs properly to some other [species], i.e. an act of *expropriation*, or *appropriation* that assumes that [meat] is the rightful property of [animal bodies], that [‘beef’] belongs to [‘cow’], and [‘pork’] to [‘pig’]. There is no ‘proper’ [meat], a [meat] proper to one [species] rather than another, which is in some sense that [species’s] cultural property. Where that notion of the ‘proper’ operates, it is always and only *improperly* installed as the effect of a compulsory system. [Replacement] constitutes the mundane way in which [meatness] is appropriated, theatricalised, worn and done; it implies that all [meat-ing] is a kind of impersonation and approximation. If this is true, it seems, there is no original or primary [meat] that replacement imitates, but *meat* is a kind of imitation for which there is no original; in fact, it is a kind of imitation that produces the very notion of the original as an *effect* and consequence of the imitation itself. In other words, the naturalistic effects of [animal-based meats] are produced through imitative strategies; what they imitate is a phantasmatic ideal of [carnivorous] identity, one that is produced by the imitation as its effect. In this sense, the ‘reality’ of [carnivorous] identities is performatively constituted through an imitation that sets itself up as the origin and ground of all imitations. In other words, [carnism] is always in the process of imitating and approximating its own phantasmatic idealization of itself – *and failing* (trans-phrasing Butler, 1991, 21 [my terms], *emphasis* in original).

Section 7

Being a carnivore is thus seen as an identity relying on a consumption of 'proper' meat, that is iteratively performed to embody an idealisation of some 'proper' – perhaps presumed male, or virile or strong, if we follow Adams – meat-eater, and continuously failing to achieve that reality.

Liberation and liberalism

Perhaps a note of caution is warranted here. Writing about *Drag Race*, Meredith Heller argues that the term 'realness' has come to convey what she dubs 'neoliberal ideologies of authenticity' (2020). Instead of 'realness' defined in relation to -and holding visible- a dominant heterosexist culture, in *Drag Race* queens are prized for being 'really' themselves –true to their 'authentic' self. Heller claims that presuming that authenticity will be rewarded -despite structural and economic inequality- feeds into a neoliberal, 'American dream': 'the neoliberal ideology that publicly embracing one's identity differences is economically and culturally beneficial' (2016, 134).

One might note that the production of meat replacements may similarly feed into neoliberal politics. There is arguably reason to worry about the capitalist and ecomodernist politics of what Alexandra Sexton and colleagues dub 'Big Veganism' (Sexton *et al.*, 2022; Volden, 2022) as about the neoliberal politics of *RuPaul's Drag Race*. As markets for second-generation meat replacements grow and products and investments multiply, the potential for planetary resource depletion and degradation through monoculture farming, of injustice through exploitative labour and land politics and of the perpetuation of anthropocentric ideologies persists, despite an opportunity granted to some animals to escape their meat fates.

Conclusions

This paper has explored the phenomenon of meat replacement by analogy to drag. By replacing notions of gender and sex in the work of Judith Butler with ideas about meat/meatness and animal bodies, I offered an argument for thinking of how things become food (Roe, 2006), and in this case meat. I argued that this process of 'doing meat' involves the iterative performance of dominant carnivorous concepts and practices around meat. More broadly I argued that meat replacement practices and concepts have the potential to destabilize normative concepts of meat as animal-based, by analogy to how drag challenges heteronormative notions of gender. To trans-phrase J. Butler on lesbianism and how it questions heterosexual priority: 'the negative constructions of [plant-based meat] as a fake or a bad copy can be occupied and reworked to call into question the claims of [carnivorous] priority' (Butler, 1991, 17).

My aim in this paper was not to defend plant-based meat as an 'ideal' or better meat. Big Veganism and *RuPaul's Drag Race* can both be criticised for their politics. Still, as the present text offers, analysing meat replacement as a performance of meat 'realness' can destabilise carnist (Joy, 2020) readings of meat as exclusively animal-based. Perhaps in the end meat will return –to imitate – again, itself, not in its current animal-based concept but in some revision of its pre-1300s, middle English notion incarnation as *mete* 'food, nourishment, sustenance' (www.etymonline.com).

References

- Adams, C.J. (2015 [1990]). *The sexual politics of meat: A feminist-vegetarian critical theory*. Bloomsbury Publishing USA.
- Adams, C.J. (2010). Why feminist-vegan now?. *Feminism and Psychology* 20(3): 302-317.
- Adams, C.J. and Calarco, M. (2016). Derrida and The Sexual Politics of Meat. In Potts, A. (ed.) *Meat culture*. Brill, pp. 31-53.
- Bugge, A.B., Alfnes, F. (2018). Kjøttfrie spisevaner–hva tenker forbrukerne?. Oppdragsrapport nr. 14-2018, Oslo: Forbruksforskingsinstituttet SIFO. Available at: <https://oda.oslomet.no/oda-xmlui/handle/20.500.12199/5355>

- Butler, J. 1991. Imitation and Gender Insubordination. In Fuss, D. (ed.) *inside/out. Lesbian Theories, Gay Theories*. Routledge, London and New York, pp. 13-31.
- Butler, J. (1999 [1990]). *Gender Trouble: feminism and the subversion of identity*. Routledge.
- Connell, R.W. (1995). *Masculinities*. Polity, Cambridge MA.
- Fiddes, N. (2004). *Meat: A natural symbol*. Routledge.
- Haslanger, S. (2012). *Resisting reality: Social construction and social critique*. Oxford University Press.
- He, J., Evans, N.M., Liu, H. and Shao, S. (2020). A review of research on plant-based meat alternatives: Driving forces, history, manufacturing, and consumer attitudes. *Comprehensive Reviews in Food Science and Food Safety* 19(5): 2639-2656.
- Heller, M. (2020). RuPaul realness: the neoliberal resignification of ballroom discourse. *Social Semiotics* 30(1): 133-147.
- Joy, M. (2020 [2010]). *Why we love dogs, eat pigs, and wear cows: An introduction to carnism*. Red Wheel.
- Kalof, L., Dietz, T., Stern, P. C. and Guagnano, G.A. (1999). Social psychological and structural influences on vegetarian beliefs. *Rural Sociology* 64(3): 500-511.
- Kubberød, E., Ueland, Ø., Rodbotten, M., Westad, F. and Risvik, E. (2002). Gender specific preferences and attitudes towards meat. *Food Quality and Preference*, 13(5), 285-294.
- McClements, D.J. and Grossmann, L. (2021). A brief review of the science behind the design of healthy and sustainable plant-based foods. *NPJ science of food* 5(1): 1-10.
- Muhlhauser, P., Drews, M. and Reitz, R. (2021). Grilling Meataphors: Impossible™ Foods and Posthumanism in the Meat Aisle. *Humanities* 10: 49. <https://doi.org/10.3390/h10010049>
- Ouellette, L. and Hay, J. (2008). Makeover television, governmentality and the good citizen. *Continuum* 22(4): 471-484.
- Potts, A. and Parry, J. (2010). Vegan sexuality: Challenging heteronormative masculinity through meat-free sex. *Feminism and Psychology* 20(1): 53-72.
- Roe, E. J. (2006). Things becoming food and the embodied, material practices of an organic food consumer. *Sociologia Ruralis* 46(2): 104-121.
- Sexton, A.E., Garnett, T. and Lorimer, J. (2022). Vegan food geographies and the rise of Big Veganism. *Progress in Human Geography* 03091325211051021.
- Street, M. 2016. The Iconic Drag Queen Behind Frank Ocean's 'Endless'. *Vice*, August 19. Available at: https://www.vice.com/en_us/article/kwkwqy/the-lgbtq-icon-behindfrank-oceans-endless
- Strings, S. and Bui, L.T. (2014). 'She Is Not Acting, She Is' The conflict between gender and racial realness on RuPaul's Drag Race. *Feminist Media Studies* 14(5): 822-836.
- Van Der Weele, C. and Driessen, C. (2019). How normal meat becomes stranger as cultured meat becomes more normal; ambivalence and ambiguity below the surface of behavior. *Frontiers in Sustainable Food Systems* 3: 69.
- Varela, P., Arvisenet, G., Gonera, A., Myhrer, K.S., Fifi, V. and Valentin, D. (2022). Meat replacer? No thanks! The clash between naturalness and processing: An explorative study of the perception of plant-based foods. *Appetite* 169: 105793.
- Volden, J. (2022). Can we (de)grow meat? Bringing alternative protein in dialogue with degrowth. *Tvergastein*: 16. Available at: <https://www.tvergastein.com>
- Warde, A. (2016). *The practice of eating*. John Wiley and Sons.

65. Transforming food systems through genome editing – animal ethics and citizen engagement

A.I. Myhr^{1*}, S.G. Carson² and B.K. Myskja²

¹NORCE Norwegian Research Centre, SIVA Innovasjonssenter, 9294 Tromsø, Norway; ²NTNU – Norwegian University of Science and Technology, 7491 Trondheim, Norway; anmy@norce-research.no

Abstract

Genome editing holds a great potential for efficient plant and animal breeding. The first genome edited plants and animals have already enter the market, and if we believe even moderate predictions, the technology will transform our food production systems. To achieve responsible governance of genome editing, it is crucial to discuss how to include non-safety aspects in the assessment of these technologies. We also point out that since genome editing can be used in a broad range of organisms, from micro-organism to animals, there is a need to assess on a case-by-case basis both the risk issues and the ethical aspects for the specific organism to be genome edited. Here we mainly focus on the use of genome editing in animals and on how this technology may affect animal welfare and integrity. Genome editing of animals is generally neglected in current debates about how to achieve adequate regulation of genome editing. We draw on a modified version of Korsgaard's Kantian approach to animal ethics to indicate some crucial concerns for regulatory debates. In addition, we argue that implementation of the technology requires citizen engagement, which should not be limited to acceptance or no acceptance of the technology and should not only focuses on potential positive or negative effects on health and environment. We should aim for a broad discussion on how this technology can be used to transform our food systems, with the aim that a wide conception of animal welfare, as well as other safety and non-safety issues are included. Our analysis is relevant for the European debate on regulation of genome editing; in particular to what extent genome editing of animals can contribute to the transformation of food productions systems as pointed out in EU strategies, such as the Green Deal, Farm to Fork and Taxonomy for sustainable activities.

Keywords: CRISPR, animal welfare, citizens engagement, Farm to Fork, GMO

Introduction

Genome editing (GE) includes several techniques where CRISPR (clustered regulatory interspaced palindromic repeats) is the most known and used. Recent years have seen a rapid growth in research using GE (Blix *et al.*, 2021; Menchaca, 2021), and the first products are already on the market. Currently, three different GE fish species are approved for commercial production in Argentina and Japan, all edited for enhanced growth ('Japan embraces' 2021). Research is underway for developing sterile fish, as well as less aggressive fish. Argentina works on developing hornless cattle, initially using the genome editing technique TALEN, which is now on hold as researchers are exploring the use of CRISPR for developing a new line. There is also work on modifying cattle for handling heat more easily as well as an initiative for improving tenderness in meat. Concerning pigs there is research on increasing resistance to viruses and on doubling the number of muscles fibres. Already commercially approved GE animals and the ongoing research on GE animals may improve or decrease animal welfare as the approaches are broad and seek a variety of goals. However, the question of how to adapt present GMO and animal welfare regulation to adequately assess these introduced changes is scantily discussed, with the implication that the specific issues of GE of animals is largely neglected. In addition, research and development

initiatives using GE have exploded in quantity and research areas, leaving it almost impossible to keep track of what is happening for experts and regulatory authorities. As this is an advanced technology, science communicators, policymakers and citizens have been unable to follow the development. The general knowledge is inadequate, and there is little involvement of citizens in the discussions concerning adequate GE regulation.

Documents from different governmental agencies focus mainly on GM plants, and the scientific literature is, with few exceptions, dominated by discussions of regulatory and ethical issues connected to GE of plants. The same is the case for biotechnology-based articles and book chapters. Thus, the current debate suffers from two shortcomings: First, this narrow focus on GE plants leaves out important considerations connected to animal welfare and integrity. Second, the current debate is driven and dominated by experts in biotechnology, law, and ethics, despite wide acceptance among researchers and regulators that citizens engagement is required to ensure a responsible technology development.

We will in the following describe present regulatory approaches in Europe and point out that important ethical questions regarding our relations with animals remain underlit in the current policy debate. We employ Korsgaard's Kantian approach to animal ethics to indicate how to handle the ethics challenges.

As transformation of food systems is requested to meet challenges by an increasing population, climate change and degrading environments, we draw on European strategies towards food systems and argue that to meet these strategies citizen engagement is a key. If GE is to fulfil its predictions within these strategies, a refined ethical assessment procedure with broad involvement of stakeholders and citizens is needed.

Genome editing and regulatory processes

Regulation of GE is currently under discussion in many countries. Several jurisdictions, including the US, Argentina, Brazil, and Japan have exempted GE organisms without inserted novel genetic material from the targeted GMO (genetically modified organisms) regulation (Turnbull *et al.*, 2021). Others, notably the EU, have included them in GMO legislation. In 2018, the Court of Justice of the European Union decided that GE organisms fall under the legal definition of GMOs. In the aftermath, one report by the EC about the new genome techniques (European Commission, 2021a) and one Opinion from EGE on the Ethics of GE (European Commission, 2021b) has been issued, followed by a roadmap for a legislative initiative for plants produced by GE techniques (European Commission, 2021c). Only the report from EGE has discussed and pointed out that depending on the target organisms, different ethical issues may arise.

In Norway, the Biotechnology Advisory Board (2018) has published a suggestion for a level-based legislation. Their starting point was based on the smaller the change the lesser the risk, and when using examples, they focused on plants. In October 2021, the Norwegian Scientific Committee for Food and the Environment published a report where they discuss implications for risk assessment using GE, and their conclusion is that present regulatory frameworks can be used after small adaptations. However, their discussion rested on established risk assessment procedures established by the European Food Safety Authorities (EFSA), which have mainly been developed for GM plants. In 2020, a governmental expert committee on gene technology was appointed with a broad mandate, including to give suggestions for regulatory reform, followed by a public consultation process after submission. Given their broad mandate, it is assumed that their final report will point out directions for future regulation, and not consider specific actions points or challenges for the different use of GE (e.g. microorganisms, algae, plants, insects, and animals and event by event).

Section 7

While this regulatory debate has mainly concerned risk and safety assessment regimes for GMOs in general, many argue that ethical and social concerns of this technology justify a widening of the scope (Meijboom 2020, Harfouche *et al.*, 2021). The possibility for transformation of our food systems using GM and GE techniques legitimizes that non-safety factors are included in the assessments preceding approval processes for commercial use of products based on these technologies. However, the literature on non-safety issues usually focuses on GMOs or GE organisms in general; if they discuss specific applications, it is on plants. There is no systematic study of the regulatory challenges by GE of animals. Policy documents from different governmental agencies as well as academic literature are on plants. The latter includes biotechnology-based articles, those thematizing future possibilities as well as policy-oriented papers. This narrow focus may cause important aspects of GE in animals to be left out or given insufficient coverage in future regulatory frameworks. There is therefore a clear need for a systematic study of the current regulatory regimes of GE with respect to the adequacy of these existing or emerging frameworks for GE animals. This need for regulatory oversight of GE of animals has also been pointed out in a country that has no specific GMO regulation, by the US Food and Drug Administration (Solomon, 2020).

Admittedly, animals are protected through animal welfare laws, but this is not sufficient for the challenges raised by this disruptive technology. Although some of these laws, like the Norwegian Animal Welfare Act, may include issues of breeding with biotechnological methods, they are not updated with recent developments within GE. They are arguably better suited for welfare issues regarding existing animal varieties than possible future genetically altered species. Here it is of relevance to consider the moderate, but unforeseen welfare problems experienced by the cloned sheep Dolly, which showed that current welfare regulation is insufficient for dealing with the uncertain and unintended consequences of novel technological interventions. In addition, these laws do not include sustainability and societal concerns, further demonstrating that a specific regulation is needed also for GE of animals. GE of animals may have ethical aspects not readily covered by existing welfare laws.

Our obligations to other animals

One way to approach the ethical aspects of GE of animals is by reference to Christine Korsgaard (2018), as her theory captures key notions in the public debate on animal ethics, namely welfare and integrity. She argues that although human beings are the only kind of animals that are capable of moral responsibility through creating laws for themselves, it does not follow that we should be viewed as more important than other animals. Moreover that, since sentient animals are beings for whom something can be good or bad, it follows that we have a moral responsibility to treat them as ends in themselves and not simply as means to our ends. Still, their lack of reflexivity means that they are not ends in themselves in the full sense of being able to take moral responsibility.

This view has ethical implications, not just for how we may treat individual animals, but also for how our actions influence other species – or rather other animal communities – and their right to pursue their good. We should do the best we can towards other animals, and for Korsgaard this implies not eating them or experimenting on them. We suggest a modified interpretation of Korsgaard's argument, where painless killing after a good life may be acceptable. They are allowed to pursue their own good in a normal lifespan, and hence are treated as ends in themselves. As long-term plans and future expectations are not part of their good, marginally shortening animal lives is not to treat them as mere means. This means that the common practice in industrial farming of ending the lives of production animals at early stages, is unacceptable.

In her book 'Fellow Creatures: Our Obligation to the Other Animals' (2018), Korsgaard discusses using gene technology to put an end to predation by genetically altering predators in order to stop the suffering of other animals. The problem with such an approach is that we thereby would be imposing our concept of good, our morality, on other animal communities: 'Nature is recalcitrant to moral standards. We can impose the form of law on our actions, but we cannot impose the form of the good on nature. This is the source of some of the knottiest problems of animal ethics' (Korsgaard, 2018: 154). Korsgaard keeps the specificities of our obligations towards other animals, including our right to impose changes on their living conditions, quite open and tentative with a keen eye on paradoxes. However, she is clear on the point that we humans need other animals and that we therefore need to strive for conditions where we may live together in a way where we do not simply treat them as means to our ends. The non-utilitarian (Aristotelian) concept of good that forms the basis of her theory also suggests that avoiding suffering, which is often brought up as an argument in favour of certain uses of GM or GE of animals, cannot itself be seen as a sufficient argument. This is because pleasure and pain have no independent value; they 'are just the valences of conscious life's essential awareness of itself' (Korsgaard, 2018: 166). The primary issue is how the modification affects the animal's good, and its effect on suffering is one indication of how the animal is affected.

Our adjusted version of her approach implies no total ban on GE but indicates that the frames for acceptability cannot merely be animal welfare. We must respect the animals' own good and should refrain from altering characteristics that are parts of their species-specific good. This is admittedly vague, but it gives some guidance. For example, enhancing disease resistance may be acceptable. Diseases impede the functioning of all living beings; and removing the risk of diseases through vaccination is in most cases considered a good for humans and animals. Doing it through GE may be a better alternative in some cases. However, production animals are particularly susceptible to diseases due to their living conditions, and they must be improved before GE introduced resistance can be considered a good. Likewise, introducing characteristics already present in other varieties of the species may improve the good of some animals, for example the dehorning of cattle. This is a contested issue, but the argument can be made that this will promote their good beyond the mere reduction of risk of pain. However, speeding up growth and increasing muscle weight, as well as altering sensitivity to physical stimuli appear as contrary to respecting animals as ends in themselves, because they are merely done for production purposes.

Citizen engagement for a responsible governance of genome editing

Korsgaard's position suggests that we ought to consider other animals' right to pursue their own concept of the good before changing their living conditions through GE. However, other animals are not capable of evaluating the acceptability of such a change of living conditions – this remains up to humans. The starting point for such an evaluation should not be a narrow view on how GE may affect animal welfare, health, and environment. Bringing in the perspective from Korsgaard on how human beings and other species alike should be allowed to pursue their good suggests that we need to develop a broad knowledge base for responsible governance of GE in the agricultural and aquaculture sectors.

A common assumption in biotechnology science and industry is that citizen scepticism against GE is due to insufficient knowledge about how this technology works, known as the knowledge-deficit model. We adhere to the critique of the way the knowledge-deficit model fails to acknowledge that citizens' opinions about science and its applications are complex, situationally sensitive expressions of value systems (Shah *et al.*, 2021, Siipi and Atheensuu, 2011). Even if they lack full knowledge of the technology, people understand what is at stake and partake in the essential moral reflection in a way that makes their contribution a necessary complement to the approaches represented by experts, be they scientists, technologists, or ethicists.

Section 7

GE holds the power to transform food systems and through this transformation the technology may also deeply impact how we relate to other animals and their biological characteristics. It is vital that the regulation of this powerful technology is knowledge-based while also reflecting our moral values. Therefore, citizens should be engaged in the process towards regulation of these technologies, but such engagement should not primarily aim to check in the form of polling or evaluation whether the technologies are acceptable to the public. Rather, the goal should be to create a public discourse on how relevant public values should function as a guide for the development and regulation of GE (Carson *et al.*, 2021), in an integrated evaluation based on the fundamental moral principle that animals have a good of their own and should not be treated as mere means.

Transforming food systems

Global population growth creates demand for increased nutritional supplies and a shift to more sustainable food production. Strategies and frameworks for transformation of food systems have been generated, like the Farm to Fork strategy under the European Green Deal (European Commission, 2020), and the EUs taxonomy of sustainable activities. They are typically derived from or relate explicitly to the UN Sustainable Development Goals, that aim to achieve important human interests and do not specify any goals directed at the good of non-human animals (Torpman and Röcklinsberg, 2021). GE has been suggested as a key towards transforming food systems. Given that we have an obligation to take the good of non-human animals into account, it is necessary to integrate the specifics of the normative evaluation of GE animals into such strategies and frameworks.

To build a sustainable future that includes a wide range of approaches, including GE, we need a broader understanding of the challenges involved and the acceptability of the technological solutions. Despite awareness of a need for non-safety assessments of the disruptive GE technologies, the specific challenges by GE of animals are not handled adequately in the current regulatory systems and neither in the suggested strategies and frameworks. If GE is to fulfil its predictions within the strategies developed to reform our food systems, a refined ethical assessment procedure considering the good of animals with broad involvement of stakeholders and citizens is needed.

References

- Blix, T.B., Dalmo, R.A., Wargelius, A. and Myhr, A.I. (2021) 'Genome editing on finfish: Current status and implications for sustainability'. *Reviews in Aquaculture* 13: 2344-2363. <https://doi.org/10.1111/raq.12571>
- Carson, S. Myhr, A.I. and Myskja, B.K. (2021). Public engagement in biotechnology innovation – the need for research and the role of ethics. In Schübel, H. and Wallman-Helmer, I. (eds.) *Justice and food security in a changing climate*. Wageningen Academic Publishers, Wageningen, the Netherlands, pp. 301-306.
- European Commission (2020). Farm to Fork Strategy. Available at: https://ec.europa.eu/food/sites/food/files/safety/docs/f2f_action-plan_2020_strategy-info_en.pdf.
- European Commission (2021a). Study on the status of new genomic techniques under Union law and in light of the Court of Justice ruling in Case C-528/16. Available at: https://ec.europa.eu/food/sites/food/files/plant/docs/gmo_mod-bio_ngt_cu-study.pdf.
- European Commission (2021b). European Group on Ethics in Science and New Technologies. *Ethics of Genome Editing*. 2021. Available at: <https://op.europa.eu/en/web/eu-law-and-publications/publication-detail/-/publication/6d9879f7-8c55-11eb-b85c-01aa75ed71a1>.
- European Commission (2021c). Legislation for plants produced by certain new genomic techniques. Available at: https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/13119-Legislation-for-plants-produced-by-certain-new-genomic-techniques_en.

- Harfouche, A.L., Petousi, V., Meilan, R., Sweet, J., Twardowski, T. and Arie Altman, A. (2021). Promoting Ethically Responsible Use of Agricultural Biotechnology. *Trends in Plant Science*, 26 (6), 546-559. <https://doi.org/10.1016/j.tplants.2020.12.015>
- 'Japan embraces CRISPR-edited fish.' (2022). *Nature Biotechnology* 40 (10) <https://doi.org/10.1038/s41587-021-01197-8>
- Korsgaard, C.M. (2018). *Fellow Creatures: Our Obligations to the other Animals*. Oxford University Press, Oxford, UK, pp. 272.
- Meijboom, F. (2020). Food biotechnology: trust and trustworthiness. In J. Simon, J. (ed.) *The Routledge Handbook of Trust and Philosophy*. Routledge, Milton Park, UK, pp. 378-390.
- Menchaca, A (2021) Sustainable Food Production: The Contribution of Genome Editing in Livestock Sustainability 13, 12: 6788. <https://doi.org/10.3390/su13126788>
- Norwegian Biotechnology Advisory Board (2018). Forslag til oppmykning av regelverket for utsetting av genmodifiserte organismer. Available at: <https://www.bioteknologiradet.no/filarkiv/2018/12/2018-12-03-Komplett-genteknologiloven-Bioteknologiradet-til-web.pdf>.
- Shah, E, Ludwig, E. and Macnaghten, P. (2021). The complexity of the gene and the precision of CRISPR: What is the gene that is being edited? *Elementa: Science of the Anthropocene*, 9 (1). <https://doi.org/10.1525/elementa.2020.00072>
- Siiipi, H. and Atheensuu, M. (2011). The deficit model and the forgotten moral values. *Icelandic E-Journal on Nordic and Mediterranean Studies*. Available at: <https://nome.unak.is/wordpress/06-1/conference-paper/the-deficit-model-and-the-forgotten-moral-values/>.
- Solomon, S. M. (2020). Genome editing in animals: why FDA regulation matters. *Nature Biotechnology* 38: 142-143. <https://doi.org/10.1038/s41587-020-0413-7>
- Torpman, O. and Röcklinsberg, H. (2021). Reinterpreting the SDGs: Taking Animals into Direct Consideration. *Sustainability* 13, 2: 843. <https://doi.org/10.3390/su13020843>
- Turnbull, C., Lillemo, M. and Hvoslef-Eide, T.A. K. (2021). Global Regulation of Genetically Modified Crops Amid the Gene Edited Crop Boom – A Review. *Frontiers in Plant Science*, 24 Feb 2021. <https://doi.org/10.3389/fpls.2021.630396>
- Norwegian Scientific Committee for Food and Environment (2021). Genome editing in food and feed production – implications for risk assessment. Available at: <https://vkm.no/download/18.10afeec517cb7b2af6388ada/1635753509892/Use%20of%20genome%20editing%20in%20food%20and%20feed%20production-abbreviated,%20web.pdf>.

66. Natural and sustainable – cellular agriculture’s normative uncertainty

J. Rijssenbeek*, Z. Robaey and V. Blok

Philosophy Group, Wageningen University and Research, Hollandseweg 1, 6706 KN Wageningen, the Netherlands; julia.rijssenbeek@wur.nl

Abstract

With synthetic biology, agricultural commodities can be produced using cell cultures or host microorganisms, rather than farmed animals or crops. This is called cellular agriculture. The research question of this paper is: How does cellular agriculture affect key values such as sustainability and naturalness? The technique is projected to offer a way to ‘sustainably’ produce food with the help of ‘natural’ processes. As there is a lack of a normative discussion of the disruption posed by cellular agriculture, we discuss the deeper disruptive effect of this technology on key values of sustainability and naturalness. We analyse how cellular agriculture leads to different types of normative uncertainty about these two values, among others the normative uncertainty of how to prioritize among the values of sustainability and naturalness. We conclude that this inter-value conflict reflects the longstanding debate in agriculture between eco-modernists and ecologists.

Keywords: cellular agriculture, normative uncertainty, sustainability, naturalness

Introduction

It is important to understand what the effect of cellular agriculture is on sustainability and naturalness, because: (1) the main promises about cellular agriculture are that its products are natural and more sustainable than traditional or conventional counterparts; (2) sustainability and naturalness are key values in the debate on the future of food and agriculture; (3) the two concepts are identified by other scholarship as pressured by industrial biotechnology (Asveld *et al.*, 2019); and (4) sustainability and naturalness are deeply engrained in our thinking and defining for the way we evaluate technologies and their potential to benefit society (if solutions are natural and sustainable, we tend to find them desirable). Some examples of cellular agriculture have already entered society, but the technology is not yet present in *optima forma*, resulting in normative uncertainty about the two values.

Taebi *et al.*, 2020 conceptualize normative uncertainties as situations where there are different partially morally defensible but incompatible options or courses of action, or ones in which there is no fully morally defensible option. They distinguish between: (1) conceptual normative uncertainties (e.g. concepts/values could be interpreted differently); (2) evolutionary normative uncertainty (e.g. technology could render an earlier identified norm irrelevant, or it could add a new (not yet known) norm to the discussion); and (3) inter-value conflicts (normative uncertainty about how to prioritize among values). We show how this inter-value conflict reflects the longstanding debate in agriculture between eco-modernists and ecologists.

Sustainability

Sustainability is a main promise of cellular agriculture. Companies in the field make statements about how the technology will improve environmental outcomes (e.g. reduce emissions) and thus be more environmentally sustainable in contrast to conventional agriculture. But what does sustainability mean?

Conceptual normative uncertainty: There are different interpretations of the value of sustainability. It is noted that there has been little scholarship examining the relationship between synthetic biology and sustainability and that this is complicated by the multiple, competing interpretations of sustainability (Karabin *et al.*, 2021). Referring to 'thick' and 'thin' definitions of sustainability (Vos, 2007), Karabin *et al.* (2021) analysed the interpretations of sustainability of synthetic biology companies and concluded that among these companies a thin notion of sustainability prevails. This thin notion stands for achieving sustainability through resource management and product substitution, most often pointing to specific types of environmental gains (e.g. reduction of emissions, reduction of land or water use). They contrast it with a thick notion that in this context stands for change in societal consumption or policy frameworks required in order to see sustainability gains.

Evolutionary normative uncertainty: Cellular agriculture leads to new norms of sustainability, as the technology could challenge our ideas of existing norms on sustainable food production and products.

Naturalness

Proveg International, a non-governmental organization dedicated to reducing global animal consumption, writes: 'Humans have been producing cultured foods for thousands of years, including alcohol, cheese, and numerous traditional foods. Cellular agriculture products would be just as natural as these products' (2020). The quote reflects naturalness as the second major promise of cellular agriculture. Companies in the field are promoting their products as 'natural' or as produced through 'natural processes' (Guthman and Biltekoff, 2020), as consumers are concerned about the naturalness of products grown in a laboratory (Moritz *et al.*, 2022). If products are perceived as unnatural, this can lead consumers to not accept cell ag products (Weinrich *et al.*, 2020). But because the technology 'models processes of life' and production is no longer 'limited by nature' it is questioned whether this label of natural is applicable. The normative uncertainty about naturalness in cellular agriculture is thus visible in discussions concerning labelling. The complexity and ambiguity that is inherent to the term 'natural' (Sandin, 2017) is further brought to the fore by the disruption that cellular agriculture brings about.

Conceptual normative uncertainty: Equally to the discussion of sustainability, we also distinguish between a thick and a thin notion of naturalness. The thick notion is based on the thought that naturalness in is placed in opposite to human disruption, on the separation of our cultural and technological selves from the natural (van Haperen *et al.*, 2012). The thin notion of naturalness circumvents this more fundamental discussion on the notion of naturalness. On the base of this notion, proponents of cellular agriculture maintain that in contrast to chemical production methods, producing food with the help of engineered micro-organisms is a natural process and cellular agriculture products can thus be seen as natural, not in the least because they are chemically closer or even identical to natural products.

Evolutionary normative uncertainty: It might be the case that the norm on what is perceived as 'natural' always moves due to increased technological interference or increased technological mediation of our life world. What used to be conventional farming is now considered natural in comparison to cellular agriculture, while conventional farming today has also been technologically disruptive in comparison to the agricultural methods before the Green Revolution. As such, cellular agriculture could thus simply lead to new norms around naturalness.

Inter-value conflict between naturalness and sustainability

What is the link between naturalness and sustainability? In biotechnology, the issue of sustainability is closely linked to that of naturalness (Asveld *et al.*, 2019). If new technologies like cellular agriculture aim at reaching sustainability (value 1), but are perceived as unnatural (value 2), an inter-value conflict

Section 7

emerges (between value 1 and 2). This value conflict that arises from cellular agriculture causes conceptual normative uncertainty: Which value is more important in the context of this disruption? Which value is going to be prioritized?

This inter-value conflict reflects the longstanding debate in agriculture between eco-modernists and ecologists. To illustrate this, consider a recent article by the popular environmental environmentalist George Monbiot where he ascribes to the promises of cellular agriculture (Monbiot, 2020). This article was conceived as his turn to eco-modernism. The two visions – eco-modernism and (deep) ecology – differ in what they consider natural and how to reach sustainability.

Eco-modernist might argue that technological interference in some natural phenomena and processes (e.g. the unnaturalness of cellular agriculture) is warranted as cellular agriculture has great environmental potential, using less land, water, energy, resources, and resulting in fewer emissions. This reflects the vision of sustainability as promoted in the eco-modernist manifesto: 'to us the city and the minimum amount of farmland necessary to support it, to the rest of creation the wilderness' (Smaje, 2015).

In contrast, (dee) ecologists, in agriculture represented by agroecologists, William Vogt and the Club of Rome, find it questionable whether creating or introducing new or 'unnatural' (genetically modified) organisms and their products into the environment can be accepted as a means to reach sustainable food and agriculture. In contrast to cellular agriculture, the traditional or 'natural' value chain is attuned to the local ecology and more sustainable (Asveld *et al.*, 2019). In analogy to the GMO debate, in the public opinion, many believe genetic modification is artificial (Vogel, 2009). As soon as things are artificial, i.e. highly processed or highly industrialized i.e. if natural processes are highly disrupted, ecologists doubt that it can be sustainable. Cellular agriculture is thus considered inherently unsustainable. In this, naturalness is placed in opposition to human disruption. In that perspective, cellular agriculture can be seen as next frontier of eco-modernist dream (Van der Weele, 2021).

In terms of the ontology of nature, the difference in definitions of sustainability is how much of naturalness is valued intrinsically. However, we should not be too quick to conclude that cellular agriculture belongs to the eco-modernist pole of the debate. In an attempt to 'save' cellular agriculture products like cultured meat from ecomodernism', Van der Weele (2019) proposes to counter the dichotomous thinking of eco-modernist vs ecologically sustainable by building scenarios to envision cellular agriculture production through a local and small-scale industry.

Conclusions

In this short paper, we have discussed the normative dimension of disruption of cellular agriculture, by showing how the disruption of cellular agriculture leads to normative uncertainty about sustainability and naturalness. We have analysed how different conceptualisations of the two values are at stake in the discussion of cellular agriculture. Finally, we concluded how the emerging the inter-value conflict between the two values in cellular agriculture reflects the longstanding debate in agriculture between eco-modernists and ecologists.

References

- Asveld, L., Osseweijer, P. and Posada, J.A. (2019). Societal and ethical issues in industrial biotechnology. *Sustainability and Life Cycle Assessment in Industrial Biotechnology*, 121-141.
- Guthman, J. and Bilteckoff, C. (2020). Magical disruption? Alternative protein and the promise of de-materialization. *Environment and Planning E: Nature and Space*, 2514848620963125.

- Karabin, J., Mansfield, I. and Frow, E.K. (2021). Exploring presentations of sustainability by US synthetic biology companies. *Plos one*, 16(9), e0257327.
- Monbiot, G. (2020, January 8). Lab-grown food will soon destroy farming – and save the planet. *The Guardian*. <https://www.theguardian.com/commentisfree/2020/jan/08/lab-grown-food-destroy-farming-save-planet>
- Everything you need to know about cellular agriculture (2020, August 25). *Proveg International*. <https://proveg.com/blog/everything-you-need-to-know-about-cellular-agriculture/>
- Sandin, P. (2017). How to label 'natural' foods: A matter of complexity. *Food ethics*, 1(2), 97-107.
- Smaje, C. (2015, August 12). Dark thoughts on ecomodernism. *Dark Mountain*. <https://dark-mountain.net/dark-thoughts-on-ecomodernism-2/>
- Taebi, B., Kwakkel, J.H. and Kermisch, C. (2020). Governing climate risks in the face of normative uncertainties. *Wiley Interdisciplinary Reviews: Climate Change*, 11(5), e666.
- Van Der Weele, C. and Driessen, C. (2019). How normal meat becomes stranger as cultured meat becomes more normal; Ambivalence and ambiguity below the surface of behavior. *Frontiers in Sustainable Food Systems*, 3, 69.
- Van Der Weele, C. (2021). How to save cultured meat from ecomodernism? Selective attention and the art of dealing with ambivalence. In *Animals in Our Midst: The Challenges of Co-existing with Animals in the Anthropocene* (pp. 545-557). Springer, Cham.
- Van Haperen, P.V., Gremmen, B. and Jacobs, J. (2012). Reconstruction of the ethical debate on naturalness in discussions about plant-biotechnology. *Journal of Agricultural and Environmental Ethics*, 25(6), 797-812.
- Vogel, B. (2009). Smart breeding: Marker-assisted selection: A non-invasive biotechnology alternative to genetic engineering of plant varieties. In N.T. Steve Erwood (Ed.), *Greenpeace*.
- Vos, R.O. (2007). Defining sustainability: a conceptual orientation. *Journal of Chemical Technology & Biotechnology: International Research in Process, Environmental & Clean Technology*, 82(4), 334-339.
- Weinrich, R., Strack, M. and Neugebauer, F. (2020). Consumer acceptance of cultured meat in Germany. *Meat science*, 162, 107924.

67. The ethics and politics of cultured meat: food transition, big business, 'humanewashing'

C. Salzani^{1*} and Z. Weisberg²

¹Messerli Research Institute, Ethics and Human-Animal Studies, Veterinaerplatz 1, 1210 Vienna, Austria;

²Independent scholar, Rua de Ferreira Cardoso 53, n. 1, 4300-198 Porto, Portugal; carlo.salzani@vetmeduni.ac.at

Abstract

Cultured meat is increasingly being touted by animal industry players and leading animal advocates alike as a viable alternative to flesh from slaughtered animals. At first glance, cultured meat, which is made from stem cells collected from ostensibly harmless biopsies of living animals and grown in vats, seems like a logical and even ingenious solution to the otherwise seemingly insurmountable problem of balancing the growing global demand for animal flesh with urgent concerns surrounding the massive environmental and animal welfare costs intrinsic to industrial animal food production. Unfortunately, however, upon closer examination it quickly becomes clear that this optimism is unfounded: cultured meat is far from a panacea to the ills inherent to animal agriculture. In fact, by working hand-in-hand with some of the biggest food corporations and meat producers to develop and promote cultured meat, and by shifting focus away from the development of sustainable plant-based alternatives to animal protein, the cultured meat project perpetuates those very ills.

Keywords: animal protein, alternatives to meat, environmental costs of meat, animal agriculture, humanewashing

Introduction

In December 2020, Singapore became the first country to approve the commercialisation of cultured chicken nuggets, which had recently been produced by the Californian food start up Eat Just. On 19 December 2020, the Singapore restaurant '1880' served its first batch to customers, who declared the nuggets indistinguishable in taste and texture from conventional meat (Scully, 2021). Cultured meat (also known as *in vitro*, cellular, synthetic, lab, and clean meat) is produced by *in vitro* cell cultures of animal cells: the cells are extracted from a dead or living animal through a biopsy and then immersed in a culture medium (carbohydrates, fats, proteins, salts, supplemented with additives) and placed inside a bioreactor where cell growth and specialization occur. Ideally, no animal needs to be slaughtered in the process. As a result, cultured meat is believed to offer a viable solution to the urgent animal welfare, environmental, human health, and food security concerns presented by intensive animal agriculture and the growing global population. The cultured meat project, which offers a 'promissory narrative' (Stephens, 2013) of technological redemption from the ills of animal agriculture, has been hailed as a major breakthrough both by the animal industry and animal advocates. We will argue, however, that this optimism is unwarranted. For a start, major players in animal agriculture use their investment in and support of cultured meat as a means of humanewashing and greenwashing their fundamentally inhumane and environmentally unsound practices. Moreover, recent research indicates that even if clean meat companies were to reach maximum projected levels of production, the project is inherently 'unscalable' and will never be as cost-effective as – and therefore will never replace – factory farming. Finally, the drive to continue producing and consuming 'real' meat (though artificially grown outside an animal body) perpetuates the tendencies which are at least partially to blame for leading the planet to the brink to begin with: the objectification of animals and the relations of domination that reduce animals to killable, edible, and infinitely replaceable objects.

The 'absurdity' of animal agriculture

The fantasy of producing meat without the 'annoyance' of an animal body has fuelled the imagination of science fiction since the late nineteenth century. But the idea of producing meat without animals has inspired visions of a technological fix for the problems of animal agriculture at least since Winston Churchill pontificated in 1931 that '[w]e shall escape the absurdity of growing a whole chicken in order to eat the breast or wing, by growing these parts separately under a suitable medium' (Churchill, 1931). Churchill optimistically thought that this could happen fifty years from his proclamation, or by the end of the twentieth century. His prediction was not far off. The rapid progress of biomedicine and tissue-engineering allowed American pathologist Russell Ross to cultivate muscular fibres *in vitro* as early as 1971 (Sebo, 2018). However, it was only in 2002 that the technology was available for scientists at Touro College in New York (funded by NASA with the aim of allowing astronauts to grow meat on spaceships) to produce a fish fillet made from goldfish cells (Benjaminson *et al.*, 2002; Stephens *et al.*, 2018).

These highly publicized technological advances created great expectations and enthusiastic support, so much so that in 2008 they spurred PETA to offer a \$1 million award to whomever succeeded in bringing cultured chicken meat to the market by 2012 (a deadline then extended to 2014). The Dutch government, among other institutional actors, started funding research on cultured meat, and in 2013 the first cultured beef burger was created by Dutch pharmacologist Mark Post and his team at Maastricht University. This burger, which took almost two years to produce and cost over \$300,000, was cooked on live television by a renowned chef and tested by renowned food critics on 5 August 2013 (Schaefer and Savulescu, 2014; Sebo, 2018). PETA's prize was never awarded because the costs and technological aspects remain challenging for commercialization, but, in comparison to Post's burger, Eat Just's chicken nuggets now take only 14 days to produce and cost \$17 (Scully, 2021).

Today, many companies and institutions are contributing research, funding, and other forms of support to the effort to 'escape the absurdity' of animal agriculture and produce cultured meat. Some prominent examples are New Harvest, which was founded in 2004 and is the longest running cellular agriculture-based organization; the Good Food Institute, created in 2016 with Bruce Friedrich (who worked for PETA for fifteen years) as the chief executive officer; and The Better Meat, created in 2018 by Paul Shapiro, an animal activist turned entrepreneur. Other organizations like Animal Equality, Proveg International, Mercy for Animals, and the Humane League have also declared their support for cultured meat, and international investors are pouring millions of dollars into the project. The panacea cultured meat is believed to present to the evils of animal agriculture has led some philosophers and ethicists to argue that we are 'morally required to support' what has been named 'carniculture' (Hopkins and Dacey, 2008). Cultured meat's list of supporters includes prominent animal rights scholar Peter Singer, who has said he would be pleased to try it once it becomes commercially available (Singer, 2013).

Revolutionizing animal agriculture

If fulfilled, the promise of 'meat's transcendence from animal life' (McHugh, 2010: 188) could ostensibly solve a number of pressing global problems that threaten the planet and human life itself: the suffering and death of billions of animals, the massive environmental costs of animal agriculture, global food shortages for a growing population, the inefficient use of our available resources, and the health risks associated with mass produced meat. With global meat consumption expected to double between 1999 and 2050 (Miller, 2012: 48; Rorheim *et al.*, 2016: 1), current meat production is unsustainable on a number of levels. Shifting to plant-based food systems on a global scale is considered by many to be unrealistic and utopian (e.g. Hopkins and Dacey, 2008; Rorheim *et al.*, 2016), while cultured meat is regarded as a more viable solution.

Section 7

It is very difficult to give precise estimations of the number of animals slaughtered for food every year (and this lack of specificity is itself an indicator of the magnitude of the problem), but the numbers provided by the FAO statistics exceed 80 billion. The environmental costs of animal agriculture are also massive: it consumes more land, water, and energy than most other industries, and it also emits more carbon dioxide, methane, and nitrous oxide than most other industries (the so-called 'carbon hoofprint'); overall, it is one of the biggest contributors to global climate change, biodiversity loss, freshwater scarcity, and ecosystem collapse. According to some estimates (which, it must be pointed out, at the current stage are only informed assumptions), cultured meat would require 99% lower land use and 82-96% lower water use and would emit 78-96% fewer greenhouse gases than animal agriculture. Energy requirements would be about 7% higher, but overall carniculture would be significantly more resource efficient (Tuomisto and Teixeira de Mattos, 2011; Rorheim *et al.*, 2016).

The advantages for human health would also be significant. The quantity and quality of fat and other substances could be monitored, controlled, and even genetically manipulated, which, in turn, could lead to the reduction of nutrition-related diseases such as obesity, cardiovascular diseases, type 2 diabetes, and various forms of cancers of the digestive system. Because antibiotics are not required in the production of cultured meat, it would not contribute to antibiotic resistance, a major threat to global health today, and the aseptic and strictly controlled environment required to produce it could drastically reduce the dangers of zoonotic diseases such as swine or avian flu, which are transmitted to humans by farmed animals and are another growing threat to human health (Rorheim *et al.*, 2016).

As noted above, these factors have led many philosophers and policy makers to state that developing and supporting cultured meat is not only a moral duty and obligation (e.g. Armaza-Armaza and Armaza-Galdos, 2010: 518; Hopkins and Dacey, 2008: 579), but also a practical necessity (Sebo, 2018: 164).

The persisting ills of animal agriculture

Regrettably, much of the philosophical discussion on cultured meat is devoid of genuine critical reflection. Instead, and perhaps as a deliberate avoidance mechanism, philosophical discussions tend to fixate on superficial issues such as the 'yuck factor' of new forms of 'Frankenfood' or the dangers of cannibalism it supposedly introduces (e.g. Hopkins and Dacey, 2008; Milburn, 2016). Any robust philosophical examination of cultured meat, however, shows that it is an ethically, socially, politically, economically, and environmentally misguided endeavour.

Promoters of cultured meat are keen to point out that extracting stem cell cultures (also known as 'starter cells') from live animals is relatively harmless inasmuch as the process is accomplished in a matter of minutes using a biopsy needle and local anaesthetic. They also stress that a cell culture from one animal of any given species 'would be theoretically enough to provide endless meat' (Rorheim *et al.*, 2016: 4), and that in the future, starter cells could be sourced from cell banks, obviating the need for live animals at all. However, even if the cells are taken 'harmlessly' from live animals, the production of a culture medium is, as proponents of cultured meat admit, a 'decidedly inhumane process': it requires slaughtering a pregnant cow and draining the blood from the heart of her unanesthetized calf to extract foetal bovine serum (FBS) (Rorheim *et al.*, 2016: 4-5; McHugh, 2010: 187f). Although cultured meat developers are working to derive alternative growth media from plants, fungi, and microalgae to replace FBS, it could be years before they are successful (McHugh, 2010: 187f).

FBS production points to a larger problem: far from posing a threat to the animal agriculture industry, the cultured meat industry is in direct partnership with it, and indeed, depends on it, and is for this, and other reasons, likely to contribute to its survival. For example, Shapiro's The Better Meat Co. teamed up with US agribusiness giant Perdue to create Chicken Plus®, chicken nuggets 'enhanced' with

chickpeas and cauliflower (Clean Meat Hoax, 2022); Upside Foods (formerly Memphis Meats), the first cultured meat company in the world, has also received investments from agribusiness behemoths, Tyson Foods and Cargill; and Israeli clean meat start up Future Meat has received investments from Tyson, while Supermeats, another Israeli start up, has been funded by PHW-Gruppe Lohmann & Co., a huge European poultry company. As Bruce Friedrich has candidly stated, the cultured meat project *needs* the meat industry: it needs their economies of scale, their global supply chain, their marketing expertise, and their massive consumer base (Friedrich, 2020). It is ironic, and even 'Orwellian,' that we are relying on '[t]he system we have to thank [...] for killing billions of animals each year, wrecking the ecology of the entire planet, and wiping out 60% of all wild animals on the earth in just the last 40 years to direct us towards a more ethically robust and environmentally sustainable future' (Clean Meat Hoax, 2022). The cultured meat project is not only a way for these companies to humanewash their image, but risks increasing the power large corporations, and the techno-capitalist apparatus as a whole, wield over the means of food production (Miller, 2012: 55).

Ultimately, cultured meat is doomed to fail because it is, by all accounts, an unscalable project. With astronomically high production costs, it will never be able to compete with animal agriculture, which is able to produce vast quantities of meat and other animal products at an increasingly low cost (both to producers and consumers). As Joe Fassler points out, '22 million pounds of cultured protein,' which is what CE Delft's techno-economic analysis (TEA) suggests Good Food Institute could produce in one year, is 'only about 0.0002, or one-fiftieth of 1%, of the 100 billion pounds of meat produced in the U.S. each year' (Fassler, 2021). Logistics also undermine scalability: according to an analysis by the trade publication Food Navigator, 'If cultured protein is going to be even 10% of the world's meat supply by 2030, we will need 4,000 factories like the one GFI envisions. To meet that deadline, building at a rate of one mega-facility a day would be too slow' (Fassler, 2021). Contamination of cells is also a major concern. It is a huge and expensive undertaking to create 'clean rooms,' which are necessary to ensure vats and production facilities are contaminant-free. Finally, while cultured meat production may require substantially less land and water use than its animal-based counterpart, it could have much higher energy requirements and so may not be as environmentally friendly as hitherto assumed (Rorheim *et al.*, 2016: 6).

The perpetuation of animal agriculture

The partnership between carniculture and animal agriculture goes beyond investment: it is an ideological partnership as well. Despite purporting to occupy the moral high ground, the carniculture industry perpetuates the notion that animal bodies are always already available for and destined towards instrumentalization, exploitation, and commodification. As Miller puts it, 'Carniculture may be read as a coherent continuation, perhaps even a culmination, of this logic of efficiency that represents a kind of ultimate capitalisation of animal bodies through the isolation of the value of animals from the animals themselves' (Miller, 2012: 50). Even if it were willing to cut ties with the animal agriculture industry and were able to produce cultured meat without killing animals, the carniculture industry would inevitably perpetuate harm against animals by reinforcing the widespread belief that meat is something 'normal, natural, and necessary,' the basis of the ideology Melanie Joy calls 'carnism' (Joy, 2010: 98). Cultured meat does not contest, but rather reproduces in the symbolic domain, the 'framework of intelligibility' that makes and maintains the idea of animals as edible, the linguistic, intellectual, epistemological, social, and economic conditions that make the slaughter of animals possible in the first place (Sinclair, 2016).

Increasingly, there is a conflation between plant-based meat substitutes and cultured meat, with some companies, such as the Good Food Institute, producing both. This indicates a blurring of the line between genuine alternatives to products made from animal flesh to those made from (new forms of) animal flesh. This conflation undercuts the hard work being done to promote ethically robust and

Section 7

ecologically sustainable plant-based foods (and ways of thinking about animals and food respectively). A related problem is that the cultured meat lobby perpetuates the ‘fetishization’ of protein – a tendency initiated by agribusiness in the first place – and the false notion that the best sources of protein are meat or cultured meat alternatives (as opposed to vegetables and legumes). For most supporters of cultured meat (e.g. Hopkins and Dacey, 2008; Friedrich, 2020), the moral argument against eating meat has proven ineffective and will continue to do so. Though veganism is also on the rise, its popularity cannot compete with the rapidly increasing demand for animal flesh around the world. However, the solution to this problem cannot be to embrace and promote further consumption of animal flesh, however it has been produced.

Far from challenging our current relationship of domination to nonhuman beings, the development of cultured meat plays into human hubris and the dangerous drive for exertion of total control over biological life. Cultured meat is the culmination of the process of human intervention into animal life that started with domestication, before progressing to genetic engineering and biotechnology. Today there is less and less tolerance for animals not conforming to our demands. Rather than moving us away from the tendency towards violence against animals, the development of cultured meat carries it forward. The cultured meat project is an integral part of the Promethean paradigm of total control and domination that promotes an instrumentalist approach to other species (Miller, 2012). Surely, for any substantive and lasting change to occur, we will have to abandon our fixation with meat altogether, and devote ourselves instead to developing a global, ecologically sustainable plant-based food system.

Cultured meat provides a quick (and illusory) technological fix to what is, in truth, a crisis of civilization. Rather than lead us towards a humbler relationship with nonhuman animals, rather than reconcile us with nature and our nonhuman kin whom we have violently dominated for centuries, cultured meat only alienates us from them further. If we rely on technology to (falsely) solve our problems now, we are likely to continue do so into the future and will never learn to make the meaningful change that is necessary for the survival of our and other species on this planet, a change that is based on honest, critical self-reflection and humility.

References

- Armaza-Armaza, J.A. and Armaza-Galdos, J. (2010). Legal and ethical challenges regarding edible *in vitro* meat production. In: Casabona, C. *et al.* (eds.). *Global food security: Ethical and legal challenges*. Wageningen Academic Publishers, Wageningen, pp. 513-520.
- Benjaminson, M.A. *et al.* (2002). *In vitro* edible muscle protein production system (MPPS): Stage 1, fish. *Acta Astronautica* 51(12): 879-889.
- Churchill, W. (1931). Fifty years hence. Available at: http://rolandanderson.se/Winston_Churchill/Fifty_Years_Hence.php.
- Clean Meat Hoax (2022). Available at: <https://www.cleanmeat-hoax.com>.
- Fassler, J. (2021). Lab-grown meat is supposed to be inevitable. The science tells a different story. *The Counter*. Available at: <https://thecounter.org/lab-grown-cultivated-meat-cost-at-scale/>.
- Friedrich, B. (2020). Creating a new agricultural revolution. *Effective Altruism*. Available at: <https://www.effectivealtruism.org/articles/bruce-friedrich-creating-a-new-agricultural-revolution>.
- Hopkins, P.D. and Dacey, A. (2008). Vegetarian meat: Could technology save animals and satisfy meat eaters? *Journal of Agricultural and Environmental Ethics* 21(6): 579-596.
- Joy, M. (2010). *Why we love dogs, eat pigs, and wear cows: An introduction to carnism*. Newburyport, Red Wheel.
- McHugh, S. (2010). Real artificial: Tissue-cultured meat, genetically modified farm animals, and fictions. *Configurations* 18(1-2): 181-197.
- Milburn, J. (2016). Chewing over *in vitro* meat: animal ethics, cannibalism and social progress. *Res Publica* 22: 249-265
- Miller, J. (2012). *In vitro* meat: Power, authenticity and vegetarianism. *Journal for Critical Animal Studies* 10(4): 41-63.
- Rorheim, A. *et al.* (2016). Cultured meat: An ethical alternative to industrial animal farming. *Sentience Politics* 1: 1-14.

- Schaefer, G.O. and Savulescu, J. (2014). The ethics of producing *in vitro* meat. *Journal of Applied Philosophy* 31(2): 188-202.
- Scully, M. (2021). Hello cultured meat, goodbye to the cruelty of industrial animal farming. *National Review*, 17 January 2021. Available at: <https://www.nationalreview.com/2021/01/hello-cultured-meat-good-bye-to-the-cruelty-of-industrial-animal-farming/>.
- Sebo, J. (2018). The ethics and politics of plant-based and cultured meat. *Les ateliers de l'éthique / The Ethics Forum* 13(1): 159-183.
- Sinclair, R. (2016). The sexual politics of meatless meat: (in)edible others and the myth of flesh without sacrifice. In: Donaldson, B. and Carter, C. (eds.). *The future of meat without Animals*. Rowman & Littlefield, London, pp. 229-248.
- Singer, P. (2013). The world's first cruelty-free hamburger. *The Guardian*, 5 August 2013. Available at: <https://www.theguardian.com/commentisfree/2013/aug/05/worlds-first-cruelty-free-hamburger>.
- Stephens, N. (2013). Growing meat in laboratories: The promise, ontology, and ethical boundary-work of using muscle cells to make food. *Configurations* 21(2): 159-181.
- Stephens, N. *et al.* (2018). Bringing cultured meat to market: Technical, socio-political, and regulatory challenges in cellular agriculture. *Trends in Food Science & Technology* 78: 155-166.
- Tuomisto, H.L. and Teixeira de Mattos, M.J. (2011). Environmental impacts of cultured meat production. *Environmental Science & Technology* 45(14): 6117-6123.

68. New narratives of genetic engineering

P. Sandin

Dept of Crop Production Ecology, Swedish University of Agricultural Sciences, Box 7043, 750 07 Uppsala, Sweden; per.sandin@slu.se

Abstract

In this paper, I illustrate how some prevalent narratives of genetic engineering are being challenged by counter-narratives, delivered by discussants who are positive to these technologies. The examples come in the form an examination of Ronald and Adamchak's book *Tomorrow's Table* and researcher Stefan Jansson's 'trolling' of the EU system for GM plants, where he cooked what he claimed to be the world's first CRISPR meal in international media. I argue secondly that such narratives on genetic engineering can play a role in teaching and policymaking, and give tentative examples of how this can be implemented.

Keywords: narratives, narrative ethics, genetic engineering, casuistry, ethics teaching

Introduction

Moral evaluations are inevitably embedded in narratives. In some cases this is very obvious. Camus and Sartre expose their philosophy in the form of novels. Plato's dialogues are narrated on several levels, with stories nested within stories, such as when Socrates uses myths to make philosophical points. Even analytic philosophers, while shunning casuistry, rely heavily on stories, even though they are called 'thought experiments' or 'hypothetical cases'. And we present students with 'cases', 'dilemmas' or something similar. A number of philosophers take this to heart and go for a 'narrative' ethics. Perhaps the most well-known among them is Alasdair Macintyre (1984). In this paper I will highlight some narratives in the shifting discourse on the ethics of genetic engineering, argue that we ought to pay attention to them in teaching and policy making.

Gene editing and narratives

The notion of a narrative employed here is minimal and broadly Macintyrean. In the words of Alexander Rudd, a narrative 'links episodes over time in such a way as *to make sense* of them' (Rudd, 2007, p. 61, italics in original). In this sense, narratives are distinguished from chronicles (lists of events in temporal order), as well as from descriptions of mere causal sequences (ibid.). Narratives involve at least the elements of *agents* who *do things* for *reasons* over a period of *time*. The issues surrounding the use of biotechnology, in particular genetically modified crops, have been central to the debates on ethics in agriculture for over two decades (Cook, 2005, Scholderer, 2005, Schurman and Munro, 2010, Gregorowius *et al.*, 2012, Gerasimova, 2016). Since the 1990s, the debate in Europe has been slanted towards the biotechnology/GM-critical side, with a possible trend towards more somewhat more positive attitudes both among the general public and the media (Fischer and Hess, 2022). Throughout this debate, actors with an eye to potential benefits of agricultural biotechnology have ventured to provide *counter-narratives* to some of the standard biotechnology-critical narratives. Here I will focus on a particular type of counter-narratives, namely those that do *not* primarily attempt to debunk factual claims of the critics, as many of them have done in the past (e.g. Ammann, 2008). Rather they seek to legitimize pro-biotechnology projects, by also moving beyond what we may call the standard narratives from this camp, those of 'science says...' and 'feeding the world' (e.g. Conway and Toenniessen, 1999). There are several examples of such counter-narratives, for instance Mark

Lynas' (2018) story of his 'conversion' from being an anti-GMO activist, and the 'Rothamstead Appeal' from 2012 – a video posted by scientists in response to a video previously posted by anti-GMO activists calling for action against open-air trials of wheat genetically engineered to repel aphids (Mejri, 2021). Given the limited space, I will illustrate with just two cases: Ronald and Adamchak's (2009) book *Tomorrow's Table*, and Stefan Jansson's 'trolling' of the EU regulatory system for GMOs around 2016.

Recipes and retorts: Ronald and Adamchak on Tomorrow's table

Ronald and Adamchak (2009) is a book promoting the combination of organic farming and plant biotechnology. (A second edition appeared 2018). Ronald and Adamchak are a married couple and both are active at the University of California, Davis, in different disciplines. They are explicit about the fact that they are providing a narrative story (or stories) rather than straightforward arguments. In the preface, they write that the book is written 'as part memoir, part instruction, and part contemplation' (p. xi). There is even a discreet disclaimer offered in a note to the Acknowledgements, implying that the account is partly fictional.

One notable move in the book is how the authors position their endeavors as being *part of a long tradition of plant breeding*. At one point, Ronald describes her GE rice experiments in collaboration with her co-workers as a 'communal weaving of an ancient thread of DNA into the modern rice variety' (p. 9). Thus, the story told is not about modernity, industrialization and science, but conveys similarity and continuity:

... 10,000 years ago farmers in ancient Mesopotamia developed a hybrid between wild species of wheat and cultivated what became the ancestor of our modern bread wheat ... Today breeders manipulate plant species to create desired combinations of traits for specific purposes. [...] As with breeding, the goal of genetic engineering is to alter the genetic makeup of the crop. (p. 44)

This theme recurs. Their table of 'Highlights in the history of biological technology' starts with the Chinese cultivating rice around 4000 B.C.E., followed by Sumerians' discovering beer brewing and the Greeks practicing crop rotation. From there (250 B.C.E.) there is a jump to 1859 and Darwin's publication of *The Origin of Species*. Later years are considerably more detailed. The table lists the historical highlights characterized in three ways: *Year*, *Scientist* and *Discovery*. Among 'scientists', we meet not only the expected names, like Mendel and Rosalind Franklin, but also 'The Sumerians', U.S. Congress, and 'farmers'. These narrative moves serve to emphasize activities involving genetic engineering as *not so different* from other activities (traditional plant breeding, and so on). The same holds for the frequent inclusion of recipes.

Another example is the focus on *biography*. The issue of ownership and patenting is treated first by telling about Richard Jefferson, chairman of Center for the Application of Molecular Biology to International Agriculture, and his mission 'that not only those in the developed world should retain the knowledge and assume the benefits [of GE technologies]' (p. 138). This story stands in contrast to a common narrative of genetic engineering as being driven by large corporations and profit. Ronald also tells (in the first person) of how she was involved in developing a licensing scheme that would allow both commercial development of a biotechnological invention with support from non-profit institutions and how she contributed to establish a fund for study and conservation of resources in developing countries, as a means of compensating them for the sourcing of the genetic material. She does so in collaboration with 'a courtly, intelligent, and thoughtful Professor of Law' (John Barton) whom she accidentally meets at an airport.

Section 7

In all, *Tomorrow's Table* tells a set of stories about genetic engineering with actors who are diverse individuals with biographies, and who act for varied reasons. The technology is anchored in everyday experience, including providing recipes for meals.

The gardener cook: Stefan Jansson and the CRISPR cabbage

In an article aptly entitled 'Gene-edited plants on the plate: The 'CRISPR cabbage story'' (Jansson, 2018, my emphasis), Swedish plant science professor Stefan Jansson recounts how he and coworkers challenged the EU regulatory system for GMOs by showing how a new technology (CRISPR/Cas mediated genome editing) at the time of action had an unclear regulatory status with regard to whether it would fall under the GMO legislation or not. The issue has since been clarified through a judgment by the Court of Justice of the European Union, but discussions about implications and possible reform are ongoing (European Commission, 2021). According to the central EU legal document, Dir. 2001/18/EG, a genetically modified organism is 'an organism, with the exception of human beings, in which the genetic material has been altered in a way that does not occur naturally by mating and/or natural recombination.' In Annexes to the Directive, some technologies are non-exhaustively listed as resulting in GMOs, others are listed as *not* being GMOs (for instance, *in vitro* fertilization) and finally some are listed as resulting in GMOs but being *exempt* from the regulation – mutagenesis belongs here. The key point for Jansson is: Would plants mutated using CRISPR-Cas9 fall in the third, 'exempt' category, or not? The EU directive is implemented in Member States' national legislation, and in order to receive permission to perform GMO field trials, applications are made to the competent authority in the relevant member state. The first part of the story involves Jansson sending a letter to the competent authority, *Jordbruksverket* (Swedish Board of Agriculture) to the effect that 'If I should like to do a field experiment with an *Arabidopsis* plant mutated using CRISPR-Cas9, from which the 'foreign DNA' first introduced via *Agrobacterium*-mediated transformation has been segregated out, do I need to ask you?' (Jansson, 2018, p. 396). The letter contains a number of arguments why CRISPR mutated plants ought not to be covered by the legislation, as well as remarks that Jansson by writing the letter has fulfilled legal requirements of notifying the competent authority (Jansson, 2018, S1). In a reply, the Swedish Board of Agriculture asks for some more detailed and technical information, which Jansson provides. At the same time, the Board of Agriculture also receives a letter from the Swedish University of Agricultural Sciences, in which researchers planning field trials of CRISPRs-Cas9 edited *Arabidopsis* ask for clarifications similar to those requested by Jansson (Jansson, 2018, S4). The Board of Agriculture finally replies that their interpretation is that the edited plants that do not contain any 'foreign' DNA are exempt from the regulation, as are plants produced by other forms of mutagenesis.

The project is to a significant extent about telling a counter-story to some of the standard gene-technology critical narratives. This is evident also from the choice of mutant in the first place. Among the reasons that Jansson mentions are that the mutation provides no increased Darwinian fitness, but rather the opposite (countering concerns about environmental contamination, 'superweeds' and so on), and that it has no commercial interest, making arguments of company involvement irrelevant (Jansson, 2018, p. 399).

After the green light from the Swedish Board of Agriculture the storytelling really kicks off. Jansson gives a TEDx talk, in which he, like Ronald and Adamchak, emphasizes the long history of plant breeding. But he wraps up his talk by showing a bag of gene-edited seeds which he intends to sow, speaking of the potential for 'a very interesting situation', since 'these plants that we will have may suddenly become illegal. But the illegal plants are exactly the same as legal plants. ... Will the police come? I'll say 'Good luck – which are the illegal ones and which are the legal ones?' Because they are identical-' (Jansson, 2016a). The seeds Jansson talks about are gene-edited, but not *Arabidopsis* – they are cabbage seeds, obtained from a colleague, according to Jansson. He plants them in his garden and documents the process. In August the cabbage is harvested, a journalist from Swedish national public-service radio

is invited and they cook and eat what is possibly the 'first dinner based on a CRISPR genome-edited plant in the world'. Jansson writes a long blog post on Umeå University's researchers' blog chronicling the cultivation, cooking and eating of the CRISPR cabbage (Jansson, 2016b). It tells about Jansson's planting, his troubles with the diamond-back moths, and so on. It is in the form of a condensed diary, with dated entries, mixing the recounting of cultivating the CRISPR cabbage with personal reflections, observations about the weather, and a little bit of popular science. About a third of the blog post's text concerns when a radio reporter visits and Jansson cooks the CRISPR meal. It is also amply illustrated with photos of gardening, cooking and eating (in a visually pleasing sunny environment), and do not signal 'laboratory', 'science' or similar. He also, in a manner very similar to Ronald and Adamchak, presents a recipe for 'Tagliatelle with CRISPRy fried vegetables.' To add spice to the story as well as the dish the recipe includes '10 leaves of mysterious onion plant – to be replaced with a third of a leek.' This 'mysterious' plant 'was passed onto me by a friend more than 20 years ago. Actually, I'm not quite sure what it is as I haven't found anything like it in any gardening book' (Jansson, 2016b). Further situating the event in Jansson's local area and providing a sense of place, the recipe includes 'freshly grated Västerbotten cheese – can be replaced with Parmesan cheese.' The blog post ends with a PS including an image of Jansson's child and grandchild trying the cabbage captioned 'Younger generations of tasters.'

In the wake of the blog post, considerable international media interest follows (about 300 links are listed in Jansson, 2018, S9) and the storytelling expands into performance. Jansson cooks on international TV; there is a cooking competition with the cabbage, and a Michelin-starred restaurant serves CRISPR cabbage at a meeting for Experimental Biologists. Jansson also receives invitations to speak for academic and government audiences in Finland, Norway and Denmark. This leads to some complications generated by the uncertain legal status of the plants. For Norway, the organizers did not want the plant (whole or in parts), and Jansson writes that he brought it along on the flight, with an intention of eating it en route 'at the border between Sweden and Norway'. It is finally, however, 'destroyed by eating' (Jansson, 2018, p. 403) at Gardermoen airport (Oslo), with a piece of stem being left in a trash can – 'presumably it was taken into Norway for disposal' (ibid.). Jansson explains:

This was done to demonstrate that the Norwegian authorities would not be able to keep (untraceable) genome-edited plants out of the country, even if they demanded a guarantee that they would be traceable. (Jansson, 2018, p. 403)

To Denmark, he brings cabbage without disclosing whether it is gene-edited or not. These activities, he writes, 'pinpoint a lack of logic [...] indeed in the whole rationale for handling plants differently depending on whether they fall under Directive 2001/18/EG or ... similar regulations' (Jansson, 2018, p. 404). Here Jansson appears in the role of a jester or prankster (cf. Ashmore, 1993) who by humour exposes alleged inconsistencies in the regulation.

The central *actor* in this narrative is Jansson himself (and perhaps his cabbage), his *motives* are serious but jocular. He places himself in a *long tradition* but the story unfolds in real time, emphasizing the rapid speed of scientific progress, contrasted with the sluggishness of the regulatory one.

Implications and conclusions

There are several implications of recognizing the role of narratives. They can be incorporated into various advisory exercises involving the public, as they indeed already are (see e.g. Van den Burg, 2016). A situation where such an exercise might play a significant role occurs in the 'public morals review' as part of a process for assessment and approval of biotechnological products recently discussed by the Norwegian Biotechnology Advisory Board (Bioteknologirådet, 2018). This review is a step-wise evaluation of the moral justifiability of a product to be carried out *before* a traditional risk assessment. An

Section 7

application 'would have to prove that it is aligned with agricultural and environmental policy objectives and not in violation of any foundational ethical values and norms of Norwegian culture (i.e. that it does not offend Norwegian public morals)' (p. 35). The board does not specify how the process is to be run, but using narratives in trying to elicit what 'Norwegian public morals' amount to is potentially a way forward. The Norwegian proposal is unusual and other countries have more expert-driven processes. One example is Sweden who since 1994 has an advisory body, the Gene Technology Advisory Board, containing members of parliament as well as experts (including professional ethicists). Even in such a context, the use of narratives could be encouraged. One way of nudging experts into adopting such a practice is to construct document templates for officials who prepare the cases for discussion, so that the cases are stated in a manner that makes them meaningful stories, involving actors over the course of a period of time. This would require them to identify the narratives and recognize their elements: *Who* are the actors? What are their *reasons*? How long is the *timeframe*? Possible benefits of this approach are its simplicity and the fact that it does not require unreasonable amounts of time, which can be an issue when using tools like the Ethical Matrix (Moula and Sandin, 2017).

Teaching is another area. Concretely, those of us who teach can do the following: Be aware that an issue allows the telling of different stories. Encourage students to engage with them. A practical implementation as an exercise could be to divide students into two groups and present one group with material stating arguments using one story, and the other group with a different one. One could perhaps use material from Stefan Jansson's 'performance' and counter it with materials from a technology advisory board. Students would be asked to evaluate the actions of the involved actors over time. This would require them to identify the narratives and recognize their elements. Such an exercise would work best if the stories do not contain outright misinformation – that kind of exercise is also very useful, but has a different purpose.

This approach can complement ones using other frameworks and tools for facilitating analysis and discussion of ethical issues. It might also in the long run be a way of improving the training of professional ethicists (some of our students are future professional ethicists) so that they may be less prone to 'translate the principles which shape their approach into a general checklist, which significantly shrinks the amount of topics that they are able to take into account' (Van der Burg, 2016, p. 234).

References

- Ammann, K. (2008). Integrated farming: why organic farmers should use transgenic crops. *New Biotechnology* 25: 101-107.a.
- Ashmore, M. (1993). The theatre of the blind: starring a Promethean prankster, a phoney phenomenon, a prism, a pocket, and a piece of wood. *Social Studies of Science* 23: 67-106.
- Biotechnologirådet [The Norwegian Biotechnology Advisory Board]. (2018). The Gene Technology Act – Invitation to Public Debate. <https://www.biotechnologiradet.no/filarkiv/2010/07/genteknologiloven-engelsk-hele-for-web-v-2.pdf>.
- Conway, G. and Toenniessen, G. (1999). Feeding the world in the twenty-first century. *Nature* 402: C55-C58.
- Cook, G. (2004). *Genetically Modified Language: The Discourse of Arguments for GM Crops and Food*. Routledge, London.
- European Commission (2021). Study on the status of new genomic techniques under Union law and in light of the Court of Justice ruling in Case C-528/16. SWD(2021)92.
- Fischer, K. and Hess, S. (2022). The Swedish Media Debate on GMO between 1994 and 2018: What attention was given to farmers' perspectives? *Environmental Communication*, 16: 43-62.
- Gerasimova, K. (2016). Debates on genetically modified crops in the context of sustainable development. *Science and Engineering Ethics* 22: 525-547.

- Gregorowius, D., Lindemann-Matthies, P., Huppenbauer, M. (2012). Ethical discourse on the use of genetically modified crops: A review of academic publications in the fields of ecology and environmental ethics. *Journal of Agricultural and Environmental Ethics* 25: 265-293.
- Jansson, S. (2016a.) To be or not to be a GMO, that is the question. TEDx Talk, Umeå. <https://www.youtube.com/watch?v=kyrsNa1jLpo>.
- Jansson, S. (2016b). Future garden plants are here! A diary about the world's first CRISPR-edited plants. Archived at <https://web.archive.org/web/20180508184209/https://www.blogg.umu.se/forskarbloggen/2016/09/future-garden-plants-are-here-a-diary-from-the-first-crispr-edited-plants-in-the-world/>.
- Jansson, S. (2018). Gene-edited plants on the plate: The 'CRISPR cabbage story'. *Physiologia Plantarum* 164, 396-405.
- Lynas, M. (2018). *Seeds of science – why we got it so wrong on GMOs*. Bloomsbury, London.
- MacIntyre, A. (1984). *After Virtue: A Study in Moral Theory*. 2nd ed. University of Notre Dame Press, Notre Dame.
- Mejri, O. (2021). *Agencies and counter-agencies shaping concerned-markets: The Rothamsted GM-wheat open-air trials case*. PhD thesis, Lancaster University. <https://eprints.lancs.ac.uk/id/eprint/164045/1/2021mejriphd.pdf>.
- Moula, P. and Sandin, P. (2017). Ethical tools. In: Hansson, S.O. (ed.) *The Ethics of Technology*. Rowman and Littlefield International, London and New York, pp. 115-127
- Ronald, P. and Adamchak, R. (2008). *Tomorrow's Table: Organic Farming, Genetics, and the Future of Food*. Oxford University Press, Oxford.
- Rudd, A. (2009). In defence of narrative. *European Journal of Philosophy* 17: 60-75.,
- Scholderer, J. (2005). The GM foods debate in Europe: history, regulatory solutions, and consumer response research. *Journal of Public Affairs* 5: 263-274
- Schurman, R and Munro W.A. (2010). *Fighting for the Future of Food: Activists versus Agribusiness in the Struggle over Food Biotechnology*. University of Minnesota Press, Minneapolis.
- Van der Burg, S. (2016). A lay ethics quest for technological futures: About tradition, narrative and decision-making. *Nanoethics* 10: 223-244.

conference was called: Skjervold had created the first transgenic fish, and proudly announced that he had successfully transferred genes coding for growth hormones into salmon and rainbow trout, with the result that giant salmon could be farmed. When asked about the origin of the gene, Skjervold answered only that it came from a mammal. A few days later, however, it was revealed on the evening news that the genes which had been used in the experiment were human, causing a national public outrage and Frankenstein-syndrome accusations. The theologian Jakob Jervell was interviewed about the experiment: 'I am not worried about the creation of human salmon or salmon human as a result of this experiment. But we are approaching a border, the crossing between human and animal' (Sætre and Østli, 2021, p. 45).

As Nielsen *et al.* comment when they write about this story, the combination of human genes, giant salmon and scientific secrecy made the genetically modified salmon into a standard example of ethically problematic and risky genetic research (Nielsen *et al.*, 2000, p. 239). The event changed the climate for discussions about transgenic bioproduction, and around 1990, the research project was ended and all the material destroyed (Nielsen *et al.*, 2000, p. 239). Peter Alestrøm, a Swedish zebrafish expert who participated in Skjervold's research, commented years later that the industry considered the research to have been damaging – the salmon had to be perceived as natural (Sætre and Østli, 2021, p. 46).

A natural solution

Jervell was concerned with the crossing of species barriers, with the implication that doing so is tampering with nature. The idea that the use of gene technologies on plants and animals is unnatural has been a recurring argument in debates about gene modification in the past (Bartkowski *et al.*, 2018). When it comes to public acceptance of gene technologies, this concern is expressed as a worry that using such technologies represent a breach of some fundamental values or principles of order, where applications represent either an interference with the works of God or harms towards the order of nature (Lassen and Jamison, 2006, p. 24).

There are high hopes that such attitudes may change with CRISPR, however. While GMOs usually are produced by inserting genes from other organisms, this is not required to use CRISPR, which can achieve the desired alterations internally, in a less invasive, more 'natural' way. Since CRISPR avoids this crossing species-objection, it has been argued that it could be an ethical game changer (Schultz-Bergin, 2018). CRISPR can be understood as a technology that has acknowledged public rejection of GMOs, offering an opportunity to achieve the same results while sidestepping the reasons that made GMOs problematic.

The notion of naturalness in these debates, however, is a contested one. First, both the terms 'natural' and 'unnatural' are ambiguous. As De Graeff *et al.*, argue, they may be described as *essentially contested concepts*, which means that they are value-laden and cause different users to prefer different meanings, leading to disputes that cannot be settled (De Graeff *et al.*, 2022, p. 8). Second, while perceived naturalness remains an important criterion for citizens assessing new technologies, it is generally not considered a relevant concept by scientists (Myskja *et al.*, 2015, p. 95). Among other reasons, it has been dismissed on the grounds that it rests on the mistaken view of species as fixed and immutable rather than dynamic and everchanging (Rollin, 2003, p. 15).

But while the concept of naturalness rarely occurs in scientific literature about CRISPR, it is frequently appealed to in science communication to the public. Kevin Doxzen, a biophysics researcher working at CRISPR originator Jennifer Doudna's Innovative Genomics Institute, writes about how he was engaged to help communicate the new technology to stakeholders and the public. In the presentations he would give, Doxzen encountered among the audiences familiar worries grounded in past concerns about GMOs: That they are unsafe, unnatural, environmental hazards (Doxzen and Henderson, 2020, p.

866). To avoid CRISPR being added to the GMO-narrative, Doxzen writes that he would intentionally distance the new technology from the older, describing how CRISPR-edited crops can be seen as more natural than GMOs (Doxzen and Henderson, 2020, p. 866). A similar approach is taken in an interview with Norwegian newspaper *Morgenbladet*, where molecular biologist Sigrid Bratlie argues that the narrative surrounding genes and gene technology is paradoxical – ‘Altering genes is perceived as something very unnatural, but I would rather argue that it is one of the most natural things there is.’ (Elnan, 2022). Another example is found in an interview with *The New York Times*, where André Choulrika, a chief executive for a company developing gene edited foods, explains that contrary to older GMO technologies, [t]here is nothing taken out or added to the plant. It is what nature would have produced.’ (Chang, 2017). The concept of naturalness, then, is frequently appealed to when gene modification and gene editing technologies are explained to the public.

As long as the concept of naturalness continues to be used in science communication and continues to be central in the discourse surrounding gene technologies, it is important to consider how this concept plays into evaluations of the acceptability of gene technologies. The farmed salmon presents a particularly good case for thinking about our understanding of naturalness. Salmon has been domesticated at a higher speed and more recently in our history than any other animal. Since the late Sixties, a systematic breeding program has ensured that different traits having been selected and cultivated to better adapt it to our production needs. As a result, farmed salmon has become far removed from the context of its wild cousin, swimming around in circles in pens and thought to be about as luxurious as fish fingers. If farmed salmon is already an ‘unnatural’ animal, does it matter whether the tools that are used to alter it further are also considered to be unnatural?

The life and values of a swimming vegetable

Informing this article are 19 interviews with stakeholders and four focus groups with consumers. The stakeholders were representatives from the salmon farming industry, research, NGOs and various advisory boards. From these discussions, two things emerged. First, the notion of naturalness seems to matter little when people assess the acceptability of using CRISPR on farmed salmon. Instead, the concern seems to be about whether different applications of CRISPR is consistent with a respectable treatment of the farmed salmon. Second, preservation of the natural is still a major motivating factor for taking CRISPR into use, as making the farmed salmon sterile is considered justifiable because it helps preserve the wild salmon.

One place in which these views tended to emerge, was when participants discussed the differences between wild and farmed salmon. In an interview with a person working on the administrative side of the salmon farming industry, the question of when a salmon ceases to be a salmon arose:

Some people say today that salmon is a swimming vegetable because it is fed with raw materials it was not originally intended to eat. [...] Of course, it’s still a salmon and it’s still salmon protein, so nothing has changed in that sense. But [...] those claims will reach a new level if we start editing the hereditary material. When does it cease to be a salmon?

Such views give clear expression to the fact that wild and farmed salmon are valued differently. As stated above, the wild salmon holds an iconic status in Norwegian culture that ‘swimming vegetables’ in pens cannot compete with. As Lien observes, with the rapid development in genetic research, there has been a shift from considering morphology and behaviour to mapping the differences between domesticated and non-domesticated species as genetic (Lien, 2015, p. 9). She writes, ‘the word *domestication* enacts a detectable difference between life-forms that are ‘pristine’ and those that are somehow ‘invented’ (Lien, 2015, p. 9).

That there is a crucial difference between farmed and wild salmon was consistently pointed out. Of course, there are differences between them in terms of how natural they are, it was argued. For one thing, as one focus group participant pointed out, the wild salmon is hunted and has the possibility of escape. The farmed salmon, on the other hand, 'are just there for us to eat it'. Another participant, an NGO-representative, pointed out that the wild salmon is 'a fascinating animal that is part of a larger ecosystem, [...] it is in the ocean and in the rivers, and it interacts with so many incredible species' while the farmed salmon 'has no such function in an ecosystem, it is merely produced to give us something to eat.'

Despite such derogatory descriptions, which shows that the wild salmon is valued higher than the farmed salmon, it was consistently pointed out by participants across the board, from NGO-representatives, salmon farmers and members of the public, that we have an equal responsibility towards both – many adding that this responsibility might even be higher for the farmed salmon, since it is we who have brought it into existence, and since we have special responsibilities for animals in husbandry. This latter position is in keeping with relational approaches to animal ethics (Palmer, 2010). Both animals, participants argued, have intrinsic value, and respect of this intrinsic value was frequently put in connection with fish welfare. Respecting the intrinsic value of a fish means treating it well and allowing it to live a life which is as natural for it as possible. This is brought out by one focus group participant in the following quote:

Sure, the wild salmon is more natural, but either way it is a life, and when you first have created that life, you have to give it good opportunities, I believe. And that's the animal welfare too – perhaps in the end it's about, that is, with good animal welfare, the intrinsic value is preserved.

If CRISPR is to be taken into use, this has to be consistent with the salmon living good lives. Frequently, this view was expressed as a respect for the animal's intrinsic value, as in the quote above. What became clear, is that for many, fish welfare is about more than the absence of pain and diseases, such as the ones that arise from lice. Welfare was defined more broadly as letting the salmon live good lives, meaning that they live as naturally as possible. In this context, 'natural' probably means living out their species-specific behaviour. A focus group participant, for example, pointed out the following with regards to a genome edited sterile salmon: 'They [sterilized farmed salmon] don't get that pleasure – I assume there is some pleasure in breeding. I have seen fish, I have an aquarium and I have seen the fish do it, it's part of their daily lives in a way.'

When participants were asked about which conditions they would require to be in place in order to consider CRISPRed salmon to be acceptable, the arguments they would raise would not concern the naturalness of the technology or the fish. A frequent finding was that participants who were asked directly about the perceived naturalness of CRISPR-salmon and the differences between CRISPR and gene modification technologies would often reject the problem, turning the issue back to the question of fish welfare. One good example of this is a discussion we had with a salmon farmer. We had briefly explained that a sterile salmon is in development, and asked the participant what he thought about using this fish in industrial production. He acknowledged that this would solve one of the main problems – namely escapees breeding with wild fish – but remained sceptical. We asked if this scepticism would remain if it could be guaranteed that a sterile salmon would involve no environmental hazards, and if so, what the scepticism would consist of. The immediate response was fish welfare. While noting that using CRISPR to get rid of diseases would be a good thing, he worried about where to draw the intervention line. When asked about the difference between inserting genes from other organisms and doing internal edits, he sidestepped the distinction in his response, noting only that it would 'require a lot' to convince him that it was ok, and that this requirement is about 'the health of the individual that is being manipulated.' 'But,' he reflected, 'who is going to ask the salmon about that?'

Section 7

In other words, respectful treatment of salmon seems to matter more than the question of whether or not the salmon is perceived as natural, as Alestrøm worried. In practice, however, the larger responsibility we have for the farmed salmon comes in conflict with the perceived higher value of the wild salmon. This became clear when discussing the paradigmatic case for using CRISPR on salmon, namely sterilizing it. Even if sterilizing the farmed salmon is seen as potentially being objectionable, as witnessed in the quote above, a consistent finding throughout was that this is an intervention many are willing to accept because of its greater good – preserving the wild salmon. One focus group participant, while describing ‘meddling with genes’ as ‘scary’, noted that preventing farmed salmon from breeding with the wild, seems smart and useful. A NGO representative who throughout our conversation had objected to gene editing of animals as involving instrumentalization of them, and who argued that while ‘it is a nice thought to protect the wild animals against our interventions, we should rather stop those interventions than cause more suffering to the tame animals’, also thought it would be crucial not to ruin the genetics of the wild salmon.

This indicates that even if the concept of naturalness seems to matter little when evaluating the farmed CRISPR-salmon in isolation, it still comes into play when we consider it in relation to the wild salmon. As one salmon farming employee pointed out, ‘it is the intrinsic value in a way of an unaffected wild salmon that underlies this idea that you don’t want any involvement.’ Though the concept ‘natural’ is not used here, the term ‘unaffected’ assumes it. The salmon farming employee continued to note that interventions in intrinsic values of animals is not a discussed topic in agri- or aquaculture – fish are bred in ways to make it safer for nature and the fish itself: ‘no one holds back because we should preserve the intrinsic value of that species – in that case, it must be the wild species you want to preserve the intrinsic value of.’ Preserving the natural remains an important aspect of assessing acceptable uses of CRISPR.

Conclusions

Though the concept of naturalness is frequently appealed to in science communication of CRISPR, it is to a lesser extent a concern for the public than what has been the case for GMOs. Once the crossing species barrier-objection has been dealt with, the discourse shifts to other concerns; fish welfare, in the case of salmon. However, the very unnaturalness of farmed salmon seems to be a premise for its application, since the study also finds that the wild salmon should be preserved in its pristine state.

Mary Midgley writes that when we say that something is unnatural, we mean that it calls on us to alter our whole conception of nature (Midgley, 2000, p. 12). When we consider how farmed and wild salmon are conceived differently, it becomes clear that different conceptions of nature are involved for each of their scenes. In the case of the farmed salmon, there is a general acceptance of the dominance we have already subjected it to, the unnaturalness of it, and hence the conversation moves to how we treat our animals respectfully. Unlike Dr. Frankenstein, we realize the responsibilities we have for our creatures. But there is a resistance and hesitancy against moving further in this direction and put ourselves in yet more extensive control over the fish. Seemingly, only to preserve the natural are we willing to do so.

References

- Artsdatabanken. (2021). Norsk rødliste for arter 2021. <https://artsdatabanken.no/lister/rodlisteforarter/2021>
- Bartkowski, B., Theesfeld, I., Pirscher, F. and Timaeus, J. (2018). Snipping around for food: Economic, ethical and policy implications of CRISPR/Cas genome editing. *Geoforum*, 96(August), 172-180. <https://doi.org/10.1016/j.geoforum.2018.07.017>
- Chang, K. (2017, January 9). These foods aren’t genetically modified but they are edited. *The New York Times*. <https://www.nytimes.com/2017/01/09/science/genetically-edited-foods-crispr.html>

- De Graeff, N., Buijsen, M. and Bredenoord, A. (2022). On the nature of nature. A study on the use and meaning of nature and (un)naturalness in the literature on genetic modification.
- Doxzen, K. and Henderson, H. (2020). Is This Safe? Addressing Societal Concerns About CRISPR-Edited Foods Without Reinforcing GMO Framing. *Environmental Communication*, 14(7), 865-871. <https://doi.org/10.1080/17524032.2020.1811451>
- Elnan, T. (2022, February 11). Kyr uten horn og gladere laks: Nå fødes fremtidsdyrene. *Morgenbladet*. <https://www.morgenbladet.no/aktuelt/reportasje/2022/02/11/kyr-uten-horn-og-gladere-laks-na-fodes-fremtidsdyrene/>
- Lassen, J. and Jamison, A. (2006). Genetic technologies meet the public: The discourses of concern. *Science Technology and Human Values*, 31(1), 8-28. <https://doi.org/10.1177/0162243905280021>
- Lien, M.E. (2015). *Becoming salmon: Aquaculture and the domestication of a fish*. University of California Press.
- Midgley, M. (2000). Biotechnology and monstrosity. Why we should pay attention to the 'yuk factor'. *Hastings Center Report*, 30(5), 7-15.
- Myskja, B.K., Schouten, H.J. and Gjerris, M. (2015). Ethical distinctions between different kinds of plant breeding. In: Dumitras, D.E., Jitea, I.M. and Aerts, S. (eds) *Know your food: food ethics and innovation*. Wageningen Academic Publishers, Wageningen, the Netherlands, pp 95-100.
- Nielsen, T.H., Monsen, A. and Tennøe, T. (2000). *Livets tre og kodenenes kode. Fra genetikk til bioteknologi Norge 1900-2000*. Gyldendal.
- NOU 1999:9. *Til laks åt alle kan ingen gjera?* (1999).
- Palmer, C. (2010). *Animal ethics in context*. Columbia University Press.
- Rollin, B.E. (2003). Ethics and Species Integrity. *American Journal of Bioethics*, 3(3), 15-17. <https://doi.org/10.1162/15265160360706435>
- Sætre, S. and Østli, K. (2021). Den nye fisken. Om temmingen av laksen og alt det forunderlige som fulgte. *Spartacus*.
- Schultz-Bergin, M. (2018). Is CRISPR an Ethical Game Changer? *Journal of Agricultural and Environmental Ethics*, 31(2), 219-238. <https://doi.org/10.1007/s10806-018-9721-z>
- Wargelius, A., Leininger, S., Skafnesmo, K. O., Kleppe, L., Andersson, E., Taranger, G. L., Schulz, R. W. and Edvardsen, R. B. (2016). Dnd knockout ablates germ cells and demonstrates germ cell independent sex differentiation in Atlantic salmon. *Scientific Reports*, 6(5817), 1-8. <https://doi.org/10.1038/srep21284>

Section 9.

Ethical issues in marine and aquaculture

70. Consumers' perception of fish welfare in South Korea

T. Choi*, S. Joo, J. Bae and M.S. Chun

Center for Animal Welfare Research, Research Institute for Veterinary Science, College of Veterinary Medicine, Seoul National University, 1 Gwanak-ro, Gwanak-gu, Seoul, 08826, Republic of Korea; taegy@snu.ac.kr

Abstract

Despite their sentient ability, fish are protected with limitations against anthropocentric use. International animal welfare norms are widely accepted, but species inequality still exists. Fish welfare is a topic yet addressed in academia and animal protection organizations in South Korea, one of the countries with the highest consumption of aquatic products in the world, routinely consuming live fish. This study, therefore, aimed to investigate the public perception of and intention to care for fish welfare. A survey was designed to explore: (1) general awareness of fish; (2) awareness of the current status of farmed fish welfare; (3) improvement measures for fish welfare; and (4) attitude toward animals in general (AAS). We collected survey data from an online panel survey of 1000 people with a population-proportional allocation to 17 cities and provinces in South Korea (May 7th to 11th, 2021). Although 89.2% of the participants agreed that the suffering of fish during slaughter should be minimized, only half of them considered the live fish transport can be a painful experience for fish. Totally 38.5% of the participants agreed that we should protect fish by animal protection law. According to the regression analysis, those aware of fish's emotions and learning ability, felt negative emotions when seeing fish slaughter, and had pro-animal attitudes (high AAS-10) were likely to consent to legal protection for fish (adjusted $R=0.295$, $P=0.000$). Although 60.2% of the participants are enjoying it, 54.8% of them had the intention to stop eating live fish for animal welfare reasons. According to the regression analysis, women, the older generation, the unmarried were likely to stop eating live fish for animal welfare reasons (adjusted $R^2=0.377$, $P=0.000$). The older, female and unmarried respondents showed a higher tendency to give up buying live fish for welfare. Also, those who had more negative emotions when seeing fish slaughter and stronger pro-animal attitudes show a higher intention to stop eating live fish. This study will serve as an initial point for establishing policy directions for improving the welfare of aquaculture fish in East Asia and expanding the scope of the animal protection regulation.

Keywords: fish welfare, consumer perceptions, animal attitudes, live fish consumption, animal protection act

Introduction

Fish are protected as vertebrates by the Korean Animal Protection Law. In the law, all vertebrates, including mammals, birds, reptiles, amphibians, and fish, are subject to protection, but reptiles, amphibians, and fish raised for food are excluded (The Korean Law Information Centre, 2020). However, all reptiles, amphibians, and fish have been practically pushed outside the confines of regulations, as there is no institutional way to prove whether they are raised for food or not. Compared with broilers slaughtered in 2020 (1,605,624 tons, based on 1.5 kg market weight) or beef cattle production (2,133,000 tons, based on market weight 600 kg), fish farming occupies a critical portion of the Korean food supply (88,188 tons, about 767,534,000 USD), and production is increasing every year. It is estimated that the number of farmed fish is more than 400 million. In terms of species, olive flounder (*Paralichthys olivaceus*) accounts for about half (49.6%), followed by Korean rockfish (*Sebastes schlegelii*) (24.4%), mullets (*Mugil cephalus*) (9.6%), and red sea bream (*Pagrus major*) (6.5%) in 2020 (The Korean Law Information Centre, 2020). Because they are consumed raw, most of the farmed fish are distributed alive until just before consumption. The distribution of farmed fish alive entails a welfare risk. Conventionally,

Section 9

fish raised by open-net pens and water tanks on the land system are transported by tank lorries designed to keep fish alive for days in South Korea. When the fish arrive at the retail stores and restaurants, they are handled with a scoop net into the tank. This type of live fish distribution compromises their welfare because farmed fish are in an unfamiliar and stressful environment during the transportation for days before being slaughtered. Public appreciation of animal welfare has been rapidly improved in South Korea, whereas there is a selective preference on species when the public considers animal welfare. Given this situation, consumers' perception of fish welfare and intention to change eating habits need to be investigated to establish a better and proper welfare policy for fish.

Methods

A questionnaire was designed to explore: (1) general awareness of fish; (2) improvement measures for fish welfare; and (3) attitude toward animals in general (AAS). We collected survey data from an online panel survey of 1,000 people who can access the internet between 20 and 69 years old by quota sampling method with a population-proportional allocation to 17 cities and provinces in South Korea (May 7th to 11th, 2021). The survey collected demographic characteristics (age, sex, average monthly household income, final education, political orientation, pet ownership). Two knowledge questions were asked about the fish' ability to feel pain and avoidance of it, and to have emotions and learn from it. Participants were asked to indicate their preference for raw fish using a 4-point Likert Scale. Their pro-animal attitudes were measured using the AAS-10 (Herzog *et al.*, 2015). We asked consumers' agreement on the fish welfare interventions on a 4-point Likert Scale; the inclusion of food fish into Animal Protection Law, reduction of distribution of live fish, giving up purchasing raw fish, willingness to buy fish welfare products. Data handling and analysis were performed using SPSS (ver. 26, IBM). Regression analysis examined the relationship between explanatory (demographic characteristics, knowledge, preference of raw fish) and dependent variables (consumers' agreement on the fish welfare interventions).

Results

By age, those in their 50s accounted for the most at 23.3%, while those in their 20s and 30s accounted for the lowest at 18.2%, respectively. The sex ratio of the respondents was 48.9% for females and 51.1% for males. 33.5% of the respondents belong to the average monthly income group of 5~10 million Won (4,047~8,094 USD) and 30.3% to the group of 3~5 million Won (2,428~4,047 USD). The educational level of the respondents was found in the order of high school graduates or lower (22.9%), college graduates (66.8%), and masters or higher (10.3%). The moderate group was the highest at 37.7% in terms of political orientation. The combined ratio of somewhat progressive and progressive (28.4%) was slightly higher than somewhat conservative and conservative (21.1%). 56% of respondents have had pets, and 44% have not.

In response to the two knowledge questions, 54.5% of the respondents were aware that fish have organs to detect pain and respond for it by avoiding it, and 34.7% knew that fish feel emotions such as pleasure, fear and learn from it.

The mean value of preference for raw fish is 2.69 (SD=0.908, 4-point scale). Male on average shows higher preference than female by *t*-test (mean of male = 2.76, mean of female = 2.62, *t* = -2.508, *P* < 0.05) but there is no significant difference depend on age. Respondents with higher income (*F* = 3.31, *P* < 0.05), the lower the sum of AAS (*F* = 2.76, *P* = 0.000) enjoy raw fish more. The AAS-10 of which full score is 50 by sum of 10 questions (mean = 34.24, SD = 5.803) measured the pro-animal attitude. The younger (*F* = 3.96, *P* < 0.01) women (*F* = 128.31, *P* = 0.000) who were politically progressive (*F* = 11.34, *P* = 0.000) and experienced of keeping companion animals (*F* = 17.72, *P* = 0.000) showed the stronger pro-animal attitude.

As for consumers' agreement on the fish welfare interventions, 65% agreed to food fish welfare legal protection (mean=2.761 by a 4-point scale, SD=0.765). However, less than half of respondents (45.8%) agreed to reduce live fish distribution (mean=2.444 by a 4-point scale, SD=0.797). Koreans who will give up purchasing raw fish from the fish welfare reason (mean=2.573 by a 4-point scale, SD=0.910) is more than half (54.8%). And 67.7% of respondents have a willingness to buy fish welfare products (mean=2.158 by a 4-point scale, SD=1.022) but 32.3% did not.

According to the regression analysis (Table 1), pro-animal attitude and preference for live fish showed the highest explanatory power for reducing live fish distribution (adjusted $R^2=0.384$, $P=0.000$). Those aware of fish's emotions, learning ability, and pro-animal attitude (high AAS-10) were likely to consent to legal protection for fish for food (adjusted $R^2=0.276$, $P=0.000$). Women and those who did not enjoy live fish and had a pro-animal attitude (high AAS-10) were likely to give up purchasing live fish for animal welfare reasons (adjusted $R^2=0.384$, $P=0.000$). Also, those with stronger pro-animal attitudes and the rich showed more willingness to pay for fish welfare (adjusted $R^2=0.157$, $P=0.000$).

Discussion

The live fish consuming culture was rapidly formed in such a short time in Korea. In the 1990s, thanks to the rapid economic growth of the 1970s and 1980s, the development of foodservice culture, the development of various manufacturing industries necessary for aquaculture, transportation, and storage of live fish, and the demand for fresh seafood stemming from frequent food poisoning accidents resulting from fishery products in the 1980s. The practice of selling live fish at raw fish restaurants has become

Table 1. Results of regression analysis.

Interventions	Legal protection of food fish welfare		Reduction of distribution of live fish		Giving up purchasing raw fish		Willingness to buy fish welfare products	
	Beta	SE	Beta	SE	Beta	SE	Beta	SE
Constant		0.250		0.240		0.273		0.360
Demographics								
Age	-0.033	0.016	0.016	0.015	0.059*	0.027	0.004	0.023
Sex (female=0)	-0.056	0.045	-0.041	0.043	-0.097***	0.049	0.033	0.064
Average monthly household income	0.009	0.020	-0.006	0.019	-0.011	0.022	0.106***	0.028
Final education	0.061*	0.034	0.057*	0.032	0.048	0.037	0.021	0.049
Political orientation	0.044	0.017	-0.001	0.016	-0.023	0.018	0.033	0.024
Pet ownership experience	0.052	0.027	0.027	0.026	0.020	0.030	-0.019	0.039
Knowledge								
Fish pain	-0.023	0.046	0.011	0.044	-0.008	0.051	0.079*	0.067
Fish fear	0.123***	0.048	0.004	0.046	0.046	0.053	0.026	0.070
Preference for live fish	-0.054	0.024	-0.125***	0.023	-0.290***	0.026	-0.066*	0.035
Pro-animal attitudes	0.341***	0.004	0.246***	0.004	0.306***	0.005	0.270***	0.006
adjusted R	0.268		0.377		0.380		0.147	
F value	34.184		55.965		56.781		16.683	
P-value	0.000		0.000		0.000		0.000	

* $P<0.05$; ** $P<0.01$; *** $P<0.001$.

Section 9

common. In the 1990s, the keyword 'live fish' appeared in the media. Live fish restaurants have been marketing their fish tanks to store live fish while displaying them outside the restaurant to emphasize freshness. Although no data is proving the length of period that fish being moved and staying alive in the tank before consumption, considering the repeated changes in quality, temperature, the pressure of water, vibration of vehicles, handling and overcrowded conditions (Ellis *et al.*, 2002), and the resulting stress during the transportation process (Bandeem and Leatherland, 1997; Rouger *et al.*, 1998) an lead fish to a higher intensity of stress over a longer period than terrestrial livestock transported only to the slaughterhouse. Fish can feel and avoid pain (Braithwaite, 2010) and learn from emotions (Kittilsen, 2013), which means they are evolutionarily close to humans and humans can sympathize with them more easily. However, according to this survey, about half of the consumers are not aware of the pain and emotions of fish in South Korea. However, those who are aware of fish's ability to feel pain and fear are more likely to agree to the legal protection of fish welfare and to buy fish welfare products. Education on animal welfare can enable people to sympathize with the pain of fish and to create social norms based on it.

Preference for live fish is correlated with a tendency to oppose the reduction of the distribution of live fish, giving up the purchase of live fish, and the willingness to buy fish welfare products. Consumers, especially those belonging to young male group, with a high preference for live fish were less likely to change their consumption behaviour. In Korean society, it seems difficult to quickly establish or implement a policy that opposes the tastes of those with more gender power. At the same time, the higher-income groups were more willing to buy fish welfare products. In animal welfare production, high price is often mentioned as a barrier. But live fish markets demanding a high standard of food safety may more easily accept the animal welfare regulation and high price because of their high-income group of consumers. Food safety issues such as contamination of bacteria, viruses, and the use of antibiotics and chemicals in fish can be presented in the One Health and One Welfare frames. Inflicting more suffering on the fish can place a sanitary and moral burden on consumers.

65.5% of the consumers agree to include food fish in legal protection and 67.7% would want to buy fish products considering animal welfare even if they incur additional costs. Moreover, more than half said they would give up on the purchase of live fish for fish welfare reasons. Their intention to change behaviour can be seen as a green light for the fish welfare reinforcement policy. In addition, the impact of live fish preference on the agreement to legal protection of fish is insignificant, there may be little resistance from consumers to the policy.

Among the independent variables, pro-animal attitudes have a significant influence on all interventions for fish welfare. Considering the recent tendencies of growing pro-animal attitude support for fish welfare is expected to increase in the future. In this study, although political orientation or pet ownership did not directly affect the support for interventions, they can indirectly affect the pro-animal attitudes.

Despite their sentient ability, the welfare of fish is a topic yet addressed in academia and animal protection organizations in South Korea, one of the countries with the highest consumption of aquatic products in the world, routinely consuming live fish. Consumers' awareness and demands on safe food and pro-animal products can pressure higher animal welfare standards. Further study would identify what conditions contribute to compromising welfare in fish farming and suggest how to inform consumers about the One Health risk of conventional fish farming practices.

Conclusions

Korean consumers vaguely accept that fish should be subject to ethical consideration. This study showed support for the legal protection of fish and willingness to change behavior for animal welfare. Protecting fish farmed under the Animal Protection Act and setting standards for fish welfare in Korea can be enforced by public demand and international trade pressure. However, academia and industry lack an understanding of fish welfare. More effort from both fields will be needed to change traditional aquaculture practices and food businesses.

References

- Ellis, T., North, B., Scott, A.P., Bromage, N.R., Porter, M. and Gadd, D. (2002). The relationships between density and welfare in farmed rainbow trout. *Journal of Fish Biology*. 61, 493-531.
- Herzog, H., Grayson, S. and McCord, D. (2015) Brief Measures of the Animal Attitude Scale. *Anthrozoös*. Vol 28, Issue 1. 145-152.
- Janice Banteen and John F. Leatherland (1997) Transportation and handling stress of white suckers raised in cages. *Aquaculture International*. 5, 385-396.
- Rouger, Y., Aubin, J., Breton, B., Fauconneau, B., Fostier, A., Le Bail, P., Loir, M., Prunet, P. and Maise, G. (1998). Response of rainbow trout (*Oncorhynchus mykiss*) to transport stress. *Bulletin Francais de la Peche et de la Pisciculture*. (350-351), 511-519.
- Silje Kittilsen (2013) Functional aspects of emotions in fish. *Behavioural Processes*. Vol 100, 153-159.
- The Korean Law Information Centre. <https://www.law.go.kr/LSW/eng/engMain.do>
- Victoria Braithwaite (2010) *Do Fish Feel Pain?* Oxford University Press.

71. Seaweed in the UK food system: pitfalls and pathways to scaling up sustainably

N. Fallon^{1*}, X. Schmidt Rivera², L. Anguilano² and S.K. Paterson³

¹University of Greenwich, Natural Resources Institute, Medway Campus, Central Avenue, Chatham, ME4 4TB, United Kingdom; ²Brunel University London, College of Engineering, Design & Physical Sciences, Kingston Lane, London, Uxbridge, UB8 3PH, United Kingdom; ³Brunel University London, College of Business, Arts & Social Science, Kingston Lane, London, Uxbridge, UB8 3PH, United Kingdom; nf9964y@gre.ac.uk

Abstract

Within an increased global focus on the Blue Economy, seaweed has the potential to play a much larger role in the future of the UK food systems contributing to multiple environmental, economic, social and health benefits. Seaweed is currently used along the UK food chain as fertiliser, animal feed, in food processing, and as a low-carbon, nutrient dense food source. Mapping conducted using publicly available online sources identified 60 seaweed producers operating in the UK in 2021. These are predominantly small-scale harvesters and producers operating under a range of business models. However, with new enterprises entering the market involving larger scale industrial production and mechanised harvesting methods, the UK seaweed industry appears to be at the precipice of major changes. Scaling up the industry is seen as a priority for UK and devolved governments and an attractive sustainable investment option for venture capital. However, the potential impacts on the marine ecosystem and coastal livelihoods from an expected rapid expansion are currently unknown. In addition, regulation of the industry and the complex land and sea policy landscape is yet to be fully explored within the context of an expanded seaweed industry. Efforts have been expressed by government and industry bodies to ensure industry growth protects coastal communities and does not come at an environmental cost, but questions remain with regards to rapidly shifting power dynamics and industry pressures to deliver returns on investment in a global market. This paper will draw on examples from historical attempts to scale up seaweed production as well as other food-related industries to identify potential pitfalls for the industry to avoid if it is to find a path towards sustainable and responsible growth. More attention needs to be paid to the political economy of the seaweed industry, in particular the influence of powerful market actors and how this may impact the trajectory of the industry.

Keywords: algae, aquaculture, sustainability, political economy

Introduction

Seaweeds are rich in minerals and essential trace elements, high in fibre, low in fat and high in protein. The high nutrient content makes them appealing to health-conscious consumers as snack foods or food supplements, whilst hydrocolloids extracted from seaweed have properties that make them valuable as thickening agents and emulsifiers in the manufacturing of a range of processed foods such as ice-cream. In addition, seaweed is increasingly used as an alternative to petroleum-based inputs in agricultural value chains, as fertiliser and as animal feed, where it is attracting attention for its potential to reduce the Greenhouse Gas emissions (GHGe) caused by enteric fermentation in cows (Roque *et al.*, 2021).

Seaweed production has a consistently low impact across key environmental indicators (e.g. GHGe), can improve water quality by absorbing excess nutrients, and act as a carbon store (Gephart *et al.*, 2021). Furthermore, it offers an opportunity to support and strengthen coastal communities, through the

provision of jobs and broader economic through-flow (United Nations Global Compact, 2021). Given these elements, there is understandable interest in scaling up the seaweed industry in the UK, and this is changing the nature of the UK seaweed industry.

UK seaweed industry

Mapping conducted for this project identified 60 primary producers operating in the UK, with half of those involved in producing seaweed for human consumption in the form of high-value food products for both business and consumer markets. For businesses, seaweed is sold dried and/or milled in large quantities for the wholesale market and for use in the hospitality industry. Meanwhile, consumers can find their products such as seasonings, and snack products marketed under brands which emphasises the quality and provenance, artisanal, natural, and sustainable nature of their harvest and sold directly online or through retailers.

It is common for companies to adopt a 'sea-to-shelf' approach, with fewer specialised processors. Indeed, large-scale processing is recognised as a bottleneck for the industry (Phyconomy, 2021), and in the past year several companies have received large investments to scale up processing capacities (e.g. Scottish Government, 2021). This investment has come from both government grants and private investors and is being mirrored across the industry as production moves from wild harvesting towards large-scale seaweed farming to satisfy the demand for large volumes of biomass for industrial applications. Indeed, whilst currently most producers are small-scale wild harvesters, the number of farming enterprises is growing, with 9 commercial seaweed farms currently operating, and more in the process of applying for a marine licence (Capuzzo, 2021). Ambitions are high, with farm applications covering over 2 million m² submitted in the past 3 years in Scotland alone (Sustainable Inshore Fisheries Trust (SIFT) 2021), and feasibility studies in England identifying 58% of English waters covering 29,000 km², as suitable for kelp aquaculture (Marine Management Organisation, 2019). The nature of the businesses is also changing, with more 'blue-tech' start-ups entering on a wave of venture capital investment.

An uncertain regulatory landscape

The effects from this rapid expansion on the marine ecosystem and coastal livelihoods in the UK are unclear, and this is driving uncertainty in how the seaweed industry should be regulated within the complex land and sea policy landscape. Currently, prospective seaweed farmers and commercial harvesters must obtain a lease from the Crown Estate and a licence. The regulators responsible for the licensing of marine activities depends on whether the proposed activity is inshore (0-12 NM) or off-shore, with responsibility for in-shore licensing devolved across the four nations of the UK and off-shore regulated by the Marine Management Organisation, except in Scotland, where Marine Scotland has the authority across both (Woods *et al.*, 2017).

Applicants for a marine licence must demonstrate that their activities will protect the marine environment and will not detrimentally impact other coastal users. Depending on the scale and location of the proposed activity, applicants may have to undertake several different assessments, including a Habitats Regulations Assessment and Marine Protected Area Assessment that add time and cost to the process. The assessments for approval of seaweed farming are particularly difficult because, as a relatively recent venture, the nature and magnitude of the effects of seaweed farming in the UK on the ecosystem are unknown beyond modelling studies (Wilding *et al.*, 2021; Gephart *et al.*, 2021).

Evidence from China, the leading global producer of seaweed, shows how large-scale seaweed farming can have deleterious environmental effects through the escape of farmed species. The farmed species have been cultivated for desirable industrial traits such as faster growth rates and higher yields, and

Section 9

cross-breeding with wild species has left the latter vulnerable to disease and the impacts of climate change (Hu *et al.*, 2021).

A series of technical reports and feasibility studies (e.g. Capuzzo *et al.*, 2019) have been developed which provide recommendations to ensure that industry expansion doesn't compromise social and environmental goals in pursuit of economic growth. However, there are calls from across industry and academic groups to review the current regulations, which are seen as being over-cautious (Wilding *et al.*, 2019) and can add significant time and economic burdens to the application process which may deter potential investors (Capuzzo *et al.*, 2019). This hints at the tension between encouraging economic growth and protecting the environment.

Industry pressures in the context of a global seaweed industry

Although seaweed has been part of the culinary tradition of coastal communities around the UK for generations, it is not currently consumed in great quantities. There are ambitions to change that, in the UK and across Europe (Van den Berg *et al.*, 2021), but until that transition occurs, production increases will be searching for global buyers. This means the UK seaweed industry must be viewed in the context of the global seaweed market. Global seaweed production has risen rapidly over the past two decades, from 10.6 million tonnes in 2000 to 32.4 million tonnes in 2018, with East and South-East Asian countries dominating in seaweed cultivation (Food and Agriculture Organisation, 2020). There is growing investment from countries across Africa, North and South America and Europe as the unique potential for seaweed as a positive force to contribute towards Blue Economy ambitions and the Sustainable Development Goals is recognised (Van den Berg *et al.*, 2021).

Examples from history demonstrate how market forces can make or break an industry. In the 18th century, soaring demand for soda ash – produced by the burning of brown seaweeds and used in a range of industries – saw seaweed become an important and profitable endeavour for coastal communities in Scotland. This lasted until early 19th century when a cheaper alternative source of soda ash was developed, and the market dried up (Capuzzo, 2021). Meanwhile, international competition and oversupply depressing market value have also been cited as hampering attempts to industrialise seaweed production in Canada and Japan respectively (McHugh, 2003).

The competitive nature of the global seaweed industry exerts external pressures on the UK industry to find ways to gain a competitive advantage, such as by driving down production and harvesting costs through mechanisation and economies of scale (*ibid.*). However, scaling up production through large-scale seaweed farming, thereby following down the 'old path' of consolidation and intensification seen in agriculture and aquaculture, may have unintended social and environmental consequences. The next section will consider examples from two sectors: dairy farming and salmon farming.

Lessons from the UK food system

Dairy farming in the UK has changed considerably over the past two decades and this has had social and economic impacts on rural communities. The number of dairy producers in the UK fell by 67% between 1995 and 2020 (Uberoi, 2021) as the industry consolidated into fewer, larger farms, and increased the intensification and mechanisation of production (Gonzalez-Mejia *et al.*, 2018). The mechanisation of production reduced the need for farm labour, with the result that smaller farms now tend to employ more workers per unit area than larger farms, and they are also usually more embedded within the community (Winter and Lobley, 2016).

In comparison, the expansion of the salmon industry in Scotland did initially provide employment to local workers, an income stream to local suppliers and service providers within the industry and related industries, as well as an economic lift to the local area's shops, schools, housing, transport and services (Ellis *et al.*, 2016). However, consolidation in recent years has resulted in an industry dominated by a small number of internationally owned businesses leading to a perceived reduction in local employment opportunities, and environmental concerns (Billing *et al.*, 2021). Indeed, whilst consolidation improved production metrics (e.g. yield), damaging environmental impacts such as eutrophication and increased susceptibility to disease outbreaks became much more prevalent (Ellis *et al.*, 2016).

What could sustainable and responsible growth look like?

Recognising the issues outlined above, the UN Global Compact (2021) and the FAO (2020) reference the industrialisation of agriculture and fisheries respectively as models the seaweed industry must avoid emulating. There is a growing literature offering alternative pathways to encourage the growth of a sustainable and responsible seaweed industry. Possible areas worth further exploration include adopting innovative business models such as co-operatives and partner-farmer models (UN Global Compact, 2021) and adopting a circular economy approach to development (Van den Burg *et al.*, 2019). Other options include integrating or co-locating seaweed with other forms of aquaculture (SIFT, 2021), or compensating seaweed producers for organising their activities in ways that provide ecological benefits (Hu *et al.*, 2021), in a similar manner to the Environmental Land Management scheme in the UK (Department for Farming, Environment and Rural Affairs, 2021).

Finally, including a requirement for applicants to gain a social licence could offer a way to ensure community interests are included throughout the design and application process. Billing *et al.* (2021) spoke to community members in Scotland and France who described the provision of local jobs, community embeddedness, and accountability as critical factors for acceptable operations. In Scotland, the community members were distrustful of large corporations and expressed a preference for small scale producers operating as co-operatives or community focused enterprises. However, crucially, stakeholders within the seaweed industry surveyed as part of the same study argued that to grow in a way that aligned with the desires of local community members would not be economically viable (*ibid.*).

Thus, it is important to recognise that the interests of coastal communities and seaweed producers may not be compatible (Billing *et al.*, 2021). In those circumstances, how should the industry proceed? And how is it likely to develop? For regulators, there needs to be an awareness of the potential conflict between protecting the marine environment and supporting the growth of the Blue Economy (Scottish Association for Marine Science, 2020), and clarity over the priorities and decision-making processes. However, one area that has received less attention is the political economy of the seaweed industry, and in particular, the different stakeholders seeking to influence the trajectory of development.

The political economy of the UK seaweed industry: a contested landscape

Viewing the seaweed industry through a political economy lens allows the consideration of the relationships between different actors involved as well as a framework to identify potential obstacles to change by questioning who currently controls and benefits from the present manifestation (De Schutter, 2019). Corporations dominate the global food system, and they are turning their attentions to seaweed. The conglomerates Cargill and DuPont have both launched their own 'Sustainable Seaweed' initiatives focusing on increasing production in the Global South, whilst Nestlé is using the crop in their plant-based seafood and egg products (Financial Times, 2022). In a market economy, these actors wield significant influence in the creation of standards and regulations that have ramifications globally, not just in their country of operations.

Section 9

In the UK, the entrance of companies with global ambitions and venture capital investment brings with it pressure to deliver that may drive producers to seek efficiencies through scaling up production and reducing operating costs, and persuade regulators to facilitate economic growth through a more permissive regulatory landscape. In addition, as seaweed has gained political and economic importance, numerous indirect actors have emerged that seek to influence the developing seaweed industry in the UK. Mapping for this project identified a host of industry groups, philanthropic foundations and public-private partnerships who have entered the discourse arena in recent years. These different groups are conducting research, publishing reports, or otherwise seeking to influence policy and regulations in ways that further their own, potentially conflicting, interests. Regulators need to be aware of and account for the power imbalances and conflicting interests as the industry grows to ensure it is not steered down the 'old path'.

Conclusions

This article has identified tensions between economic, social and environmental goals of the development of the seaweed industry. How the inevitable trade-offs are managed will go a long way to determining the long-term sustainability of the industry. If the economic interests of powerful private actors are allowed to dominate, there are concerns that seaweed farming could follow suit of other commodities in the food system. However, if social and environmental objectives are given greater weighting, scaling up of seaweed industry in the UK has the potential to model a path for others to follow.

Acknowledgements

Supported by UKRI Transforming UK Food Systems Strategic Priorities Fund as part of the UK Food Systems CDT.

References

- Billing, S.L., Rostan, J., Tett, P. and Macleod, A. (2021). Is social license to operate relevant for seaweed cultivation in Europe? *Aquaculture*, 534, p.736203.
- Capuzzo, E., Mengo, E., Kennerley, A. (2019). Seaweed farming feasibility within the Dorset and East Devon FLAG area. Report 1 – Potential species, farming methods, end uses and benefits. Cefas Contract C7747, European Maritime and Fisheries Fund (EMFF) grant number ENG2805
- Capuzzo E. (2021) Seaweed Industries and Products in the UK: A Brief Review (Chapter-14); In: A. Ranga Rao and G. A. Ravishankar (Eds.) *Sustainable Global Resources of Seaweeds: Industrial Perspectives; Volume-I: Bioresources, cultivation, trade and multifarious applications*; Springer Nature (in press) https://doi.org/10.1007/978-3-030-91955-9_14
- De Schutter, O. (2019) The political economy approach to food systems reform. *IDS Bulletin*. 50(2) pp.13-26. doi:10.19088/1968-2019.115
- Department for Farming, Environment and Rural Affairs (2021) Environmental Land Management Scheme Overview. Available at: <https://www.gov.uk/government/publications/environmental-land-management-schemes-overview/environmental-land-management-scheme-overview>.
- Ellis, T., Turnbull, J.F., Knowles, T.G., Lines, J.A. and Auchterlonie, N.A. (2016). Trends during development of Scottish salmon farming: An example of sustainable intensification?. *Aquaculture*, 458, pp.82-99.
- Financial Times (2022) Can help help? Investors eye sustainable harvest from seaweed. By Patrick Temple-West, 03/02/2022. Available at: <https://www.ft.com/content/52e6ed83-f2ef-4391-9918-9734649bd4e4>.
- Food and Agriculture Organisation (2020) *The State of World Fisheries and Aquaculture 2020. Sustainability in action*. Rome, Italy.
- Gephart, J.A., Henriksson, P.J., Parker, R.W., Shepon, A., Gorospe, K.D., Bergman, K., Eshel, G., Golden, C.D., Halpern, B.S., Hornborg, S. and Jonell, M. (2021) Environmental performance of blue foods. *Nature*, 597(7876), pp.360-365.

- Gonzalez-Mejia, A., Styles, D., Wilson, P. and Gibbons, J. (2018) Metrics and methods for characterizing dairy farm intensification using farm survey data. *PLoS one*, 13(5), p.e0195286.
- Hu, Z.M., Shan, T.F., Zhang, J., Zhang, Q.S., Critchley, A.T., Choi, H.G., Yotsukura, N., Liu, F.L. and Duan, D.L. (2021) Kelp aquaculture in China: a retrospective and future prospects. *Reviews in Aquaculture*, 13(3), pp.1324-1351.
- Marine Management Organisation (MMO) (2019) Identification of Areas of Aquaculture Potential in English Waters.
- McHugh, D.J. (2003) A guide to the seaweed industry. FAO Fisheries Technical Paper. No. 441. Rome.
- Phyconomy (2021) Seaweed startups in 2021: an ecosystem emerges. Available at: <https://phyconomy.net/state-of-the-industry-2022/startups/>.
- Roque, B.M., Venegas, M., Kinley, R.D., de Nys, R., Duarte, T.L., Yang, X. and Kebreab, E. (2021) Red seaweed (*Asparagopsis taxiformis*) supplementation reduces enteric methane by over 80 percent in beef steers. *PLoS One*, 16(3), p.e0247820.
- Scottish Association for Marine Science (2020) Strategy to secure healthy and sustainable oceans. Available at: <https://www.sams.ac.uk/t4-media/sams/pdf/Digital-Sams-Strategy-Report-2020---2025.pdf>.
- Scottish Government (2021) Marine Fund Scotland 2021-2022: beneficiaries. Available at: <https://www.gov.scot/publications/marine-fund-scotland-2021-2022-beneficiaries/>.
- Sustainable Inshore Fisheries Trust (SIFT) (2021) Seaweed cultivation in Scotland: A guide for community participation in seaweed farm applications, Available at: <https://sift.scot/wp-content/uploads/2021/03/SIFT-Seaweed-Guide.pdf>
- Uberoi, E. (2021) UK dairy industry statistics. Commons Library Research Briefing, 9 September 2021, No. 2721, House of Commons Library
- United Nations Global Compact (2021) Seaweed as a Nature-Based Climate Solution: Vision Statement. New York: United Nations
- Van den Burg, S.W.K., Dagevos, H. and Helmes, R.J.K. (2021). Towards sustainable European seaweed value chains: a triple P perspective. *ICES Journal of Marine Science*, 78(1), pp.443-450.
- Wilding, C. Tillin, H. Corrigan, S.E. Stuart, E. Ashton I.A. Felstead, P. Lubelski, A. Burrows, M. Smale D. (2021). Seaweed aquaculture and mechanical harvesting: an evidence review to support sustainable management. Natural England Commissioned Reports. Natural England Report NECR378.
- Winter, M. and Loble, M. (2016) Is there a future for the small family farm in the UK? Report to The Prince's Countryside Fund, London: Prince's Countryside Fund.
- Wood, D., Capuzzo, E., Kirby, D., Mooney-McAuley, K. and Kerrison, P. (2017). UK macroalgae aquaculture: What are the key environmental and licensing considerations? *Marine policy*, 83, pp.29-39.

Both authors have worked within SBP-N's work package dedicated to Responsible research and innovation (RRI). In line with the tenants of RRI, we have engaged the research community in a shared reflexivity regarding the ambitions and the social and environmental situatedness of research. In the following, we present and reflect upon the findings of a pilot study conducted with researchers within the consortium over a one-year period. This consisted of qualitative interviews and reflexive RRI dialogues and feedback-sessions. We begin by expanding on the methodology and theoretical framework of our pilot study, before moving on to the findings themselves. These are categorized as 1. Developing a new Norwegian industry, 2. Barriers to success, 3. Disagreements on sustainability, and 4. Necessary frameworks for a viable industry. In closing, we attempt to draw some preliminary conclusions based on this work and indicate further avenues for research both within our current project and for future efforts.

Methods and theoretical framework

RRI has emerged in recent years as a science policy framework and a vital part of large research and innovation projects. RRI seeks to align technological innovation with broader social values, and to support the institutional decisions concerning the goals of research and innovation in conditions of uncertainty and ambiguity. The underlying rationale is that science and technology are socially, ethically, and politically entangled and that they can therefore have far-reaching, uncertain, and unpredictable social consequences which necessitates continuous assessment. According to the EU therefore, the aim is to integrate into research

an approach that anticipates and assesses potential implications and societal expectations with regard to research and innovation, with the aim to foster the design of inclusive and sustainable research and innovation. (EU, 2022)

Concretely, RRI can be conceptualized in four separate but interlinked ambitions: anticipation, reflexivity, inclusion, and responsiveness (Stilgoe *et al.*, 2013). In this study, we are concerned with the first two ambitions. By anticipation, projects are meant to predict and shape desirable futures as well as to disentangle present-day hypes from realistic futures. The aim of reflexivity refers to fostering a common sense of awareness in research and innovation environments regarding their activities and to be able to critically think through one's commitments and assumptions. Consequently, working on RRI we have been an integrated part of the Seaweed Biorefinery Platform and the platform's activities. In so doing, we have mapped the research taking place and conducted semi-structured interviews with consortium researchers across institutions. We expand on interviewing below. Subsequently, findings and observations from the interviews were communicated back to the consortium both informally during project meetings and in two separate discussion and dialogue events wherein we took further notes.

Interviews

Fourteen interviewees were recruited internally in the consortium. Characteristics of our interviewees are presented in Table 1. Our interview study was reported to the Norwegian centre for research data (NSD) and all interviewed parties gave their written informed consent to partake. The interviews were conducted by GK and took place either face to face at the interviewee's place of work, or via a digital medium (e.g. Zoom) due to geographical distance as well as ongoing Covid-19 restrictions. The interviews were audio recorded. We followed a modified version of the theoretical framework of epistemic interviewing proposed by Brinkmann (2007). Epistemic interviewing differs from what Brinkmann regards as the more common form of interviewing in sociology and psychology and which he terms doxastic interviews. In the doxastic interview, Brinkmann reasons, the main objective is to inquire

Section 9

into and gain knowledge of the interviewee's thoughts, feelings, and experiences. This type of interview is typically marked by a distance between the interviewer and the interviewee, where the interviewer wields the power of interpretation over the subject's story.

In contrast to this, epistemic interviews as conceived by Brinkmann reject such a distance as well as any psychologizing angle. Drawing influence from the Socratic dialogues, Brinkmann argues that the aim of an epistemic interview is knowledge creation, perhaps also phrased as increased awareness of knowledge, not a bearing of the soul. Moreover, in this dialogic process, the interviewer necessarily becomes a visible and contributing partner rather than an external or supposedly objective interpreter. We agree with Brinkmann that an interview aiming at knowledge creation was best suited for the type of topics explored. Moreover, in keeping with the ideals of RRI, we did not wish to remove ourselves as partners in the research. Subsequently, and as is customary in semi-structured interviews, we had a rough interview guide with topics that we wanted to cover. However, the interview most often took the shape of a conversation between colleagues leaving room for additional questions whenever relevant, follow-up inquiries and giving both the interviewed party and the interviewer room to freely expand on questions.

Our covered topics included the researchers' everyday work, their understanding of and hopes for the ultimate goals of their research and the perceived challenges to this. We further discussed industrialization and markets for seaweed, potentials and barriers, the relationship between industry and research, other stakeholders, the public, and environmental concerns. Ultimately, we wished to gain an understanding of how researchers viewed their own activities and which barriers to success they could identify based on their own experiences. In so doing, we explored conditions, both internal and external to research, for industry development. Through the subsequent feedback and dialogue sessions with the consortium, we were able to include the points of views and insights of more people and to encourage reflection and more in-depth engagement with the topics, aiding in creating knowledge and perhaps an alignment of views within our group, while clarifying diverging visions.

Findings

Sustainability, understood as a three-fold concept encompassing social, environmental, and financial dimensions (Purvis *et al.*, 2019), stood out throughout the interviews as both main motivators behind the research, its hoped-for outcomes as well as key barriers to success. In the following we go through some of the main issues that were identified.

Table 1. Interviewee characteristics.

Employment sector	Academia	6
	Applied Research	8
Career track, level of experience	Early career researcher	3
	Senior researcher/professor	9
	Lab technician	2
Gender	Female	8
	Male	6

Developing a new Norwegian industry.

Most of the research stakeholders agreed that their ultimate aim of working on the SBP-N was to help develop a new national industry. Throughout the interviews, there was wide agreement that a seaweed cultivation industry would be environmentally sound.

Seaweed is better than a lot of other products because there's no need for fertilizer, no land, no watering. It doesn't compete with other things.

Researchers were motivated by different foci, however, with some emphasising social issues such as employment along the coast and others hoping for a transition to a so-called 'blue economy', more vegetable based and local nutrition, as well as out phasing the petroleum industry. Whereas a few researchers had great hopes for seaweed for human consumption, others were more sceptical, referencing poor nutritional value as an issue. In their opinion, the cultivated seaweed could be better used in animal feed or other usages such as in creating synergies with other aquaculture (e.g. fish farms) or as a replacement for inorganic materials. The possibility of carbon capture was also mentioned by those who were most optimistic. In general, younger researchers were more hopeful of the potential of this emerging industry than were their older counterparts. More experienced researchers seemed more cautious in their predictions of the future, implying that there was a certain degree of hype driving the seaweed R&D policy. Their research motivation was mainly an interest in seaweed chemistry or fundamental research.

Barriers to success

The key barrier, which was identified in most interviews, was the market. The products currently extracted from Norwegian seaweed cultivation were unanimously described as very expensive necessitating therefore either a large scale-up of operations to lower the price, or the development of luxury products for which there might be a high willingness to pay. Crucially however, there is not a clear or large market demand in Norway for seaweed products beyond what is currently extracted from harvested seaweed. Some therefore wondered if the efforts had not begun from the wrong end, focussing on research and development prematurely, rather than defining product needs or creating a demand before technology development. A related issue was that of regulation, which emerged as a significant decisive condition for the industry's success or failure. The Norwegian food safety authority was described as having little experience with seaweed for human consumption and consequently, their regulations were perceived as unclear. This limits product creation and marketing, affecting entrepreneurs and researchers alike.

Lesser barriers included potential conflicts with the fishing industry and insecurities about local environments, similar to conflicts already occurring in some locations due to fish farming or seaweed harvesting. As one researcher expressed it 'By building these structures in the ocean, it will affect the local ecosystems'. Indeed, the effects of this are still unknown. Concerns were also raised about the potential for so-called NIMBYism (dos Santos, 2021) where coastal communities might not want cultivation facilities to encroach on their coastlines for aesthetic and cultural reasons, however this remained a hypothesis.

Disagreements on sustainability

Whereas there had been an apparent unanimity across the interviews concerning the environmental sustainability of seaweed cultivation, concerns began to surface when the issue was raised in the dialogue sessions with the same respondents and the broader consortium. Some pointed out the problems of scale-up, which would increase transportation and infrastructure needs, the use of materials in general and plastics in particular – for instance in the ropes used for cultivation. Increased attention was also

Section 9

brought to possible mismatches between local ocean and fishing practices and the installation of large industrial facilities along the coastline. There was, moreover, general discord regarding the potential for seaweed to replace environmentally problematic foodstuffs like the import of soy, and possibilities for carbon capture. Thus, whereas the general enthusiasm about seaweed as material and the development of better refinement methods remained high, there was less of an agreed upon optimism for the future in the research community as compared to that expressed in the media and seemingly among entrepreneurs.

Necessary frameworks for a viable industry

Many of the applied researchers in the platform have experience working collaboratively with industry and commercial partners and saw these partnerships as fruitful and unproblematic. For those employed in basic research positions, this relationship sometimes appeared less straightforward. Some indicated that the industry appeared secretive and unwilling to share their research and development as freely as academic institutions did. Moreover, differences in timeframes were pointed out as a challenge, where commercial agents may want fast results. For some researchers, these difficulties rose to the level of experiencing that they had to downplay potential barriers to industry development or difficulties within the research, in order to appease funders and secure the continued financing of their work. Better understanding of the different sectors therefore emerged as a point for further investigation. As did the need for communication with the public and with the relevant regulatory agencies.

Conclusion and directions for further work

The economic, social and environmental dimensions of sustainability form the framework for this pilot study of the emerging Norwegian seaweed farming industry. The findings of our pilot study and in-project RRI work indicate that the main barriers to successful seaweed industry upscaling in Norway conform in large part to those identified in the international literature. This includes area conflicts (Campbell *et al.*, 2019), general aesthetic concerns and social acceptance (Hasselstrøm *et al.*, 2018), as well as understanding and mitigating environmental effects and risks of the industry – such as plastic pollution (Campbell *et al.*, 2019). Furthermore, the market for seaweed is underdeveloped compared to for instance the Asian market, and there is confusion concerning what might be the best commercial products of such an industry as well as their public desirability. Product creation and market growth therefore stand out as necessary steps to secure a viable business.

Visions and ambitions are not shared uniformly amongst researchers in the field. We found that the research community was split between hoppers, envisioning a thriving seaweed business in the near future, and those who regarded the commercial potential presented by industry and researchers as unfounded hype. This disagreement was particularly strong concerning the possibility of a large-scale production of seaweed-based food. There was more faith in the future for animal feed, across this divide. Likewise, there was more agreement on the potential for positive impact on local communities and synergies with fish farming in integrated multi-trophic aquaculture (Ellis and Tiller, 2019). A preliminary conclusion may therefore be drawn that the successful development and upscaling of Norwegian seaweed farming requires close cooperation between industry, research, and public authorities. The next step of our work is to conduct interviews with industry stakeholders and regulatory authorities. This will enable a fuller assessment of the question whether the visions for future large-scale aquaculture industry in Norway is expression of reasonable hope or expression of hype mainly to achieve public funding.

References

- Brinkman, S. (2007). Could interviews be epistemic? An alternative to Qualitative opinion polling. *Qualitative inquiry* 13(8):1116-1138.
- Campbell I., Macleod A., Sahlmann C., Neves L., Funderud J., Øverland M., Hughes A.D. and Stanley M. (2019) The environmental risks associated with the development of seaweed farming in europe – prioritizing key knowledge gaps. *Frontiers in Marine Science* 6: 107. <https://doi.org/10.3389/fmars.2019.00107>
- Duarte, C.M., Bruhn, A. and Krause-Jensen, D. (2021). A seaweed aquaculture imperative to meet global sustainability targets. *Nature Sustainability*. <https://doi.org/10.1038/s41893-021-00773-9>
- Ellis, J. and Tiller, R. (2019). Conceptualizing future scenarios of integrated multi-trophic aquaculture (IMTA) in the Norwegian salmon industry. *Marine Policy* 104: 198-209. <https://doi.org/10.1016/j.marpol.2019.02.049>.
- Hasselström L., Visch W., Gröndahl F., Nylund G.M. and Pavia H. (2018). The impact of seaweed cultivation on ecosystem services – a case study from the west coast of Sweden. *Marine Pollution Bulletin*. 133: 53-64. <https://doi.org/10.1016/j.marpolbul.2018.05.005>.
- Hegnar, M (2021) Snart blir dette en stor, ny industri. *Finansavisen*, 19.11.2021. Accessible at: Alginor, Arctic Seaweed, Dupont Nutrition Norge og Tekslo Seafood er blant selskapene som satser på tang og tare i Norge, og har fått med seg Jakob Hatteland, Borregaard og Orkla Ocean på laget | *Finansavisen*.
- Omsted, G. (2021). Tare dyrking kan gjennomføres bærekraftig og med få negative påvirkninger på miljøet. *Forskning.no* 24.03.2021. Available at: Tare dyrking kan gjennomføres bærekraftig og med få negative påvirkninger på miljøet (forskning.no).
- Purvis, B., Mao, Y. and Robinson, D. (2019). Three pillars of sustainability: in search of conceptual origins. *Sustainability Science* 14: 681-695. <https://doi.org/10.1007/s11625-018-0627-5>
- Dos Santos, J.R. (2021). How im(Moral) is the ‘Nimby’ stand? Elements to the Ethics of ‘environmental’ Conflicts. In: Abrunhosa M., Chambel A., Peppoloni S., Chaminé H.I. (eds.) *Advances in Geoethics and Groundwater Management: Theory and Practice for a Sustainable Development*. *Advances in Science, Technology & Innovation*. Springer, Cham. https://doi.org/10.1007/978-3-030-59320-9_16
- Stilgoe, J., Owen, R. and Macnaghten, P. (2013). Developing a framework for responsible innovation. *Research Policy* 42 (9): 1568-1580. <https://doi.org/10.1016/j.respol.2013.05.008>.
- White, W.L. and Wilson, P. (2015). World seaweed utilization In: B. K. Tiwari and D.J. Troy (eds.) *Seaweed Sustainability. Food and Non-Food Applications*. Academic Press, London, pp. 7-25. <https://doi.org/10.1016/B978-0-12-418697-2.00002-7>
- EU Responsible research & innovation. Available at: <https://ec.europa.eu/programmes/horizon2020/en/h2020-section/responsible-research-innovation>.

73. Ethics through technology – individuation of farmed salmon by facial recognition

M.F. Trøite* and B.K. Myskja

NTNU – Norwegian University of Science and Technology, Trondheim, Norway; matilde.ftroite@ntnu.no

Abstract

One fundamental element in our moral duties to sentient animals, according to some central ethical approaches, is to treat them as individuals that are morally significant for their own sake. This is impossible in large-scale industrial salmon aquaculture due to the number of animals and their inaccessibility under the surface. Reducing the numbers to ensure individual care would make salmon farming economically unfeasible. Technology may provide alternative solutions. FishNet is an emerging facial recognition technology which allows caretakers to monitor behaviour and health of individual fish. We argue that FishNet may be a solution for ensuring adequate animal welfare by overcoming current obstacles to monitoring and avoid stress caused by physical interaction with humans. This surveillance can also expand our knowledge of farmed fish behaviour, physical and social needs. Thus, we may learn to perceive them as fellow creatures deserving of individual care and respect, ultimately altering the industry practices. However, the technology may serve as a deflection, covering up how individual salmon are doomed to adverse and abnormal behaviour. This may strengthen a paradigm of salmon as biomass, preventing the compassion required for moral reform, where the understanding of fish welfare is restricted to the prevention of suffering as a means to ensure quality products. Whether FishNet will contribute to meet the moral duty to recognize and treat farmed fish as individuals or not, requires reflection upon the ethical dualities of this technology, simultaneously enabling and constraining our moral perceptions and freedom to act. We will discuss the conditions for realizing the ethical potential of this technology.

Keywords: animal welfare, artificial intelligence, fish farming, moral status, technological mediation

Introduction

Norway is the world's largest producer of farmed salmon with over 1,3 million tons slaughtered for food every year (Statistics Norway, 2020). There are up to 200,000 farmed salmon in each fish pen, not including other species introduced to remove salmon lice, so-called cleaner fish (Erkinharju *et al.*, 2021). Needless to say, this is an intensive, large-scale industrial form of animal husbandry. And with that, many challenges arise in ensuring good animal welfare to each individual fish.

One fundamental element in our moral duties to sentient animals, at least within a deontological approach, is to treat them as individuals that are morally significant for their own sake (Regan, 2004; Korsgaard, 2018). But this seems impossible in large-scale industrial salmon aquaculture, due to the number of animals and their inaccessibility caused by constant movement under the surface of the water. In addition, there is a psychological barrier not encountered with most other animals we regularly interact with: fish are silent, expressionless, and cold. However, there is a rapidly growing technology area for 'smart fish farming' employing machine learning to improve the quality and efficiency of the activities (Yang *et al.*, 2021: 66). Some of these technologies may play a role in enabling ethical improvement of the farming practices.

FishNet is such a technology that is still under development. Its goal is to enable caretakers to monitor behaviour and health of individual fish through facial recognition (Mathisen *et al.*, 2020), which in turn will make possible early interventions solving individual welfare problems. Thus, this technology has the potential to solve some of the main welfare challenges within this industry. However, 'welfare' is largely an ethical and perspective-dependent term and viewing and treating animals as individuals that are morally significant for their own sake is not necessarily a mere welfare concern. We follow Kiran (2015) in holding that technological solutions have the structure of simultaneously enabling and constraining our moral perceptions and freedom to act and argue that shedding light on this 'two-sidedness' of technological mediation gives us a breadth of perspective which is important when deciding if and how to implement certain technologies as solutions to existing problems and challenges that are not solely technical.

In this paper we take a closer look at this 'two-sidedness' of technological mediation and discuss conditions for realizing the ethical potential of technologies such as FishNet within salmon aquaculture. We argue that FishNet can enable caretakers to view and treat salmon as individuals that are morally significant for their own sake, but it can also become merely a tool for minimizing loss and increase the profit margin through further instrumentalization of the individual fish.

Norwegian salmon aquaculture – profit and welfare

Economically the Norwegian salmon farming industry is very successful, but it is also an industry with generally recognised serious environmental and animal welfare problems. As mentioned in the introduction, some of the welfare problems may be explained by a combination of the inaccessibility of salmon, physically and emotionally, and our limited knowledge regarding their interests and needs. But when this is combined with large-scale industrial husbandry systems, it makes it that much harder to ensure the wellbeing of each animal. Every year over 50 million farmed salmon die before slaughter due to poor welfare (Veterinærinstituttet, 2020). Lice infection and – paradoxically – lice treatment is viewed as two of the main reasons for the existing welfare problems and premature deaths. The current lice treatments include chemical, mechanical and temperature-based treatments. All are painful and cause significant stress for the fish. Conservative treatments, especially cleaner fish feeding on the lice, are inefficient and harmful to these species. However, many welfare problems and premature deaths are also the result of deformation, other diseases, and poor adaption-ability to this form of husbandry (Veterinærinstituttet, 2020). Being allowed to continue and expand despite these unsolved welfare problems arguably is part of the reason for this industry to be so profitable.

What does it mean to treat an animal as an individual?

Korsgaard (2018:148) argues that animals should be included in the moral community because 'we recognize them as fellow creatures with a good of their own, just like ours.' We will take this as our point of departure, using a restricted interpretation of this principle where unwarranted infliction of pain and prevention of living according to species-specific and individual needs are morally wrong, but where, contrary to Korsgaard's position, painless killing is allowable. This is in keeping with a common morality interpretation of the Norwegian Animal Welfare Act (AWA) understanding that fish are sentient animals that are to be treated good independently of their instrumental value for humans (AWA, 2009: §§2 and 3).

According to Korsgaard's account, an animal has moral standing if it is sentient to the extent that it is aware of and pursues its own good, and by that deciding its own ends. Humans and animals are similar in the sense that both 'are creatures *for* whom things can be good or bad, and [...] we each take our own good to be good absolutely' (Korsgaard, 2018: 147). In this respect, an animal is an end in itself and

Section 9

worthy of individual respect. In deciding how to act, it means that the good of an animal should be taken into account regardless of whether such consideration serves another end or not. On this relational account, which accords well with a common moral understanding, we have a special responsibility towards animals in our care, that is animals whose wellbeing is totally dependent on our actions and choices. At the bare minimum one should strive to ensure that these animals do not suffer, and at best, has a life worth living from the animals' own point of view.

Knowing that approximately 50 million salmon will suffer and die due to the existing unsolved welfare problems, while the industry continues to expand, salmon are clearly not treated as individuals that are morally relevant for their own sake, and the industry fails in their duties of care. The industry's description of farmed fish as 'biomass' and prematurely dead fish as 'wastage' (Saue, 2018) indicates that this is not only a problem of poor practice but of a lack of adequate moral perception.

Facial recognition of salmon

There is, however, a demand from both the government, the citizens and the industry for improvement, resulting in a wide range of research efforts focusing on improving the welfare of farmed fish through new methods and technologies. One such promising technology still under development is FishNet, a technology that employs so-called deep learning to identify salmon the same way it has been successfully used to identify humans. This model has been trained by using images captured from a video of farmed salmon to make the model identify individual salmon through facial recognition. The research is still in its initial stages and has not been applied to real-life circumstances. Under ideal conditions, it achieves a false positive rate of 1% and a true positive rate of 96% (Mathisen *et al.*, 2020).

Current methods of individual salmon tagging and tracking rely on physical interaction with the fish; a process that causes stress and may physically harm the fish. In addition, they are inaccurate since these manual inspections and measurements are based on a few individual fish which are used to estimate the status in the pens. By being able to track an individual salmon throughout its lifespan, the facial recognition technology makes it possible to treat salmon only when the need arises. This means that one will delouse only the individuals that actually suffer from lice, thereby preventing unnecessary harm to healthy salmon (Mathisen *et al.*, 2020). Likewise, individual fish suffering from viral diseases or show abnormal behaviour and other symptoms of distress may be removed from the pen and given adequate care or be slaughtered. The latter hardly seems to be in accordance with taking fish to be ends in themselves, but that is how farm animals with untreatable diseases are relieved of their suffering.

Regardless of how this solution to animal suffering is evaluated, it is clear that the facial recognition technology, if successful, will provide a basis for solving some of the major welfare problems in salmon farming. And with the possibility to monitor individual feeding behaviour, social behaviour and detect diseases, we can gain more knowledge about the abilities, interests and needs of the fish, which might establish a whole new non-invasive and efficient ground for good operation within the salmon industry. In short, this appears as an ethical technology ensuring the individual treatment of a species that usually is denied such consideration.

The two-sidedness of technological mediation

However, the picture is not quite that simple. Although technology can solve what is regarded as welfare challenges within this industry, it does not necessarily mean that it will ensure good welfare for these animals. Nor does it automatically ensure that these animals are seen and treated as individuals that are morally significant for their own sake.

‘Welfare’ is largely an ethical and perspective-dependent term. As Lien (2015: 140) points out with reference to other studies, ‘what appears as a fact is also sustained by social practices, including legal practices.’ And in everyday aquaculture, ‘good animal welfare’ is translated to ‘acceptable welfare’ which is dependent on which considerations and values that comes into play. In regard to the debate on animal welfare science, this debate is often characterized as having three basic paradigms. Following Gjerris (2014), we can describe the first paradigm as concerned with health and normal biological functioning. This paradigm is focused on quantitative indicators such as life expectancy, growth, behaviour patterns and physical status of the body. The second paradigm is directed at the experiences of the animal. Here one seeks to register whether the animal has experiences that are pleasurable or painful for them. The concern here is not only with directly measurable indicators as in the first paradigm. Undernourishment and fear are examples of negative states, and satisfaction and contentment of positive ones. The third paradigm is centred on the animal’s ability to live in accordance with its inherent nature and engage in behaviour that is specific for the species to which it belongs, in an environment suitable for this behaviour (Gjerris, 2014: 519).

We should follow the third paradigm, given Korsgaard’s argument that we have an obligation to promote the animal’s own good. Current salmon farming practices are far from that ideal. The principle of intensive production excludes the possibility for farm animals to unfold and experience their nature, their abilities and interests if it is not conducive for production. However, in a non-ideal world, we should not let the best be the enemy of the good. If technologies such as FishNet facial recognition can help realizing the first paradigm, bring us towards the second, and keep the third as the long-time goal for a future reformed salmon farming, we should not reject the idea. Technology may be a resource for altering the moral perception of the producers, helping them to realise the moral obligations we have for the salmon as our fellow creatures.

Unlike other moral technologies, such as speed bumps and the Schiphol airport pictures of a fly etched onto the urinals to reduce spill, technologies such as FishNet do not force or nudge us to be moral. It opens a space for moral perception and reflection inaccessible to us before, but it also enables a potential further alienation from the moral challenges raised by encounters with animals as fellow creatures. This draws attention to the relevance of the attitude towards, and understanding of, these animals which can enable or disable the adequate response and responsible treatment. In her anthropological study of the Norwegian fish farming industry, Lien (2015) argues that responsible treatment of salmon in fish farming is more than learning or accepting that fish are sentient creatures that can feel pain. It is also about care and compassion, which develops in this interactive and relational practice between the fish and us humans. This contributes to the understanding and development of what a farmed salmon is or what it can be, as well as what makes humans responsible and response-able. This means that if individualizing facial recognition technologies enable us to see and learn more about the interests and needs of the salmon, it might establish a whole new ground for such response and care towards these animals. Thus, we may learn to perceive them as fellow creatures deserving of individual care and respect, instead of as an economically valuable biomass. And with the possibility to give these salmon individual care if needed – coupled up with knowing what is good and bad for these animals – one can argue that responsibility increases proportionally with this technologically mediated interaction. This can also contribute to broaden the welfare parameters to include positive welfare, which in turn might prompt changes to the husbandry system itself, opening the possibilities of a reformed salmon aquaculture.

However, one might question if knowledge gained through monitoring these animals in this type of husbandry system can give us the correct or necessary knowledge regarding the interests and needs of farmed salmon. Intensive, large-scale industrial husbandry systems do not allow the animals to display their complex nature. The animals are therefore prone to adverse and abnormal behaviour. This means that if FishNet is only fed imagery from salmon kept in aquaculture cages where the input to the machine

Section 9

learning system takes existing conditions as the standard for adequate salmon welfare, it will not be able to register what is (un)normal or (un)natural salmon states. Further, FishNet is developed on the basis of an already predetermined focus on what is regarded as welfare problems from the perspective of the industry. But solely focusing on the observable, functional, and physical phenomena of welfare indicators, can blind us to individual, positive welfare requirements (Harfeld et. al., 2016). Without reflection on how we can and should relate to our fellow creatures and under which circumstances this is made possible, this type of husbandry system and the already predetermined welfare parameters from the perspective of the industry might result in FishNet normalizing the existing conditions. Considering that the current state is highly criticized from a wide range of instances, including the annual status report from the leading research institution of the field (Veterinærinstituttet, 2020), the standard determined as basis for the machine learning process will be crucial. If the developers use the current fish farming standards for animal welfare as basis, FishNet may end up serving as a deflection, covering up how individual salmon are doomed to adverse and abnormal behaviour. In a worst case scenario, this technology may reinforce and strengthen a paradigm of salmon as biomass, restricting the compassion required to respond in a way that expresses a view of these animals as morally significant for their own sake.

According to Kiran (2015), technologies have this kind of mediating function reshaping us as humans, as well as the world we inhabit. This technological mediation is fundamentally two-sided; when something is brought to light something else is hidden. Kiran traces this two-sidedness of technological mediation through four dimensions, including the ethical which has an involving-alienating structure (Kiran, 2015, pp.134-135). As shown, this structure we also can find in the case of individual monitoring of salmon by facial recognition. The technology can put a distance between the salmon and the carer in that the fish merely appears as production units on a screen, rather than living creatures. At the same time, it has the potential to make us aware of, and able to handle salmons as individual fellow creatures with a good of their own.

Conclusions

As we see, technological mediation may both involve and alienate; enable and constrain; conceal and reveal; create ethical awareness and reinforce instrumentalization. FishNet might on the one hand give us more knowledge about salmon life, their language and nature, information that may indicate how we can provide individual care. Through being involved in the life of the individual salmon, learning to recognize them as individual beings with needs and personalities, it might enable an ethical response or attitude towards farmed fish as morally significant for their own sake, ultimately changing the industry practices. On the other hand, it can also give us a narrow view of these animals by hiding their nature as living fellow creatures rather than biomass in a food production system. In this case animal welfare might remain the prevention of suffering as a means to ensure quality products, and as such, this technology may be reduced to a tool for minimizing loss and increase the profit margin through further instrumentalization of the individual fish. Thus, it may conceal alternative ways to solve the existing problems and challenges necessitating fundamental changes to the way we keep salmon as farm animals.

The two-sidedness of technology should not be understood deterministically, but as tendencies that we may handle through reflexive engagement. By being aware of the ethical dualities of the FishNet facial recognition technology, we may strive to use it for ethical progress rather than allowing unacceptable treatment of individual beings with a good of their own to continue.

References

- Animal Welfare Act [AWA]. (2009). Act of June 19, 2009 no. 97 on animal welfare. Available at: <https://www.regjeringen.no/en/dokumenter/animal-welfare-act/id571188/>.
- Erkinharju, T., Dalmo, R.A., Hansen, M. and Seternes, T. (2020). Cleaner fish in aquaculture: review on diseases and vaccination. *Reviews in Aquaculture*, 13 (1): 189-237.
- Gjerris, M. (2014). Willed Blindness: A Discussion of Our Moral Shortcomings in Relation to Animals. *Journal of Agricultural and Environmental Ethics*, 28(3). 517-532 pp.
- Harfeld, J.L., Cornou, C., Kornum, A. and Gjerris, M. (2016) Seeing the Animal: On the Ethical Implications of Denaturalization in Intensive Animal Production Systems. *Journal of Agricultural and Environmental Ethics*, 29(3). 407-423 pp.
- Kiran, A.H. (2015). Four Dimensions of Technological Mediation. In: Rosenberger, R. and Verbeek, P.P. (ed.) *Postphenomenological Investigations: Essays on Human-Technology Relations*, Lexington Books, Lanham, MD, USA, pp. 123-140.
- Korsgaard, C.M (2018). *Fellow Creatures – our obligations to the other Animals*. Oxford University Press, Oxford, United Kingdom, 272 pp.
- Lien, M.E. (2015). *Becoming Salmon. Aquaculture and the Domestication of a Fish*. University of California Press. Berkeley, USA, 232 pp.
- Mathisen, B.M., Bach, K., Meidell, E., Måløy, H. and Sjøblom, E.S. (2020). *FishNet: A Unified Embedding for Salmon Recognition*. IOS Press: 3001-3008.
- Regan, T. (2004). *The Case for Animal Rights*. University of California Press, Berkeley, USA, 425 pp.
- Saue, O.A. (2018). Heile 30 mill. matfisk er rapportert død so langt i 2018. Available at: <https://ilaks.no/i-2018-er-svinnet-dobbelt-sa-hogt-som-i-2006-heile-30-mill-matfisk-er-rapportert-daud/>.
- Statistics Norway (2020). *Aquaculture (terminated in Statistics Norway)*. Available at: *Aquaculture (terminated in Statistics Norway) – annually, final figures – SSB*.
- Veterinærinstituttet (2020). *Fiskehelse rapporten 2019. Rapport 5a/2020*. Available at: <https://www.vetinst.no/rapporter-og-publikasjoner/rapporter/2020/fiskehelse-rapporten-2019>.
- Yang, X., Zhang, S., Liu, J., Gao, Q., Dong, S. and Zhou, C. (2021). Deep learning for smart fish farming: applications, opportunities and challenges. *Reviews in Aquaculture*, Vol. 13 (1), John Wiley & Sons Australia, Ltd, 66-90 pp.

Section 10.

Data ethics

74. Digital technologies and food waste reduction and prevention: benefits and challenges

N. Strøm-Andersen

TIK Centre for Technology, Innovation and Culture, Faculty of Social Sciences, University of Oslo, Norway;
nbat.strom-andersen@tik.uio.no

Abstract

This paper investigates the adoption of digital technologies for food waste reduction and prevention in Norway. It goes beyond studying one single technology, aiming to have a broad understanding of digital technology adoption as 'a (digital) innovation system' by applying a multiple case study of four different digital technologies used by companies in the food and hospitality sector in Norway. I strive to understand why Norwegian companies, i.e. food producers, grocery chains, restaurants, and cafes (or technology adopters) adopt the technologies in the first place and what benefits and challenges they may encounter along with the adoption. Data inputs for this paper are gathered from semi-structured interviews with several technology adopters. Empirical insights show that the benefits include economic advantage by reducing the amount of waste and increased awareness among employees. However, there are at least several challenges concerning the adoption of digital technologies. Some adopters found that the digital technologies were too costly, incompatible with their internal (IT) systems, or mismatched economic models. Another challenge is employee awareness about food waste and related digital technologies. The paper sheds light on the multiple and complex challenges in adopting digital technologies for food waste prevention and reduction.

Keywords: food waste, digital technology adoption, challenges, digital trends

Introduction

From an environmental perspective, food production is resource-intensive and has significant environmental impacts – GHG emissions (carbon footprint), pressures on land (land footprint), and pressures on water resources (water footprint) (FAO, 2019). If input materials are wasted or used inefficiently, this implies poor use of resources and negative environmental impacts. This indicates the urgency of being resource-efficient and reducing food waste. These aims must be paramount to meet the growing demand for food sustainably. If more food reaches the consumer for a given level of resources used (or, conversely, fewer resources are used to supply the consumer with a given level of food), environmental impacts per unit of food consumed are lowered. Moreover, food waste is also an economic loss and ethical issue. Thus, food waste reduction and prevention appear as a clear and desirable objective.

Numerous studies on food waste have been conducted, but most of them have focused on a consumer behavioural approach and used, for example, practice theory, to study consumer behaviours toward food waste. However, food waste prevention and reduction need a holistic approach that 'has to go beyond putting the responsibility solely on individuals' (Schanes *et al.*, 2018, 989). There is a need to investigate bottom-up initiatives to reduce food waste on the interface between producers, retailers, and consumers. Digital technologies are increasingly acknowledged and identified as a key tool that connects these actors in the fight against food waste (Schanes *et al.*, 2018). This paper investigates the adoption of digital technologies to reduce and prevent food waste in the food and hospitality sector in Norway. More specifically, it studies four different technologies or so-called apps – Too Good To Go (TGTG), Throw no more, eSmiley, and Totalctrl – that are widely adopted by the sectors. The first two apps are

Section 10

Business-to-Consumer (B2C) solutions, connecting groceries, restaurants, and cafes, etc., to consumers, while eSmiley and Totalctrl offer Business-to-Business (B2B) solutions directly to food producers, restaurants, or cafes (B2B). I seek to understand why Norwegian companies, i.e. food producers, grocery chains, restaurants, and cafes, adopt the technologies in the first place and what benefits and challenges they may encounter along with the adoption. The guiding research question for this paper is: ‘What are the benefits and challenges of adopting digital technologies in food waste reduction and prevention?’

Theoretical background

The role and benefit of digital technologies have been discussed in recent studies. For example, they provide better customer experience and engagement, streamlined operations, or new lines of business or business models (Fitzgerald *et al.*, 2014). Digital technologies and digital innovation also offer a new (open-ended) value space to anyone seeking to create or capture new value (Henfridsson *et al.*, 2018, Holmström, 2018, Nambisan *et al.*, 2019). However, existing literature on digital innovation reifies the agency of digital innovation actors, ‘making overly simplistic assumptions about the ability of digital innovation actors to cause change(s) in the world, rather than acknowledging the complexity of how their actions interact with, and can be shaped by, wider change processes’ (Holmström, 2018, 108). It reveals how the adoption process is shaped by the context of food waste that represents an environmental, economic, and ethical problem. Food waste, long seen as an economic loss, is now considered a potential for value creation thanks to the development of new technologies and solutions, such as biotechnologies or, recently, digital technologies to reduce and prevent food waste, through which economic loss is minimized. This paper looks beyond the technical features of the apps by enquiring into the challenges of the technology adopters while adopting the mentioned apps.

The challenges of digital technology adoption may be related to the process from initiation (triggers, opportunity identification, decision-making), development (designing, developing, adopting), implementation (installing, maintaining, training, incentives), and exploitation (maximizing returns, leveraging existing systems/data for new purposes), which is shaped by the internal organizational environment (inside firms) and the external competitive environment (outside firms) (Kohli and Melville, 2018). Firms’ business strategies, cultures, and ways of doing things – the internal organizational environment – can have a significant impact on the adoption of digital technologies. Furthermore, organizations intend to apply digital technologies to rejuvenate and transform their business under increasing pressure from the external competitive environment. However, recent studies show that the readiness to respond to digital trends is not there yet for many (Kohli and Melville, 2018). Hence, there seems to be a misalignment between demands in the marketplace and organizational capabilities to respond (Kohli and Melville, 2018). Another challenge for digital technology adoption can be related to firm innovation strategies and skills (Ciarli *et al.*, 2021). To adopt new digital technologies, organizations require new skills to innovate, learn, and adapt, which can be time-consuming and even costly. Institutional challenges such as intransigent corporate behaviours and routines, rigid legacy technologies, innovation fatigue, or internal politics can create strong barriers to change (Fitzgerald *et al.*, 2014). The role of leadership and the ‘sense of urgency’ can be crucial for digitalization. Leaders who have no vision or a road map for digital transformation often feel no urgency to embrace digital technologies and thus are unable to make business cases for their digital initiatives (Fitzgerald *et al.*, 2014). Very few studies on food waste and digital solutions have been conducted. de Almeida Oroski (2020) explored nine food waste reducing apps through a business model lens – value proposition, value creation, and value capture, however, from a technology developer’s angle. The author finds that the technology is not enough to assure the success of a food waste reducing app. Organizations must consider non-technological aspects to enable their new businesses.

Methods and the case studies

The reason for choosing these two sectors – the food and the hospitality – in this study is that they are closely connected with the food value chain and the food waste issue, and many companies in these two sectors use the four studied digital technologies. This paper also goes beyond looking at one single technology, aiming to have a broad understanding of digital technology adoption as ‘a (digital) innovation system’, investigating how food companies in the two sectors innovate regarding digitalization.

Too Good To Go is a popular app for food waste. Although it was first introduced in Denmark in 2015, it is now present in 17 countries (15 in Europe, Canada, and the USA). The concept is to connect users with unsold food from a number of shops, groceries, cafes, and restaurants based on attractive reduced prices. A total of 53.2 million people use the app, 142,040 cafes, restaurants, and hotels are registered, and 121 million meals have been saved worldwide (TGTG International, 2022). In Norway alone, the app has reached 4,162 stores and restaurants and 1.7 million users who have helped save over 7 million food portions (TGTG Norway, 2022). Users order and pay for their food through the app. Throw no more is a relatively new app launched in February 2020 but already has 539 grocery stores in Norway registered as partners (Throw No More, 2022). The app lists all the foods with reduced prices in a particular grocery store together with the information on the quantity and expiration date. When stores reduce the price of groceries due to short shelf life, they automatically appear in the app. Users/consumers buy and pay for goods in the store. With the Throw No More app, users will get an overview of the products that the grocery stores in their local area have at a reduced price, either because they are approaching the expiration date or because they cannot be sold at full price for other reasons. This makes it possible for the users/consumers to plan the purchase of groceries at a reasonable price. The main difference is that: with TGTG, consumers do not know what they will get in the magic box; sometimes, it comes as a complete surprise. But with Throw no more, consumers plan their purchases through the app and know exactly what they want to have. eSmiley and TotalCtrl are tailor-made digital project management tools that allow users (customers) to record their food inventory, register, and measure food waste (eSmiley, 2022, TotalCtrl, 2022). eSmiley was first launched in Denmark in 2007, and TotalCtrl has been established recently. It gives users an overview of where food waste occurs and detailed reports on food waste at three levels: raw materials in stock, menus, and guest level. Customers of eSmiley and TotalControl are grocery stores, hotels, restaurants, commercial kitchens, and food manufacturers/producers.

Data inputs for this paper are gathered from fourteen semi-structured interviews with ten companies, restaurants, cafes, groceries, etc., using these apps and the four technology developers providing the apps. I find the need to ‘talk’ directly to the technology adopters to understand their motivation – why they want to adopt the technology – and, especially, gain an insight into the challenges of digital technology adoption. Further, talking to the technology providers helped me understand more about how the technologies work. The interviews were carried out in the period 2020–2022. The analytical process was performed in NVivo. The qualitative analysis is supplemented by desktop research on digital technologies and digital innovation concerning food waste and grey literature on food waste apps. According to FoodWIN (2021), there are more than 50 digital solutions related to food waste focusing on preventing food waste, raising awareness, turning food surplus into meals, processing food surplus to create new products, and connecting and redistributing food surplus.

Findings

Most companies involved in this study disclosed the main reason for them to adopt the digital technologies was to reduce food waste because food waste present an economic loss and environmental and ethical concerns. Thus, the companies showed their responsibility to address the food waste problem

Section 10

by adopting digital solutions, among other strategies. Some acknowledged the role of these digital tools in reducing the amount of food waste and increasing their economic benefits, as well as raising the awareness among employees about the digital tools and the food waste issue:

[By using the app] an area [or site] manager can go into his portfolio, or to look at his portfolio at the end of the month where a lot of food that has been thrown away, or where their food waste is located. [...] It's [one technology] really a nice tool, very useful to [...] get people on board [and] you can point to, what is actually happening when we start measuring and weighing and thinking about our food waste. [...] Here you [the informant talking about the site managers] can see what you have thrown, now you have thrown 5,000 kroner right in the trash, which could have been eaten. (Informant)

By weighing and measuring food waste through the apps, which was translated into an economic value, the technology adopters had an overview of the quantity and types of wasted food; hence they had better control of their food stock and improved their routines and purchasing. By looking at the actual numbers, their employees understood more about the issue and were motivated to work with food waste and the apps.

However, empirical insights show there are at least several challenges concerning the adoption of digital technologies (Kohli and Melville, 2018). Some adopters found that the technologies were '*too costly*' to use in the long run (after the trial period). As most of the companies in the hospitality sector are small family driven, they did not have enough economic resources to buy the technology. Other technology adopters realized that the technologies were incompatible with their sales/IT systems; this is related to the implementation of the adoption process:

This [digital technology] does not necessarily speak so well with our systems because the application cannot be integrated into our internal systems. (Informant)

Not all the interviewed companies experienced the same problem, but a couple of them. Often, two different IT systems cannot be easily integrated, which requires two partners – the technology adopter and the technology provider – to work together, adjust or change necessary technical elements.

Furthermore, the adopter's economic model, related to franchising and ownership, could be a challenger to the technology adoption. This issue was linked to the internal organizational environment:

Some merchants use the app, but it is difficult to document how much is sold [in the systems]. The franchisee owns the waste, sales via [the app] are not automatically registered in the system as sales, but as waste. (Informant)

This was a big challenge for a grocery chain with hundreds of stores. Again, it was the question of learning and incorporating the new digital tool into the existing sales system. The whole chain must train its store managers on how to register the waste and practice the same policy at all stores.

Another challenge was associated with employee awareness about the benefits of using the technology and involving more company's departments in the technology adoption:

[The name of a technology], it's a very nice thing, [...], at least in the larger departments, but [...] it's a little harder again to get all the canteen managers [of smaller departments to use it]. ... I also see it as a challenge [...] to get the area leaders, or site managers, on that piece here [to use the technology], not everyone thinks it is great fun in the

beginning, that's it, you must get them on board, and I feel that is [...] the biggest job in the beginning.
(Informant)

A catering company that owns hundreds of canteens in various sizes experienced a vast difference between the large departments and the small ones. The large canteens found it advantageous to use the app, while the smaller ones were not that interested. It was understandable that the larger departments might have more waste worth taking care of, and it was more economically beneficial to take advantage of the app. The smaller departments might not have enough resources for that. Another empirical finding points to the issue of employee awareness and the role of canteen or site managers who showed interest and engagement in the food waste work to different extents. The managers who were more interested in reducing food waste showed more engagement and were more eager to learn and explore new food waste tools or technologies than the others who were less interested.

Discussion and conclusions

This paper investigates the adoption of digital technologies for reducing and preventing food waste in the food and hospitality sector. The author found that the technology adopters acknowledged several benefits of using the apps, but they also encountered some challenges regarding the technology adoption and implementation process. The benefits include economic advantage by reducing the amount of waste and increased awareness among employees. These challenges are related to the costs of the apps, technical incompatibility between the technologies and the adopter's existing internal (IT) systems, mismatch with the adopter's economic model, and employee awareness about food waste and related technologies.

The first three challenges are related to adopting digital trends in the marketplace and organizational capabilities to respond, as discussed by Kohli and Melville (2018). For example, the technology providers might have to adjust their prices to meet the adopter's purchasing ability or vice versa. There is also a need for technical customization to incorporate different IT systems. The providers should offer user-friendly solutions as employees of the companies in the hospitality sector and grocery chains often have limited time to sit with the apps. This requires the technology adopters and providers to understand each other's expectations and needs and work closely together to solve the problems.

The last challenge of digital technology adoption is somehow related to firm innovation strategies and skills Ciarli *et al.* (2021). The employees need to develop new skills to innovate, learn, and adapt to the new tools; they need to be trained. Thus, the companies should invest time and money in training their employees. However, this paper adds a new element to studying digital technology adoption in food waste reduction and prevention, which is about employee awareness. It will be advantageous for the companies to increase employee awareness about food waste in general (its environmental, economic, and ethical aspects) through educational programs. Employee awareness of the food waste problem and the technologies is one of the crucial factors contributing to the success of digital technology adoption. Empirical evidence also shows the vital role and responsibility of managers who had to get the employees involved and increase their awareness of the digital solutions and the food waste problem in general. These managers showed some 'sense of urgency' in addressing the food waste challenge and advancing their actions by adopting the digital technologies as part of the company's solutions (Fitzgerald *et al.*, 2014).

The paper sheds light on the multiple and complex challenges of digital technology adoption for food waste prevention and reduction. It draws several valuable lessons for both technology adopters and technology providers. These recommendations are not only connected to the food waste issue in the food and hospitality sector, but also other relevant industries as digital technology adoption has become increasingly common today. Apart from these digital technology examples in this study, many other

Section 10

existing technologies should be investigated, which might help us have more knowledge about efficacious solutions to transform the food system sustainable food production and consumption.

References

- Ciarli, T., Kenney, M., Massini, S. and Piscitello, L. 2021. 'Digital technologies, innovation, and skills: Emerging trajectories and challenges.' *Research Policy* 50 (7). <https://doi.org/10.1016/j.respol.2021.104289>.
- de Almeida Oroski, F. 2020. 'Exploring food waste reducing apps – a business model lens.' In *Food Waste Management*, 367-387. Springer.
- eSmiley. 2022. 'About us'. <https://www.esmiley.com/about-us>.
- FAO. 2019. *The state of food and agriculture 2019. Moving forward on food loss and waste reduction*. In *The State of the World*. Rome: FAO.
- Fitzgerald, M., Kruschwitz, N., Bonnet, D. and Welch, M. 2014. 'Embracing digital technology: A new strategic imperative.' *MIT Sloan Management Review* 55 (2):1-12.
- FoodWIN. 2021. 'The most inspiring European Food Waste Changemakers in 2018.' accessed 04.09.2021. <https://totalctrl.com/wp-content/uploads/2018/11/The-Food-Waste-50.pdf>.
- Henfridsson, O., Nandhakumar, J., Scarbrough, H. and Panourgias, N. 2018. 'Recombination in the open-ended value landscape of digital innovation.' *Information and Organization* 28 (2):89-100. <https://doi.org/10.1016/j.infoandorg.2018.03.001>.
- Holmström, J. 2018. 'Recombination in digital innovation: Challenges, opportunities, and the importance of a theoretical framework.' *Information and Organization* 28 (2):107-110. <https://doi.org/10.1016/j.infoandorg.2018.04.002>.
- Kohli, R. and Melville, N.P. 2018. 'Digital innovation: A review and synthesis.' *Information Systems Journal* 29 (1):200-223. <https://doi.org/10.1111/isj.12193>.
- Nambisan, S., Wright, M. and Feldman, M. 2019. 'The digital transformation of innovation and entrepreneurship: Progress, challenges and key themes.' *Research Policy* 48 (8). <https://doi.org/10.1016/j.respol.2019.03.018>.
- Schanes, K., Dobernig, K. and Gözet, B. 2018. 'Food waste matters – A systematic review of household food waste practices and their policy implications.' *Journal of Cleaner Production* 182: 978-991. <https://doi.org/10.1016/j.jclepro.2018.02.030>.
- TGTG International. 2022. 'Save food help the planet.' <https://toogoodtogo.com/en-us>.
- TGTG Norway. 2022. 'Vi er Too Good To Go.' <https://toogoodtogo.no/no/about-us>.
- Throw No More. 2022. 'Hvem er Throw No More?' <https://thrownomore.no/>.
- TotalCtrl. 2022. 'About us.' <https://totalctrl.com/about-us>.

75. Do we improve any aspects of animal welfare by implementing Computer Vision in livestock farming?

A. van Putten*, M.F. Giersberg and F.L.B. Meijboom

Utrecht University, Faculty of Veterinary Medicine, Centre for Sustainable Animal Stewardship, Yalelaan 2, 3584 CS Utrecht, the Netherlands; a.vanputten1@uu.nl

Abstract

Computer Vision technology has been developed recently as a tool for measuring behaviour on the individual level in group housed livestock. This form of digital agriculture or precision livestock farming has the potential to answer to public concerns on farm animal welfare by using the data to reduce the risk of harmful social interactions such as tail biting in pig production and severe feather pecking in laying hen production. Computer Vision, however comes with changes to livestock farming and therefore can lead to new moral questions. Currently it has not resulted in much public debate. We argue that this is not to be understood as a sign that there are no societal and ethical challenges, but that – as part of responsible research and innovation – this is an important moment to explore and analyse the potential societal and ethical issues. In this paper we aim to explore the moral dimensions of the use of Computer Vision in livestock farming with a special focus on poultry. We analyse the moral dimensions from an animal welfare perspective. Although introduced to prevent welfare risks or improve the welfare status of animals, this innovation can lead to welfare questions depending on one's concept of animal welfare.

Keywords: animal welfare, computer vision, ethics

Introduction

Have you ever tried to follow one chicken around in a flock of thousands? The movement, behaviour and interactions of livestock animals provide important indicators of animal welfare. Following the general trend in western countries towards improved livestock welfare in intensive systems, understanding and managing animal behaviour has become of high priority. Phenotypic measurements such as egg quality or feed conversion have been implemented at different levels in the livestock industry, measurements on behaviour mostly rely on observations by a researcher in a study on traditional small groups and (individual) cage housing. These measurements do not reflect the commercial practice. Taking the laying hen industry in the Netherlands as an example, public concern for animal welfare and ecological footprint have caused a shift from cage housing in small groups to flocks of tens of thousands in mostly aviary systems. This setup increases the risk of harmful behaviour such as severe feather pecking which is causing injuries and mortality on a large scale. Measurements on this behaviour could improve the prevention and reduction of harmful social behaviour via management solutions and changes in breeding. Management solutions have been studied based on group behaviour and individual measurements could help create effective management solutions. The implementation of social behaviour as a phenotype into breeding practices could significantly improve animal welfare of livestock on a global level. Breeding for improved animal welfare has therefore been described by Fernyhough *et al.* (2020) as the moral responsibility of the breeding companies. The current inability to include direct measurements of social behaviour into genetics programmes reduces the effectiveness of implementing breeding for improved animal welfare. Animal welfare is a multifactorial phenomenon and monitoring of it is not an easy task. It requires insight in a broad range of parameters, preferably in many occasions and over a longer period. This makes animal welfare monitoring not only time consuming, but raises also issues of feasibility if the aim is to monitor many hundreds or even thousands of animals. Technology can

play an important role in this case. Currently used technologies such as RFID, ultra-wide band tracking and accelerometers do not provide information on social behaviour but have been used for monitoring animal health and welfare by enabling to collect data on activity and location on the individual level. This contributes to the automatic assessment of animal health, welfare, the spatial distribution and behaviour of animals (Ellen *et al.*, 2019). However, the collection of data on social interactions between animals in groups has not been feasible by these technologies. This is problematic, because individual welfare is also influenced by social behaviour and group interactions. Furthermore, animal welfare does not only raise questions at the level of the individual but also at group level. Therefore the introduction of Computer Vision seems promising, for it has the ability to measure social behaviour in groups of livestock by constructing meaningful descriptions of physical objects from images. For example the use of Computer Vision technology allows for measuring and acting upon tail biting in pig production and feather pecking and smothering in groups of laying hens.¹⁸ Next to detecting such problems, the ability to aggregate and process large amounts of data also enables to prevent such problems with the help of early detection markers. Computer Vision has a huge potential but is still in development (Guo *et al.*, 2022). This includes a number of technical challenges next to more societal and ethical dimensions. In this paper we focus on these later aspect for three reasons. First, Computer Vision is not a stand-alone technology in livestock farming. It fits in developments of data driven farming, digital agriculture, smart farming and Precision Livestock Farming (PLF). At the same time Computer Vision adds functionalities to existing technologies of which the effect has not been studied before. Also, the requirements for Computer Vision include big data processing and therefore could strongly enhance the shift towards data driven farming. Therefore, it is important to reflect on the potential impact of Computer Vision as part of the increased use of technology in livestock farming for all involved stakeholders. Second, in line with the striving for responsible research and innovation, it is important to reflect on the societal and ethical dimensions of this innovation during the process of development rather than focusing on risks in terms of increasing acceptance (Klerkx *et al.*, 2019; Wathes *et al.*, 2008). The third reason for the focus on the societal and ethical dimensions of Computer Vision may sound paradoxical: lack of explicit public debate or broadly identified moral dilemmas. In comparison to, for example the use of modern biotechnology in breeding, digitalization and automation in livestock do not yet result in much public debate. This is not to be understood as a sign that there are no societal and ethical challenges, but that – as part of responsible research and innovation – this is an important moment to explore and analyse the potential societal and ethical issues. In the remaining of this paper we explore the animal welfare related moral dimensions of the use of Computer Vision in livestock farming.

Computer Vision in livestock and animal welfare

Developing Computer Vision applications in the livestock production sector can be understood as a result of recent public concern for livestock welfare in western societies. The ability to monitor individual as well as group behaviour with Computer Vision enables to better assess welfare and recognize (group) behaviour that indicates welfare risks or positive interactions amongst the animals. However, to assess whether this innovation is effective or desirable directly leads to well known discussions on the concepts of animal welfare. If one starts with Ohl and Van der Staay (2012) stressing the importance of positive welfare, the adaptive capacities of animals and the dynamic character of this concept, one would focus on different parameters in using Computer Vision than if one would take the Five Freedoms as a start. Such conceptual differences are not only rooted in biological views on welfare, but also link to ethical views on what makes animal welfare morally important. Therefore, to explore the animal welfare related moral dimensions of Computer Vision we do not have a 'one size fits all' approach and have to take the various views on welfare into consideration. For this paper we use the three views as defined by Fraser (2008): basic health and functioning; affective states; and natural living.

¹⁸ These are also the case studies from the Imagen research project (NWO, 2020) that this paper is part of.

Basic health and functioning

The domain of basic health and functioning is what Computer Vision mainly aims to improve. The current level of injuries and mortality cause a major animal welfare issue. One target harmful behaviour is severe feather pecking behaviour, which is causing injuries and mortality in laying hen production systems. Feather pecking is the pecking, pulling out and eating of feathers of conspecifics. This behaviour is separate from aggressive pecking, which is linked to establishing hierarchy in small groups. The motivation of laying hens in large groups for severe feather pecking could best be described as redirected foraging behaviour and the problem has been found to be multifactorial. The behaviour spreads through the flock and can lead to cannibalism (Cronin and Glatz, 2021; Rodenburg *et al.*, 2013). Another type of behaviour which causes mortality and harm in laying hen production is the smothering or the suffocation of hens due to crowding and piling. Our understanding of this specific behaviour is limited and additional detailed research is needed (Gray *et al.*, 2020; Winter *et al.*, 2021). These harmful types of behaviour could be found in all housing systems and are more prominent in large groups of hens (Lay *et al.*, 2011). Current methods of measuring behaviour rely on individual data of location or on group level continuous monitoring. Computer Vision could provide a new method to directly measure these behaviours on the individual level. From this perspective, Computer Vision mainly enables to address welfare problems and does not raise serious concerns about wider ethical concepts such as animal integrity and the impact on the human animal relationship. The ethical discussion seems to be limited to the requirements of Computer Vision for using of markers on birds and the effects these wearables may have on bird behaviour and welfare.

Affective state

From the perspective that animal welfare is about subjective experiences, Computer Vision can be an interesting innovation. For instance, social interactions provide an indicator for positive welfare. All livestock species are social animals to some extent. The time individuals spend together and the interactions they have will provide insights into their emotional state. Therefore the use of Computer Vision for measuring social interactions will improve our understanding of individual affective states. In the example of laying hens, severe feather pecking behaviour has been found to be positively correlated with time spend foraging and negatively correlated to dust bathing behaviour (Newberry *et al.*, 2007). Dust bathing behaviour in laying hens is strongly related to a positive affective state and by measuring this behaviour through Computer Vision, positive welfare could be studied. By studying the relation between different types of behaviour through modelling of behaviour on the individual level, the affective state of animals and factors of influence could be determined in both directions.

From this perspective, Computer Vision can be promising since it enables to take affective states, both positive and negative in to account. The main concern would be that it will be used only in a rather limited way focusing on reducing morbidity and mortality, for instance to prevent production loss. This would not do justice to the wider dimensions of welfare.

Natural living

The natural living view stresses the ability of animals to 'live reasonably natural lives by carrying out natural behaviour and having natural elements in their environment'. (Fraser, 2008, p. 3). From this perspective, Computer Vision could have added value. The ability to measure the expression of natural behaviour allows for deeper understanding of these natural behaviours and effect of environmental stimuli. Computer Vision could for instance measure the range use of an animal to a (semi-)outdoor environment, which is a natural living demand incorporated into some labels for animal welfare. Adaptations to the livestock industry towards natural living could be offered to farmers by using

Section 10

a direct implementation on farm or by offering products based on measurements of natural living via research on animal management and breeding. However, in order to use Computer Vision, the technical requirements pose conditions which are not in line with the domain of natural living. Markers or tags on the animals need to be used in order to link measurements of behaviour to the correct individual. These wearables might interfere with the ability to perform natural behaviour, as for instance a backpack on a bird makes feather grooming more difficult. The type of environment suited for Computer Vision should reflect the environment to which the algorithm was developed. Placing cameras in a strongly controlled environment allows for a more straight forward implementation. Natural elements such as rain and large plants provide natural conditions but reduce the required visibility, making implementation more difficult. Also, the required internet connectivity for Computer Vision services during the developmental phase could more easily be found in urban areas, reducing the possibilities to outdoor access. Still one could argue that most of these concerns can be addressed in the course of the development of this technology. However, there are also some more principled points of concern that the technology takes current systems and infrastructure as the default. For instance, the target species also has to resemble the breed used in the training images, which excludes breeds with a different morphology. For instance a Computer Vision algorithm built for commercial broilers might not be applicable to dual-purpose hens of which more natural behaviour could be expected. Lastly, the investment costs of Computer Vision might cause a shift away from natural living. The system might only be affordable to large production units and leave out small family farms. The costs per animal will also be lower in an intensive system compared to a system in which more space is given to each animal, for less video frames need to be analysed. The technical requirements of Computer Vision thus negatively affect natural living.

Conclusions

In this paper, we aimed to map the implications of the current introduction of Computer Vision technology from the perspective of the three animal welfare dimensions: basic health and functioning, affective states and natural living. We conclude that this form of digital agriculture or Precision Livestock Farming has many applications. The greatest potential of the technology and our primary focus is in its ability to measure social interactions on the individual level in group housed livestock. Harmful social behaviour of livestock such as severe feather pecking in laying hens and tail biting in pigs have been one of the major negative influences on animal welfare in group housed livestock. The entire topic of measuring social behaviour in livestock using Computer Vision has, in spite of its potential impact, not resulted in much public debate. From the view on welfare as a dimension of basic health and functioning this lack of debate should not come as a surprise. The potential for Computer Vision to improve welfare is significant, and concerns seem to arise only regarding the technical requirement of animals wearing markers or sensors. This conclusion is already different from the perspective of the affective state view. This perspective will consider Computer Vision promising as it enables assessing these affective states. However, the risk lies in using the existing data in a shallow way and thus one should be cautious to use this potential not only to prevent mortality and production loss, but also to do justice to the broader dimension of welfare and enable positive affective states. Regarding the perspective of natural living, Computer Vision can provide insights into natural behaviours and the environmental conditions that enable these behaviours. However, one would expect much more debate, because the technology requires the use of wearables that might interfere with the animal's physical ability, is currently not developed to function in free-range systems and might take current breeds as the default in developing a Computer Vision algorithm.

This analysis shows that a mere reference to animal welfare in the ethical assessment of Computer Vision is not sufficient. The multi-layered character of this concept entails that we have to be as explicit as possible in explaining what we mean with welfare and why this is important in the context of Computer Vision. Otherwise a false clarity will frustrate the ethical evaluation. This need for clarity is especially important because the morally relevant dimensions of Computer Vision go beyond of the field of animal welfare. This technology for instance strongly pushes the market further towards data driven agriculture and may be particularly suitable in intensive environments and raise questions of justice and privacy for farmers. Furthermore, it has an impact on the human-animal relationship. These dimension need to be further addressed elsewhere, but also emphasize the need to be as precise as possible when one refers to the animal welfare dimensions of Computer Vision.

Acknowledgements

This publication is part of the project IMAGEN [P18- 19 project 1] of the research programme Perspectief, which is financed by the Dutch Research Council (NWO).

References

- Cronin, G.M. and Glatz, P.C. (2021). Causes of feather pecking and subsequent welfare issues for the laying hen: a review. *Animal Production Science*, 61(10), 990-1005. <https://doi.org/10.1071/AN19628>
- Ellen, E.D., van der Sluis, M., Siegford, J., Guzghva, O., Toscano, M.J., Bennewitz, J., Van Der Zande, L.E., Van Der Eijk, J.A.J., De Haas, E.N., Norton, T., Piette, D., Tetens, J., de Klerk, B., Visser, B. and Rodenburg, B.T. (2019). Review of sensor technologies in animal breeding: Phenotyping behaviors of laying hens to select against feather pecking. *Animals*, 9(3). <https://doi.org/10.3390/ani9030108>
- Fernyhough, M., Nicol, C. J., van de Braak, T., Toscano, M. J. and Tønnessen, M. (2020). The Ethics of Laying Hen Genetics. *Journal of Agricultural and Environmental Ethics*, 33(1), 15-36. <https://doi.org/10.1007/s10806-019-09810-2>
- Fraser, D. (2008). Understanding animal welfare. *Acta Veterinaria Scandinavica*, 50(SUPPL. 1), 1-7. <https://doi.org/10.1186/1751-0147-50-S1-S1>
- Gray, H., Davies, R., Bright, A., Rayner, A. and Asher, L. (2020). Why Do Hens Pile? Hypothesizing the Causes and Consequences. *Frontiers in Veterinary Science*, 7(December), 1-13. <https://doi.org/10.3389/fvets.2020.616836>
- Guo, Q., Sun, Y., Min, L., van Putten, A., Knol, E., Visser, B., Rodenburg, T., Bolhuis, J., Bijma, P. and N. de With, P. (2022). Video-based Detection and Tracking with Improved Re-Identification Association for Pigs and Laying Hens in Farms. 4(Visigrapp), 69-78. <https://doi.org/10.5220/0010788100003124>
- Klerkx, L., Jakku, E. and Labarthe, P. (2019). A review of social science on digital agriculture, smart farming and agriculture 4.0: New contributions and a future research agenda. *NJAS – Wageningen Journal of Life Sciences*, 90-91(October), 100315. <https://doi.org/10.1016/j.njas.2019.100315>
- Lay, D.C., Fulton, R.M., Hester, P.Y., Karcher, D.M., Kjaer, J.B., Mench, J.A., Mullens, B.A., Newberry, R.C., Nicol, C.J., O'Sullivan, N.P. and Porter, R.E. (2011). Hen welfare in different housing systems. *Poultry Science*, 90(1), 278-294. <https://doi.org/10.3382/ps.2010-00962>
- Newberry, R.C., Keeling, L.J., Estevez, I. and Bilčík, B. (2007). Behaviour when young as a predictor of severe feather pecking in adult laying hens: The redirected foraging hypothesis revisited. *Applied Animal Behaviour Science*, 107(3-4), 262-274. <https://doi.org/10.1016/j.applanim.2006.10.010>
- NWO. (2020). AnIMAI Group sENsor – Integrating behavioural dynamics and social genetic effects to improve health, welfare and ecological footprint of livestock (IMAGEN). <https://www.nwo.nl/onderzoeksprogrammas/perspectief/perspectief-programmas/animal-group-sensor-integrating-behavioural>
- Ohl, F. and van der Staay, F.J. (2012). Animal welfare: At the interface between science and society. *Veterinary Journal*, 192(1), 13-19. <https://doi.org/10.1016/j.tvjl.2011.05.019>

Section 10

- Rodenburg, T.B., van Krimpen, M.M., de Jong, I.C., de Haas, E.N., Kops, M.S., Riedstra, B.J., Nordquist, R.E., Wagenaar, J.P., Bestman, M. and Nicol, C.J. (2013). The prevention and control of feather pecking in laying hens : identifying the underlying principles. 69(June), 361-374. <https://doi.org/10.1017/S0043933913000354>
- Wathes, C.M., Kristensen, H.H., Aerts, J.M. and Berckmans, D. (2008). Is precision livestock farming an engineer's daydream or nightmare, an animal's friend or foe, and a farmer's panacea or pitfall? *Computers and Electronics in Agriculture*, 64(1), 2-10. <https://doi.org/10.1016/j.compag.2008.05.005>
- Winter, J., Toscano, M. J. and Stratmann, A. (2021). Piling behaviour in Swiss layer flocks: Description and related factors. *Applied Animal Behaviour Science*, 236(November 2020), 105272. <https://doi.org/10.1016/j.applanim.2021.105272>

Section 11.

Miscellaneous

76. Closing the gap: the interface between animal law and animal ethics

S.S. Andersen* and M. Gjerris

Department of Food and Resource Economics, University of Copenhagen, Rolighedsvej 23, 1958 Frederiksberg C, Denmark; ssa@ifro.ku.dk

Abstract

A recent paper in PlosOne has reported that on average 85% of all Danish egg-layers in commercial production systems, whether caged or non-caged, have keel bone fractures (KBF). Based on this case, the paper analyses the discrepancy between animal law and animal ethics taking as a point of departure the difference between the law regulating the use of animals for production and a production system that relies on animals bred and held in a way that leads to the majority of them living with serious physical injuries. According to the fundamental norm laid down in section 2 of the Danish Animal Welfare Act, animals must be treated properly and protected as far as possible from pain, suffering, fear, permanent injury and severe distress. This seems impossible to reconcile with the current situation for egg-layers and one therefore would think that the production would be shut down immediately after the publication of the research. Reality, however, is different. The industry has promised to investigate the problem and a timeframe ranging from 10-20 years for rectifying the situation has been presented. This situation illustrates how the ethical intentions behind animal law come up short when faced with the economic logic of animal production. This leads us to ask whether the interface between animal law and animal ethics, where the language of rights is typically used to 'transfer' ethical considerations into regulation, ought to be framed differently by approaching the issue from other philosophical perspectives such as consequentialism, virtue ethics and ethics of care. Furthermore, we will carry out a preliminary analysis of the ramifications of such approaches.

Keywords: keel bone fracture, animal welfare, animal legislation, ethics of rights, virtue ethics

Keel bone fractures

Keel bone fractures (KBF) in egg-layers have for at least the past 10 years internationally been recognized as a problem in the egg production (e.g. Rodenburg, 2008, FAWC, 2010 and EFSA, 2015) although estimates of the prevalence vary (Rufener and Makagon, 2020). Unsurprisingly, the research into the welfare consequences of KBF for the animals, however limited in its scope, indicates that KBF are related to negative animal welfare including 'reduced mobility and potentially negative affective states' (Rieber *et al.*, 2018). KBF are considered a multi-factorial problem caused by a range of factors including poor ossification, rearing duration, high and persistent egg production, body size, egg size, inactivity, underlying disease and housing conditions (Toscano *et al.*, 2020, Thøfner *et al.*, 2021). In August 2021 a paper with the title 'Keel bone fractures in Danish laying hens: prevalence and risk factors' was published in PloSOne (Thøfner *et al.*, 2021). The research found that the global prevalence of birds with +1 KBF (i.e. one or more fractures) in the different production systems were 80,7% for hens in enriched cages, 87,5% for hens in systems applying to the Danish standards for organic and free-range production and 90,1% for hens housed in barns. The industry itself estimates that there are 3,8 million animals in the Danish egg industry (Danske Æg, 2022) resulting in more than 3,2 million animals being affected by KBF to some extent. The prevalence of the problem came as a surprise to the public and was 'scandal of the week' on social media (e.g. Malling, 2021).

Section 11

The largest Danish animal NGO 'Animal Protection Denmark' with 75.000 members (Dyrenes Beskyttelse, 2022a) almost immediately called for a stakeholder meeting between the different actors. According to the reported outcome, serious concerns were expressed and around the table there was a willingness to act. This resulted in promises of further research into the causes of the problem and possible solutions both with regard to production methods and breeding goals. The issue has also been raised in the Intergroup on the Welfare & Conservation of Animals, which consists of members of the European Parliament, and the Commission is reported to be under way with a 'full package' revision to the relevant legislation (Intergroup on the Welfare & Conservation of Animals, 2022). It is worth mentioning that several voices including a spokesperson from the Danish Agricultural sector have stated that from a breeding perspective a solution could be 10-20 years down the road (Malling, 2021). In November 2021, the Danish political party 'Veganerpartiet' (the Vegan Party) reported four egg producers to the police for violating section 2 of the Danish Animal Welfare Act due to the documented issues with KFB. The case was dismissed by the police, citing that the affected animals could only be identified postmortem as producers are not able to identify animals in need of treatment/euthanasia during routine monitoring of live animals. Furthermore, due to the scientific uncertainty concerning the causes of KFB, the individual producers could not be seen as having caused KFB (Midt- og Vestjyllands Politi, 2022).

The Danish Animal Welfare Law

The fundamental norms of the Danish animal welfare law are laid down in section 2 and 3 of the Danish Animal Welfare Act (Retsinformation, 2021). According to section 2, animals must be treated properly and protected as far as possible from pain, suffering, fear, permanent injury and severe distress. Furthermore, when animals are under human care, it must be ensured that they are treated with consideration, including housing, feeding, watering and care taking into account their physiological, behavioural and health needs in agreement with established practical and scientific experience, cf. section 3 (similar provisions are found at the EU-level, cf. Council Directive 98/58/EC concerning the protection of animals kept for farming purposes). Contravention of section 2 or 3 is sanctioned with up to 2 years prison. Incidentally, according to a ministerial order (Retsinformation, 2020), natural or artificial breeding or breeding procedures which cause or are likely to cause suffering or injury to the animals concerned must not be practiced. Furthermore, no animal shall be kept for farming purposes unless it can reasonably be expected, on the basis of its genotype or phenotype, that it can be kept without detrimental effect on its health or welfare. Surprisingly, neither of these provisions, which originate from Council Directive 98/58/EC, were considered with regard to the report filed by Veganerpartiet.

The prohibition and criminalizing of certain treatments of animals is akin to the way that the physical integrity of human beings is protected, e.g. through criminal code provisions on murder and bodily assault. Even though the notion of 'rights' is not invoked in the Animal Welfare Act, it seems well founded to describe the provisions in section 2 and 3 as being inspired by the ethical rights-model similarly to the way that human rights concerning the right to life and freedom from torture are protected through the criminal code provisions are protected. This should come as no surprise since the logic of rights fits the nature of legal provisions, in particular legal provisions that prohibit or prescribe certain behaviours, which are often employed with regard to animal protection. However, the rights-approach has obvious shortcomings. Firstly, there is the often-debated issue concerning legal subjectivity and legal standing. Thus, in most jurisdictions, animals are denied legal standing and neither the animals nor anybody on their behalf has a legal capacity to invoke their rights before the authorities or the courts (Wise, 2019; Kurki, 2021). Secondly, despite the rights-inspired wording of the legal provisions, practices conflicting with the 'rights' are in reality accepted as exemplified by the prevalence of KFB among egg-laying hens. As there is no second line of legal protection for the animals in contexts such as the present KFB situation – i.e. no other rules that offer protection – the animals are left in a legal no-man's-land.

The problem

We can now explicate the problem that we wish to address: There seems to be a discrepancy between the provisions in the Danish Animal Welfare Act and reality. It is hard to see how one can reconcile a situation where the law states that animals ‘must be treated properly and protected as far as possible from pain, suffering, fear, permanent injury and severe distress’ with a situation where more than 3,2 million animals are affected by KBF. We realize that there might be pragmatic reasons behind the rejection by the police of the filed complaint. However, as a result, for a number of years millions of individual hens will live in production systems while suffering KFB despite being protected by a law, which according to its wording renders this situation illegal. Additionally, even if the situation is not rectified within this timespan, it is difficult to see what legal steps can or will be taken based on the existing animal legislation. This leads to the question: Taking into consideration the shortcomings of the existing rights-inspired animal welfare legislation, is it possible to suggest alternative legislative models based on other ethical approaches that will ensure real legal protection of animals in situations such as the present KBF case?

Possible alternatives

It is an underlying premise for this analysis that the law should provide for the transformation of ethical principles and moral norms into law when this is the will of the legislature. It further seems a reasonable assumption that it has not been the intention of the lawmakers that egg-laying hens should be left in a normative vacuum as is the case with the rights-inspired provisions mentioned above. Thus, instead of solely relying on a rights-based legislation that in some situations ends up offering no real protection, it may be beneficial to consider how other ethical approaches may be employed, either as a supplement or as a substitute for the rights-model. In the following, we discuss two possible approaches:

A utilitarian approach

Peter Singer’s Animal Liberation (Singer, 1975) and its influential criticism of speciesism was based on a utilitarian approach. In mainstream animal law, however, utilitarianism – and more generally consequentialism – has only had limited influence. Hence, it is reasonable to contemplate whether a legislation based on utilitarianism would be more suited than the current rights inspired approach. In Denmark, animal law is in fact no stranger to utilitarianism as is seen in the legislation on animal testing. According to section 1 [3] of the Animal Test Act (Retsinformation, 2014), animal testing may only be permitted for some specified purposes concerning e.g. health, environmental protection, research, and education. Furthermore, permission may be refused ‘if the experiment is not deemed to be of significant benefit, including if the suffering to which the animal is exposed does not measure up to the usefulness of the experiment and the product’, cf. section 1[5].

Initially it might seem obvious to apply a utilitarian framework instead of a right-based framework, but we are sceptical towards this as a solution. The simplicity of the theory (aim for maximizing welfare across individuals) quickly disappears when faced with the complexity of the many different consequences of animal production. The utilitarian calculus involves comparing factors that are very difficult to compare: How much negative welfare should we ascribe to the animals and on which scale? What models should be employed to calculate the financial gains from the production? Which additional negative and positive factors should be included in the equation (e.g. the environmental and climate effects of the production) and what weight should they be given? How can all the different effects be translated into a comparable scale? And what alternatives should be used to compare? Note that we do not here discuss the legitimacy of the goal of maximizing welfare as the ultimate goal. Here we only wish to point out that from a practical point of view the outcome of the utilitarian calculus is so uncertain that there is

Section 11

no guarantee that it will end up supporting the will of the legislature, as the assumptions made to be able to perform the calculus are not only numerous but also strongly value dependent. One might thus run the risk that whoever actually makes the evaluations and fills in the utilitarian equation will come up with a result that justifies the current production.

We believe that this scepticism is supported by the widespread use of research animals allowed under typically utilitarian frameworks, even though at least some of the uses seems questionable with regard to maximizing welfare (Röcklinsberg *et al.*, 2014). The tendency of overestimating the value (be it economic, nutritional, aesthetic etc.) of the use of animals and underestimating the loss for animal (be it pain, frustration, suffering etc.) resulting from this use and being wilfully blind to the hardships of production animals runs strong in Western culture (Gjerris, 2015). Additionally, the sociozoological scale at work in any society – and thus also when performing the hedonistic calculus – skews the interests of production animals in favour of human interests compared to e.g. companion animals (Arluke and Sanders, 1996). As the results from Kupsala *et al.* (2016) indicate this might be even more the case concerning animals such as hens. Thus, we argue that due to both the unavoidable uncertainty built into the hedonistic calculus and the ‘human factor’ of weighing the scales in our own favour, replacing a right-based legal framework with a utilitarian framework will in all likelihood not offer the animals in question adequate protection.

Approaches based on virtue ethics and ethics of care

Having established the shortcomings of animal legislation based on rights ethics or utilitarianism, it is worth considering whether other ethical approaches may offer a better basis for legal protection of animals reflecting the premise of this analysis: that it has not been the intention of the lawmakers that animals should be left without any kind of legal protection in situations such as the one facing egg-laying hens with KBF. Within animal ethics, for many years there have been strong proponents for relying on e.g. virtue ethics (Hursthouse, 2006; Abbate, 2014) or ethics of care (Donovan, 1996, Donovan and Adams, 2007). Whereas virtue ethics seeks to encompass all relevant virtues, ethics of care stresses the emotional quality of compassion. The two ethical approaches, however, resemble each other in relying on how certain dispositions or moral attitudes inform moral choices, a common denominator being the significance of compassion for other living beings. Therefore, while acknowledging the important theoretical differences, for the present purpose, it will not be necessary to distinguish between the two positions. To apply virtue ethics or ethics of care in legislation, one faces the challenge that these positions do not easily translate into the type of normativity that is characteristic of much legislation, as they are not rule-based theories. They are, however, not apolitical as both Hursthouse (2007) and Donovan (1996) state. The question is thus how to facilitate that the considerations stemming from these perspectives are given a voice within a legal framework. In other words, the task becomes to embed an ethics of care and virtues such as sympathy, justice, mercifulness, compassion, and respectfulness directed towards animals in a legislative framework.

Our tentative suggestion is that this could be done by establishing a council that submits binding opinions on matters that fall outside the scope of clear-cut legislation with regard to animals. The basis for the deliberations of such a council would be to put forth opinions that refer to the aforementioned approach and the relevant virtues and explicate how the decision could be seen to be an expression of these. To avoid special interests hijacking the agenda, the council should ideally consist of lay people assisted by legal scholars, veterinarians, and ethicists. The procedure to be followed by such a council could include the hearing of relevant scientists, organizations (commercial interests, NGO's) etc. Public opinion established through mixed methods in order to establish the opinion of the general public could also be an adequate input in some instances. To ensure that sympathy is properly integrated in the deliberations of the council, there would be a need for council members to witness the animals and

production systems in question directly and to interact with the animals. This would more generally facilitate a sense of responsibility for the animals, not as an abstract notion but as actual living creatures (Andersen, 2015).

It follows from the *raison d'être* of the proposed council that it would be impossible to predict with certainty the outcome of its deliberations in a concrete case. This is a natural consequence of the nature of ethical dilemmas and is, in our opinion, preferable to a situation where the actual legal protection is impotent due to rules pretending to constitute rights while in fact not doing so. However, it would force the council to explicitly state how the relevant virtues are expressed in the decisions and enable a critical discussion not only of the understanding of the virtues, but also the underlying ideals of the preferred relationship between humans and other animals.

Conclusions

As seen in the case of keel bone fractures in egg-laying hens, a right-based approach to animal welfare legislation seems impotent to adequately protect the animals even though the words of the relevant laws seemingly demand so. A utilitarian approach faces several practical issues with relation to the utilitarian calculus that makes it uncertain whether it would have the desired effect. We therefore suggest an ethics of care/virtue ethics-based framework with an independent council able to make binding decisions based on a transparent process where the decisions must be held up against the virtues underlying the council's work as laid down by legislation.

References

- Abbate C (2014): Virtues and Animals: A Minimally Decent Ethic for Practical Living in a Non-ideal World. *Journal of Agricultural and Environmental Ethics* 27: 909-929
- Andersen SS (2015): Proximity: A Levinasian Approach to Justice for Animals. *Global Journal of Animal Law* 1/2015: 1-16
- Arluke A and Sanders CR (1996): *Regarding animals*. Philadelphia: PA Temple University Press
- Danske Æg (2022): Ægproduktion. Danske Æg. <https://www.danskeæg.dk/aegproduktion> (accessed 08.03.22)
- Donovan J (1996): Attention to suffering, Sympathy as a basis for ethical treatment of animals. *Journal of Social Philosophy* 27 (1): 81-102
- Donovan J, Adams CJ (eds.) (2007): *The Feminist Care Tradition in Animal Ethics*. New York: Columbia University Press
- Dyrenes Beskyttelse (2022a): Medlemsmagasinet Dyrenes Beskyttelse. *Dyrenes Beskyttelse*. <https://www.dyrenesbeskyttelse.dk/medlemsblad> (accessed 08.03.22)
- EFSA Panel on Animal Health and Animal Welfare (2015): Scientific opinion on welfare aspects of the use of perches for laying hens. *EFSA Journal* 13 (6): 4131
- FAWC (2010): FAWC opinion on osteoporosis and bone fractures in laying hens. London: Farm Animal Welfare Council. <https://www.gov.uk/government/publications/fawc-opinion-on-osteoporosis-and-bone-fractures-in-laying-hens> (accessed 08.03.22)
- Gjerris M (2015): Willed Blindness: A Discussion of Our Moral Shortcomings in Relation to Animals. *Journal of Agricultural and Environmental Ethics*. Volume 28 (3), pp. 517-532
- Hursthouse R (1999): *On Virtue Ethics*. Oxford University Press
- Hursthouse R (2006): *Applying Virtue Ethics to Our Treatment of the Other Animals* in Welchman J (ed.) *The Practice of Virtue*. Indianapolis/Cambridge: Hackett Publishing Company
- Intergroup on the Welfare & Conservation of Animals (2022): Selective breeding Issues in Livestock Farming. <https://www.animalwelfareintergroup.eu/news/selective-breeding-issues-livestock-farming>.
- Kupsala S, Vinnari M, Jokinen P and Räsänen P (2016): Public Perceptions of Mental Capacities of Nonhuman Animals. *Society & Animals* 24 (5): 445-466
- Kurki V (2021): Legal Personhood and Animal Rights. *Journal of Animal Ethics* 11(1): 47-62

Section 11

- Malling S (2021): Hvordan køber jeg æg, uden at hønen har brækket knoglerne? Danmarks Radio. <https://www.dr.dk/nyheder/indland/hvordan-koerber-jeg-aeg-uden-hoenen-har-braekket-knoglerne> (accessed 08.03.22)
- Midt- og Vestjyllands Politi (2022): Afgørelse af 6. januar 2022 i sagerne mod 4 ægproducenter (j.nr. 4100-89110-00152-21)
- Retsinformation (2014): Dyreforsøgsloven. <https://www.retsinformation.dk/eli/lta/2014/474> (accessed 16.03.22)
- Retsinformation (2020): Bekendtgørelse om dyrevelfærdsmæssige mindstekrav til hold af visse landbrugsdyr. <https://www.retsinformation.dk/eli/lta/2020/1745> (accessed 20.03.22)
- Retsinformation (2021): Lov om dyrevelfærd (dyrevelfærdsloven). <https://www.retsinformation.dk/eli/lta/2021/1597> (accessed 16.03.22)
- Riber AB, Casey-Trott TM and Herskin MS (2018): The Influence of Keel Bone Damage on Welfare of Laying Hens. *Front. Vet. Sci.* 5:6
- Röcklinsberg H, Gamborg C and Gjerris M (2014): A case for integrity: gains from including more than animal welfare in animal ethics committee deliberations. *Lab Anim*, 48: 61-71
- Rodenburg T, Tuytens FAM, de Reu K, Herman L, Zoons J and Sonck B (2008): Welfare assessment of laying hens in furnished cages and non-cage systems: an on-farm comparison. *Animal Welfare* 17: 355-61
- Rufener C and MM Makagon (2020): Keel bone fractures in laying hens: a systematic review of prevalence across age, housing systems and strains. *Journal of Animal Science*, Volume 98, Issue Supplement 1: 36-51
- Singer P (1975): *Animal Liberation, A New Ethics for our Treatment of Animals*. New York: Random House
- Thøfner ICN, Dahl J, Christensen JP (2021): Keel bone fractures in Danish laying hens: Prevalence and risk factors. *PLoS ONE* 16(8)
- Toscano MJ, Dunn IC, Christensen J-P, Petow S, Kittelsen K and Ulrich R (2020): Explanations for keel bone fractures in laying hens: are there explanations in addition to elevated egg production? *Poultry Science* 99: 4183-94
- Wise SM (2019): The struggle for the legal rights of nonhuman animals begins – the experience of the nonhuman rights project in New York and Connecticut. *Animal Law*, 25(3): 367-394

77. The use and misuse of the Universal Declaration of Animal Rights in Portugal

A. Azevedo^{1,2}, M. Whiting³ and M. Magalhães-Sant'Ana^{1*}

¹CIISA, Centro de Investigação Interdisciplinar em Sanidade Animal, Faculdade de Medicina Veterinária, Universidade de Lisboa, Avenida da Universidade Técnica, 1300-477 Lisboa, Portugal; ²ICBAS, Instituto de Ciências Biomédicas Abel Salazar, Universidade do Porto, R. Jorge de Viterbo Ferreira 228, 4050-313 Porto, Portugal; ³CVS (UK) Ltd, CVS House, Owen Road, Diss, Norfolk, IP22 4ER, United Kingdom; mdsantana@fmv.ulisboa.pt

Abstract

The Universal Declaration of Animal Rights (UDAR) was proclaimed in 1978 at the United Nations Educational, Scientific and Cultural Organization (UNESCO) headquarters, with the ambition of later being adopted by the United Nations. The UDAR was substantially revised in 1989 to improve its credibility but was never proclaimed by the UNESCO, and has failed to be adopted by any relevant international organisation. Despite having little influence in English-speaking countries, the UDAR is frequently cited as universally accepted or legally binding in some jurisdictions. In this study, we present data from Portugal illustrating the use of the UDAR in the country's official legal gazette (*Diário da República*), in society and in veterinary practice. The most common misconceptions found were the attribution of the endorsement, approval or promotion of the UDAR to UNESCO and the assumption that it is universally endorsed or that it has legal value. None of the citations mentioned the 1989 version of the Declaration, probably due to replication of errors from other sources. The substantial influence of the UDAR illustrated by our data suggests that the *zeitgeist* of animal protection in Portugal is strongly influenced by an animal rights ethic. Moreover, specific examples of the UDAR's use illustrate its strong (and perhaps distinctive) influence on the Portuguese veterinary community. However, the frequent misuse of the UDAR in legal documents and daily veterinary practice might be conveying a sense of personal moral justification in relation to how animals are treated that is not legitimised by international treaties.

Keywords: animal law, animal ethics, animal rights, UDAR

Introduction

The Universal Declaration of Human Rights (UDHR) is perhaps one of the most impactful documents of recent human history. The declaration emphasizes human dignity and establishes ethical boundaries that (aim to) promote social fairness on a global level. Violations of the UDHR are ubiquitously considered ethically unacceptable with resounding political and social consequences. For over a century, animal advocacy has sought to establish a similarly universal code of conduct towards animals that could shape the way humans perceive and treat animals worldwide (Neumann, 2012). As a result, the Universal Declaration of Animal Rights (UDAR) – inspired by the animal rights movements since the second half of the eighteenth century – was adopted by the 'Ligue Internationale des Droits de l'Animal' (LIDA) and its affiliated national leagues in 1977, and proclaimed at the UNESCO headquarters in 1978 (La Fondation Droit Animal, Ethique et Sciences, 2021). The declaration was substantially revised in 1989 to improve its credibility, and made public in 1990 (Chapouthier and Nouët, 1998).

However, the proponents' goal of making it a universally endorsed moral code setting the standards for how animals are treated was never achieved. To date, the UDAR has not been endorsed by countries in

Section 11

the context of the United Nations, or otherwise. Additionally, the principles of the declaration have not been translated into international treaties on animal protection or use, thus failing to achieve practical or legal significance. Several reasons have been pointed out for the UDAR's failure to gain traction, ranging from a lack of support and financial resources of the LIDA, its francophone origin, potential conflicts with economic interests related with animal use, and lack of consensus (Neumann, 2012). In practical terms, the UDAR is antithetical to the prevailing paradigm that stems from an expanding global human population heavily dependent on animal use for food and livelihoods.

While the UDAR has little influence in English-speaking countries (Neumann, 2012), it does seem to have a presence in the *zeitgeist* of some European countries that transcend its original animal rights advocacy. In such cases, citations of the UDAR can be found in official regulations, in court rulings and in the daily activity of animal-related activities. However, citations are not always precise, and the UDAR is often conveyed as universally accepted, legally binding and proclaimed or endorsed by the UNESCO or the UN (González, 2018). The trigger for our study was one such citation that the authors came across while reading a technical report for a Project of Law (a bill proposed by Members of Parliament) that aimed to ban live-pigeon shooting in Portugal (Dias, 2021). In that report, the UDAR was cited in the international comparative law section under the header 'UNESCO'. This raised the question of whether the UDAR was being mentioned in official Portuguese animal protection regulations, and if so, whether these citations were rigorous.

Using the case of Portugal, we provide evidence of the current use (and misuse) of the UDAR. First, we present a review of the mentions to the UDAR in the country's official legal gazette (*Diário da República*) in the past 20 years. We provide an analysis of UDAR citations in the gazette focusing on their context and on potential errors or imprecisions when mentioning the declaration. Next, we provide examples of the use of the UDAR in society and particularly in the context of veterinary medicine, a profession that is critically placed at the intersection between animal use and animal protection. Finally, we explore the implications of our findings.

Methods and results

The UDAR in Portugal's official legal gazette

The *Diário da República* is the official gazette where enacted laws and regulations are published (www.dre.pt). All documents published in the first series of the gazette since 1910 (e.g. Laws, Decree-laws and Constitutional Court decisions) and in the second series since 2000 (e.g. Regulations and public contracts) are freely available online. In order to answer our research questions, we conducted a search of all documents available on the online gazette with the exact term 'Declaração Universal dos Direitos dos Animais'. For each result, we collected the title, the institution that emitted the document, and the specific sections of text that contained the citation of the UDAR. Next, we assessed the text for accuracy when citing the UDAR and analysed the results by type of institution, context, and frequency and type of errors in citations. The full details (including text excerpts) of the search are available upon request to the authors.

We found 36 results for the term 'Declaração Universal dos Direitos dos Animais'. Among the results, 23 were local authority ordinances issuing or altering animal welfare and protection regulations. Eight were publications of the establishment of animal protection associations and five were related with court rulings. Seven of the eight results establishing the animal protection associations (the remaining one was inaccessible) requested that associates aligned with or endorsed the UDAR but did not specify to which version of the declaration they were referring to. Three out of the five court rulings contained false or misleading claims, specifically that the UDAR is universally endorsed or that it has legally

binding value, with (n=2) or without (n=1) the attribution of its proclamation or endorsement to the UNESCO. The two remaining judicial texts contained misleading claims about the UDAR on behalf of the plaintiffs, but not by the official authority. In terms of animal protection and welfare regulations issued by municipalities (local authorities), only two of the 23 texts were free of false or misleading claims. The remaining 21 (91%) search results attributed the proclamation, endorsement or approval of the UDAR to UNESCO, and 20 of them assumed the declaration to have universal endorsement or binding value. All documents refer to the declaration as approved in 1978.

The UDAR in Portuguese society and in the veterinary profession

Following our findings in the official gazette, the question was raised about the use of the UDAR in Portuguese society in general. A prospective search web search was performed for the exact term 'Declaração Universal dos Direitos dos Animais' using the Google search engine. In order to avoid search *biases* from personal navigation history, the personalized search results function of the search engine was turned off. In order to include only results in Portuguese language from the region 'Portugal', the terms 'Brasil', 'Brazil' and 'br' were excluded in the search inputs.

The first result listed was the website of the Portuguese League for Animal Rights. Surprisingly, websites of veterinary practices were the most represented group (n=4) in the ten most popular search results, followed by municipalities (n=2). The remaining three results included an article on animal rights from a legal column in a university newspaper (Machado, 2021), a slide presentation on the UDAR by a school student, and a technical report from the Commission for constitutional matters, rights, freedoms and guarantees of the Portuguese Parliament (Comissão de Assuntos Constitucionais, Direitos, Liberdades e Garantias, 2016). The first ten results of the web search are provided in supplementary materials (S3). All except two of the first ten search results contained imprecise citations, attributing the proclamation, endorsement or approval of the UDAR to UNESCO or the UN. The exceptions were the student presentation and one of the websites from a veterinary practice. All retrieved websites (but three) reproduce the 1978 version of the UDAR (the remaining three allude only to its approval in 1978) and none mention the 1989 version.

The technical report from the Commission for constitutional matters, rights, freedoms and guarantees of the Portuguese Parliament referred to the pre-legislative assessment of a project of law for the revision of the legal status of animals in the Portuguese Civil Code (Comissão de Assuntos Constitucionais, Direitos, Liberdades e Garantias, 2016). It mentioned the UDAR in the section of comparative law, under the header 'international organizations' and specifically cited it as being approved by UNESCO. The article on animal rights from the legal column of the university journal went even further, stating that 'the main text in international law in terms of animal protection is the Universal Declaration of Animal Rights, approved under the aegis of UNESCO on January 27th, 1978' (Machado, 2021). On the website of the Portuguese League for Animal Rights, the 1978 version of the UDAR was also cited as approved by UNESCO and posteriorly by the UN (www.lpda.pt/declaracao-universal-dos-direitos-animal/). The websites of both municipalities cited the UDAR as proclaimed by UNESCO. Among the four websites of veterinary practices, all but one cited the UDAR as approved by UNESCO and the UN, and one stated the declaration 'has been endorsed by several countries that strive to enforce it'. Finally, the 1978 version of the UDAR can be found on the companion animal official health bulletin. The format and contents of the official health bulletin are set forth in national legislation (Despacho n.º 8196/2018, 2018), edited exclusively by the Portuguese Veterinary Order (*Ordem dos Médicos Veterinários*) and printed by the Portuguese Mint and Official Printing Office (*Imprensa Nacional e Casa da Moeda*). Although the official health bulletin contains no claims regarding the declaration's authorship or endorsement, it fails to mention the version of the declaration (Figure 1).



Figure 1. Cover and back matter of the Portuguese official companion animal health book, featuring the 1978 version of the Universal Declaration of Animal Rights.

Discussion or concluding remarks

This work presents qualitative data illustrating the influence of the UDAR in Portugal drawing examples from legislation, society and veterinary practice. We found false or misleading claims that the declaration was either proclaimed or endorsed by the UNESCO and the UN in up to 91% of the cases (e.g. in 21/23 animal protection regulations by municipalities). These unsubstantiated citations could underpin the more expressive cases where the UDAR is treated as part of international law. Three examples of this type of use include its consideration in the sections of comparative law in at least two pre-legislative technical reports by commissions from the Portuguese Parliament, its mention as being the main international text in animal protection law in a legal column from a university newspaper, and its presence on the back matter of the government-issued Portuguese companion animal health bulletin.

Other authors have previously reported imprecise mentions or citations of the UDAR in regulatory documents. In an essay relating the UDAR with animal protection legislation, González (2018) gives some examples, and admits to have made the same error himself in the past, a frequent imprecision he attributes to the emotion that often drives work related with animal protection. One of the interesting examples he provides refers to an essay comparing animal welfare legislation in the United States of America and the United Kingdom where the UDAR – cited as approved by the UNESCO and the United Nations (UN) – is used as a reference point for the comparison (Rodríguez, 2010).

The citations in the official gazette that were identified in this work were related with companion/shelter animals. Similarly, mentions from the veterinary field all came from companion animal practice, and the regular presence of UDAR posters in practices waiting rooms are another example. However, the most striking example of the influence of the UDAR in companion animal practice in Portugal is the presence on the back matter of every companion animal health bulletin in the country (Figure 1). This government-issued document that was designed and endorsed by the Veterinary Order is distributed to every dog or cat owner by practicing veterinarians, making it remarkable example of the UDAR's

influence in Portugal. These findings are aligned with the *zeitgeist* of an animal rights ethic when it comes to companion animals, where the principles of the declaration do not conflict – and actually align with – an anthropomorphic view that most people have of their companion animals (Horowitz and Bekoff, 2007; McConnell *et al.*, 2016, 2019). Results also suggest that the confusion regarding the UDAR's proclamation and endorsement extends to the veterinary profession, at least in the field of companion animals.

The absence of mentions to the UDAR when it comes to production animals is indicative of the challenges that arise when attempting to apply the UDAR's principles to farming contexts. In the context of agriculture, it is difficult to find a morally consistent approach to animal rights other than abolitionism (Wrenn, 2012). However, an animal protection or animal welfare orientation seems to be the most prevalent among meat consumers (Lund *et al.*, 2016, 2021). Hence, the absence of mentions of the UDAR in regulations targeting production animals is unsurprising as an animal rights ethic would exacerbate the cognitive dissonance allegedly associated with meat consumption, known as the 'meat paradox' (Bastian and Loughnan, 2017).

It is noteworthy that both technical reports from commissions of the Portuguese Parliament containing imprecise citations of the UDAR involved species other than cats and dogs, specifically pigeons in the context of sport-shooting and the legal status of animals *latu sensu* in the Civil Code. The misconceptions observed when citing the UDAR in these reports could be due to replication of errors from their sources. This could also help explain why the version of the cited declaration is often not provided and, when it does, the 1989 (and definitive) version of the UDAR is never mentioned.

Irrespective of the associated errors, the citation of the UDAR in the legislative process is indicative of animal rights advocacy's role in driving changes in regulation. Given the changes in attitudes of humans toward animals over the last decades, with companion animals becoming part of the family (McConnell *et al.*, 2019) and the concurrent alienation of production animals 'from husbandry to industry' (Rollin, 2011), it is expectable to see a larger expression of an animal rights ethic in companion animal regulation. Finally, errors in the official gazette when citing the UDAR were more frequent in local authority ordinances than in documents from animal protection associations and court rulings. The qualitative and prospective nature of this work warrants caution when interpreting these findings. Further study is necessary to ascertain whether this trend is related with a lack of literacy in the field of animal protection in certain circles of the legislative process, while other areas that are subject to detailed scrutiny are able to avoid making or replicating errors.

International declarations have no legally binding value. However, they establish moral principles that are expected to inspire legislation and find commitment by governments through endorsement. For example, the Universal Declaration of Human Rights represents the universal recognition of human rights and has inspired global human rights law and is endorsed by most countries in the World. The Universal Declaration of Animal Rights is said to have found very little, if any, public support but our results suggest otherwise, at least in the case of Portugal. Despite no official endorsement, the UDAR has influenced and is mentioned (albeit with errors) in legislation published in the official gazette, where it has been used as a reference in companion animal protection ordinances and technical reports by parliamentary commissions. This influence is consistent with a presence of an animal ethics in the companion animal *zeitgeist*, illustrated by appearances of the UDAR on the official companion animal health bulletin and websites of veterinary practices. However, it is also consistent with erroneous use due to a generalized misperception that it is endorsed by UNESCO or other countries and legally binding. Either way, the misuse of the UDAR in animal protection legislation carries the risk of providing a sense of moral security as to how animals are treated in Portugal that finds no practical support in national or international law.

Acknowledgements

M.M.-S. is supported by the research project *VETHICS 2022: A structured approach to describing and addressing the ethical challenges of the veterinary profession in Portugal* (SFRH/BPD/117693/2016), funded by Fundação para a Ciência e a Tecnologia (FCT), Portugal and the European Social Fund.

References

- Bastian, B. and Loughnan, S. (2017). Resolving the meat-paradox: a motivational account of morally troublesome behavior and its maintenance. *Personality and Social Psychology Review*, 21(3), 278-299.
- Chapouthier, G. and Nouët, J.-C. (1998). *The universal declaration of animal rights: Comments and intentions*. Ligue Française des Droits de l'Animal: Paris.
- Comissão de Assuntos Constitucionais, Direitos, Liberdades e Garantias. (2016). Parecer do Projeto de Lei n.º 164/XIII/1.ª (PS). Assembleia da República.
- Dias, J. (2021). Parecer – Projecto de Lei 681/XIV/2 (PAN). Comissão de Agricultura e Mar, Assembleia da República. Despacho n.º 8196/2018, (2018). Available at: <https://files.dre.pt/2s/2018/08/160000000/2327023276.pdf>. Accessed 24 January 2021.
- González, F.J.C. (2018). La Declaración universal de los derechos del animal. *Derecho Animal. Forum of Animal Law Studies*, 9(3), 143-146.
- Horowitz, A.C. and Bekoff, M. (2007). Naturalizing Anthropomorphism: Behavioral Prompts to Our Humanizing of Animals. *Anthrozoös*, 20(1), 23-35.
- La Fondation Droit Animal, Ethique et Sciences. (2021). La Déclaration universelle des droits de l'animal. La Fondation Droit Animal, Ethique et Sciences. Available at: <https://www.fondation-droit-animal.org/la-fondation/declaration-universelle-droits-de-lanimal/>.
- Lund, T.B., Denver, S., Nordström, J., Christensen, T. and Sandøe, P. (2021). Moral convictions and meat consumption – a comparative study of the animal ethics orientations of consumers of pork in Denmark, Germany, and Sweden. *Animals*, 11(2), 329.
- Lund, T.B., McKeegan, D.E.F., Cribbin, C. and Sandøe, P. (2016). Animal Ethics Profiling of Vegetarians, Vegans and Meat-Eaters. *Anthrozoös*, 29(1), 89-106.
- Machado, I. (2021, April 1). Quid JUP: O Direito dos animais. *Jornal Universitário do Porto*. <https://www.juponline.pt/politica/quid-jup/artigo/38679/o-direito-dos-animais.aspx>
- McConnell, A.R., Lloyd, E.P. and Buchanan, T.M. (2016). *Animals as friends*. In *The Psychology of Friendship*. Oxford University Press.
- McConnell, A.R., Paige Lloyd, E. and Humphrey, B. T. (2019). We are family: viewing pets as family members improves wellbeing. *Anthrozoös*, 32(4), 459-470.
- Neumann, J.-M. (2012). The Universal Declaration of Animal Rights or the creation of a new equilibrium between species. *Animal Law*, 19, 63-109.
- Rodríguez, B.L. (2010). Legislación inglesa y norteamericana: Derecho Animal. *DA. Derecho Animal. Forum of Animal Law Studies*, 1(1), 1-158.
- Rollin, B.E. (2011). Animal Rights as a Mainstream Phenomenon. *Animals*, 1(1), 102-115.
- Wrenn, C. (2012). Abolitionist Animal Rights: Critical Comparisons and Challenges Within the Animal Rights Movement. *Interface*, 4(2), 438-458.

78. Doing interdisciplinarity blind: on the impossibility of naturalist applied ethics

K. Eckl* and H. Grimm

University of Vienna, Universitätsstr. 7, 1010 Wien, Austria; Messerli Research Institute, University of Veterinary Medicine, Vienna, Medical University Vienna, University Vienna, Vienna, Austria; konstantin.eckl@univie.ac.at

Abstract

In applied ethics in general, and in applied animal ethics in particular, there is a prevalent presumption that there are states of affairs which are morally wrong or right, independent of any person's value judgment to that effect. At the same time, there is a general commitment within that discipline to a scientific naturalist worldview and the interdisciplinarity with the empirical sciences that this entails. These commitments to special, unconditional, moral normativity on the one hand, and to scientific naturalism on the other, stand in conflict with each other as soon as the question of the justification of normativity arises. We claim that many, and perhaps all, of the most popular responses to this tension, do not resolve it, but simply export it outside the area of discourse. Once examined, the tension always arises again. Using the debate around fish pain as an illustration, we will give three examples for particularly popular modes of response and demonstrate how they merely black-box the problem, rather than solve it. This indicates that the prospect of solving the tension is slim, and that a theory interested in upholding the unconditional normativity of morality should deal with their incompatibility with naturalism head-on, rather than obscure it.

Keywords: metaethics, naturalism, animal ethics, objectivism, subjectivism, normativity

Introduction

There is a prevalent presumption within applied ethics that the role of the applied ethicist consists in mediating between competing value sets in such a way that the value judgement of one will emerge as the morally correct position. This realist presumption, which we will term the assumption of 'unconditional normativity' for reasons which we will outline in the section below, stands in tension with another core commitment of applied ethics, that of interdisciplinarity with the empirical sciences.

The only way these two commitments can coexist without dropping one in favour of the other is, as we will outline, the exportation of the source of normativity into an unexamined blind-spot, removed from the discourse on the particular ethical problem. We will talk about three ways in which such an exportation of justification of normativity frequently occurs in applied ethics. We will do this using the example of the issue of whether fish can feel pain, which is still controversial in the literature. We will conclude that this turning of a blind eye to normativity is deeply unsatisfying, and that applied ethics, where it wishes to avoid non-cognitivism and subjectivism, must openly deal with the non-naturalist implications that follow from that commitment.

The positions relevant to this text are those positions of applied ethics which subscribe to two notions, both of which could be argued, for different reasons, to be of central importance for applied ethics. On the one hand, the notion that morality exhibits a special unconditional kind of normativity and on the other hand the notion that applied ethics must be interdisciplinary with the natural sciences. We will go into how we understand these terms next.

Terminology

Interdisciplinarity

When we talk about ‘interdisciplinarity’, we mean the taking into account and usage of the findings and methods of one discipline in the research practice of another. In the case of applied ethics, this means taking into account the findings of the empirical sciences, when dealing with moral problems of social reality. Contemporary applied ethics have an interest in being interdisciplinary because in contemporary Western society, scientific naturalism is an all but hegemonic worldview. This means that in Academic discourse, there is a common presumption of the *Absolute Epistemic Primacy* (EP) of the natural sciences over other modes of inquiry. EP is a methodological assumption within Academic discourse which dictates that if two theories are in conflict, their respective degree of agreement with empirical findings is the primary factor for deciding their plausibility. In other words, it is the commitment that the better a theory is supported by scientific evidence, the more plausible it is, regardless of its support by alternative forms of inquiry, such as religious or abstract philosophical inquiry. As such, the assumption of EP is a necessary component of any form of scientific naturalism as the term is commonly understood. As an example, a hypothetical holy book’s claim that animals do not possess souls and that they therefore cannot feel pain will generally be considered to be less plausible than the scientific claim that certain animals’ brain structures suggest that they are capable of experiencing pain. In Western academic discourse, even a well-argued philosophical account will be taken to be implausible if it contradicts scientific evidence or if there is even just an alternative explanation which is more rooted in scientific evidence. A philosophical theory about animal pain that takes into account neuroscientific findings is always *prima facie* more plausible than one which ignores such findings, even if it does not actively contradict them. Philosophers must give scientific data epistemic priority over other kinds of data and knowledge or risk being considered unscientific, thereby removing themselves from serious academic discourse. Hence, applied ethics is obliged to be interdisciplinary, as soon as findings of the natural sciences are of relevance to its work.

It is important to note here that the truth or falsity of naturalism, or whether EP is a justified assumption, is not at issue here; Rather, what we are referring to here is the social reality that within large parts of Western Academic discourse, a theory’s agreement with the empirical sciences is an all but trumping plausibility condition. We are not asserting that if one theory is more strongly supported by scientific evidence, it is necessarily better than one which has less or no scientific evidence behind it. Rather, we claim that as a matter of fact, theories with more scientific backing *are* given more plausibility, and that positions which do not give the empirical sciences epistemic primacy therefore *are*, as a matter of fact, confronted with issues of plausibility in contemporary Western Academic discourse. All positions we use as examples, at any rate, argue in line with the assumption of EP. Such positions which do not hold that a rival’s stronger backing by the natural sciences is a decisive problem for them are not internally afflicted by the problems we discuss, although they will be faced with outside challenges from the Academic community.

Unconditional normativity

‘Unconditional normativity’ is our term for what Elizabeth Anscombe (1958) calls ‘the moral ought’. This is the idea that morality possesses a special normativity which is not further conditional on or reducible to non-moral descriptive facts. It posits that there are certain types of states of affairs, the tokens of which are good or bad *simpliciter*, simply by virtue of belonging to those types of states of affairs. We put this term in opposition primarily to the position of subjectivism. Subjectivism holds that for something to be morally good or evil is equivalent to it being considered good or evil by an agent or society under certain, ‘ideal’ conditions stipulated by the particular theory. Subjectivism thereby makes

moral normativity conditional on the descriptive facts of psychology and sociology, equating it with the psychological pull of subjectively held values. The way subjectivism is understood here, it is a *reductive* doctrine, meaning that it does not state that an action or state of affair's being held to be good endows that action or state of affairs with some additional, special moral normativity, or that what is good or bad *simpliciter* is the personal value judgment. Rather, it is the position that any statements about morality reduce to psychological or sociological facts about evaluations, and that the normativity they possess is that psychological or social force which such evaluations exert on agents as a matter of observable fact. So subjectivism, as it is understood here, does not argue that moral judgments gain special justification from being endorsed, but rather that there *are* no special justification condition for moral judgments outside of them fulfilling the criteria of matching the description of a moral judgment. Idealization conditions such as Sharon Street's internal consistency check of one value 'standing up to scrutiny' against the agent's greater value set are not to be understood as tests of a moral judgment's veracity, but merely of a judgment's agreeability from the perspective of that agent. This absolves subjectivism of having to justify how moral normativity can arise from descriptive facts about the world. All it has to do is point at the psychological facts about evaluative attitudes and, at most, give them a 'formal characterization', which is to say to 'merely explicate what is involved in valuing anything at all' (Street, 2012, 40). This should be kept in mind when we talk about the advantage of subjectivist theories in naturalistic justificatory discourse; Their advantage is not that their proposed normative facts are better supported by the scientific evidence, but that they are *equivalent* with pieces of scientific evidence. Some (as for example Parfit (2011)) may argue that this kind of subjectivism is a kind of moral nihilism. We will not take a stance on that point here.

The question of unconditional normativity has special relevance from the standpoint of applied ethics because it allows for concrete and objective decisions between two value judgments, something which is frequently presupposed by applied ethical discourse. Unconditional normativity can allow, for example, for the pain of animals to be taken as morally relevant as such, meaning torturing animals would be wrong, regardless of the perspective one takes. Without such normativity, the ethicist can only rely on polling the actually held values of the involved parties, making the moral badness of causing pain dependent on people's opinion on it and a definite decision between them, or what is right independently of them, is seemingly impossible.

The tension

The combination of these two commitments poses an obvious problem: the natural sciences produce exclusively descriptive statements and therefore cannot yield normative facts which are not further reducible to such descriptive statements. This would include, for example, statements about subjective value judgments. Therefore, a theory with maximal agreement with the natural sciences, and therefore maximal plausibility according to EP, will not include references to subject-independent normativity which, by definition, refuses such reduction. Endorsing EP, then, implies the abandonment of unconditional normativity.

Perhaps the most obvious solution to this problem is to meet it head on, and to drop the commitment to the unconditional ought, embracing subjectivism (e.g. Street, 2012). This reduces the normativity involved in ethics to the subjective value systems of people or societies. Subjectivists thereby reduce moral normativity to the descriptive facts of psychology or sociology. As we have said above, however, abandoning unconditional normativity is highly unsatisfactory for the actual practice of applied ethics, since we often do not simply want to know what people hold to be right, but which one of two competing judgement on what is morally right is the correct one in a given situations. This implies going beyond agents' personal or societal evaluations; embracing subjectivism would make this kind of applied ethical practices untenable.

Section 11

Applied ethicists who, for this reason, hold on to unconditional normativity are left in a situation where they must apply empirical, entirely descriptive data to a framework which can only function if the epistemic status of that data is relativized. However, just this elevated epistemic status, its epistemic primacy, is the reason for its inclusion in the first place. Adopting the absolute epistemic primacy of the natural sciences in application, but not in justification, is equivalent to not adopting it at all.

Modes of response

If a position does not want to drop unconditional normativity and embrace subjectivism, it will have to somehow deal with this tension. It will have to endow descriptive statements with normative implications and will have to do so without exiting the naturalist arena of contemporary discourse. As we will argue, in applied ethics, this most often happens in the background, without reflection or at least unexamined. Hence, applied ethicists might run the risks of black-boxing the issue of normativity in order to not put themselves into conflict with their naturalist commitments. In the remainder of this text, we will be talking about three such modes of responding to this tension, to show how ethicists transplant the issue of normativity outside the space of discourse where EP is consistently applied. For this purpose we will make the example of animal pain, which we have been using so far, more concrete. Specifically, we will make use of the current scientific debate on whether fish can feel pain.

It is highly implausible to seek to answer the question of pain of fish without consulting the natural sciences. Further, the answer to this question, although not itself normative in nature, is held to be morally relevant by many. At the same time, the corresponding scientific evidence, as well as its interpretation, is complex and still partially inconclusive (compare Segner, 2012; Wild, 2012; Key, 2016) and has been historically shifting. This makes it an excellent illustrative case study for the present purposes.

Uncritical acceptance

The first mode of response we want to take a look at we term ‘uncritical acceptance’. Uncritical acceptance assumes certain data to already have normative implications qua being that kind of data. Uncritical acceptance means pointing to the fact that fish brains contain similar structures as the pain centres in mammal brains and concluding: it follows that fish are morally relevant. Joshua Greene is known for having taken neurological evidence of more focused cognitive functions favouring utilitarian judgments and more taxed cognitive functions leading to deontological judgments, and concluding from this that utilitarianism is more likely to be the result of ‘rational’ deliberation, and therefore more likely to be morally correct than is deontology (Greene, 2001). There are, with (early) Greene, no normative theories involved in this analysis which would justify, for example, that rationality of a judgement is a precondition for its normative salience. Rather, it takes this premise as being obviously inherent in the facts. The problem with such an approach is obvious. Without normative theory backing it up, its implications are under-determined, and it can be used as much to oppose the killing of fish by pointing at their brains as it can be used to justify it by pointing at human evolutionary history (Kluger, 2016). In the end, uncritical acceptance does not circumvent justification; Rather it simply moves it into a blind spot; not talking about it but necessarily assuming it. Greene himself had to relativize his conclusions for this reason later on, stating that to get from scientific evidence to moral judgments we ‘need an additional, nonscientific normative assumption’ (2014, p. 711).

To get to such normative assumptions, the naturalist who utilises uncritical acceptance has then two options: either they admit that the normative content of the new data is based in the personal or societal preconceptions of the researcher or evaluator, which would lead to subjectivism; or they move to endorse a pre-existing normative theory which explains why their data has normative implications. This constitutes the second response we want to talk about, *critical reception*.

Critical reception

‘Critical reception’ takes the empirical data and engages with it in much the same way as disciplines of the empirical sciences engage with each other’s data in interdisciplinary work. In effect, this means taking empirical data and slotting it into *a priori* formulated ethical theories, much as one would parameterise into a model, for it to return a moral judgement. In the critical reception of empirical data, the normative implications can change according to the nature of the empirical evidence. What kind of implications follow from what kind of evidence is predetermined by reference to *a priori* philosophical theories. Those theories, in turn, are either not themselves informed by empirical facts or informed by them in a way which justifies their normative salience *a priori* as well. The perfect example for this is Peter Singer, who relies on a report not dissimilar to that commissioned by the EKAH for the inclusion of fish in the moral community in his influential *Animal Liberation* (1975, p. 172).

This course of action is certainly useful, and widely used, but its engagement with empirical data stops short of involving it in the justification of moral normativity. Applied ethics, where it relies on critical reception, already comes to the application of ethics with the presumption that *a priori* philosophy has epistemic primacy over the natural sciences and can be used instead of purely empirical, that is to say psychological, sociological or evolutionary, modes of talking about ethics. Just like with uncritical acceptance, critical reception is a strategy which exports the justification of empirical data’s normative relevance to a prior normative framework, the compatibility with EP is not questioned. Once examined, that prior normative framework brings applied ethics again into conflict with EP.

Retreat

‘Retreat’ from justificatory discourse is a way of avoiding the theoretical implications of this exportation of normative justification. Here, the ethicist declines to make a judgement on the justificatory background of an ethical theory and instead treats it as hypothetically true. This way, not only the empirical data but also its normative implications are variable parameters. The furthest such a position would go in making normative pronouncements is to say: IF it is true that fish feel pain AND IF it is true that pain is morally relevant, THEN fishing practices must be reformed IF they cause pain. Onora O’Neill diagnoses a tendency for *Retreat* moves in applied ethics when he says that ‘[a] fair amount of work in ‘applied’ ethics takes for granted established legal frameworks, the norms of established professional cultures’ as an ‘argument from authority’ (O’neill, 2009). While he takes this to be a ‘defect’, Ives and Dunn (Ives and Dunn, 2010) hold that such an argument from authority is unavoidable in applied ethics, and that the best applied ethics can do is make the second IF clause in our above example explicit. They do not see the conditionality of applied ethics as a defect, but as a necessary feature. Similarly, in the Oxford Handbook of Food Ethics, the entry on fish ethics states that it ‘take[s] no stand on which [...] features actually matter [morally]’ (Michaelson and Reisner, 2018). Instead, the authors offer a number of possible models to show which normative assumptions would lead to which conclusions given the scientific evidence. While there, this can be chalked up to space constraints, there are a number of tools within applied ethics (e.g. Biasetti and de Mori, 2021) which offer multiple models of making moral judgments while explicitly not taking a stance on their comparative validity.

Retreat from discourse about the morally right or good may very well be the most honest way of responding to the tension. It admits its justificatory blind spot and makes no attempts to cover up the fact that the source of the normativity relied upon is opaque. This honesty, however, cannot avoid the fact that it is no less unable to square the demands of EP with morality’s unconditional normativity. *Retreat* declines to make any attempt at such a squaring, but this does nothing to absolve its normative assumptions from a lack of scientific plausibility.

Conclusions

We have argued that the incompatibility of unconditional moral normativity and naturalism is a problem which is not only relevant for abstract normative theory, but also for applied ethics, where it represents a largely unsolved problem. We have shown, using examples, that there is reason to question the feasibility of the project of doing naturalist applied ethics without descending into subjectivism. We have also argued why, from a certain understanding of its role, this is tantamount to giving up on applied ethics as a whole. We hold that this would be a mistake.

We are not suggesting that science needs to be disregarded in applied ethics. We rather claim that applied ethics should be clear in its understanding of the fact that if it wants to keep the cognitivist preconceptions that are implied by its very practice, it will have to be critical of the epistemic primacy of the natural sciences. Because of this, it will be obliged to deal with, and develop coping mechanisms for, the crisis of plausibility that this entails, which goes beyond the scope of this paper.

References

- Anscombe, G.E.M. (1958) Modern Moral Philosophy. *Philosophy* 33: 1-19.
- Biasetti, P. and de Mori, B. (2021) The Ethical Matrix as a Tool for Decision-Making Process in Conservation. *Frontiers in Environmental Science*, 9.
- Greene, J.D. (2001) An fMRI Investigation of Emotional Engagement in Moral Judgment. *Science*, 293: 2105-2108.
- Greene, J.D. (2014) Beyond Point-and-Shoot Morality: Why Cognitive (Neuro)Science Matters for Ethics. *Ethics* 124: 695-726.
- Ives, J. and M. Dunn. (2010) Who's Arguing? A Call for Reflexivity in Bioethics. *Bioethics* 24 (5): 256-265. <https://doi.org/10.1111/j.1467-8519.2010.01809.x>.
- Key, B. (2016) Do fish feel pain? *Australasian Science* 37 (3): 30-33.
- Kluger, J. (2016) Sorry Vegans: Here's How Meat-Eating Made Us Human. *Time*. Available at: <https://time.com/4252373/meat-eating-veganism-evolution/>. Accessed 5 March 2022.
- Michaelson, E. and Reisner, A. (2018) Ethics for Fish. In A. Barnhill, M. Budolfson and T. Doggett, Eds., *The Oxford Handbook of Food Ethics*. Oxford Handbooks Online, Oxford. 10.1093/oxfordhb/9780199372263.013.22
- O'Neill, O. (2009). Applied Ethics: Naturalism, Normativity and Public Policy. *Journal of Applied Philosophy* 26 (3): 219-30. <https://doi.org/10.1111/j.1468-5930.2009.00446.x>.
- Parfit, D. (2011) *On What Matters: Volume One*. Oxford: New Oxford University Press.
- Segner, H. (2012) *Fish: Nociception and pain A biological perspective*. FOBL, Bern, 108 pp.
- Singer, P. (1975) *Animal Liberation*. Ecco Pr, New York 324 pp.
- Street, S. (2012) Coming to Terms with Contingency: Humean Constructivism about Practical Reason. In: J. Lenman and Y. Shemmer, (eds.) *Constructivism in Practical Philosophy* Oxford University Press, Oxford, pp. 40-59.
- Wild, M. (2012) *Fische: Kognition, Bewusstsein und Schmerz Eine philosophische Perspektive*, FOBL, Bern, 204 pp.

79. Challenges faced by the EU regulatory framework on GMOs after the ECJ ruling on mutagenesis

L. Escajedo San-Epifanio

University of the Basque Country, Department of Public Law, Historical-Legal Sciences and Political Thought, Faculty of Labour Sciences and Social Work, 48080 Bilbao, Spain; leire.escajedo@ehu.es

Abstract

The Ruling of the ECJ on new plant breeding techniques (case C-628/16, published in 2018) opened in Europe an intense reflection on the regulatory framework that since 2001 has been applied to GMOs in the EU. Focusing on the tensions that have been generated over decades by the above-mentioned regulatory frameworks, this paper analyses the key elements of the ECJ ruling and its implications for the future of new plant breeding techniques within the EU. Special attention is paid to the use that the ECJ made of the precautionary principle as well as to the variety of reactions that have been expressed in its view.

Keywords: plant breeding, industrial property, environmental risk management, common agricultural policy, non-human biotechnologies, GMOs

The absence of a holistic regulatory framework for plant breeding in the EU

In 2014, the European Parliament (EP) published a 'Resolution on Plant Breeding' (EP, 2014). In it, it recognizes that the plant breeding sector is of fundamental importance in relation to productivity, diversity, health and quality of agriculture, horticulture and food and feed production, as well as in terms of environmental protection. According to the latest published data, in the European seed sector alone, more than 50,000 people work in the EU, 25% of them in R&D&I activities (ANOVE, 2021), although the impact of their activity extends to the entire agri-food system. In the opinion of the EP (2014), the attention paid to it by the European Union (EU) does not correspond to this importance.

Seven years after the above-mentioned Resolution, a study by the European Commission (2021) confirmed how far the EU is from offering plant breeding the legal certainty that the sector needs. The report, prepared at the request of the Council of the Union, reflects that in the last twenty years the vast majority of new plant breeding techniques have been produced outside the EU. The report says that this is a consequence of the 'negative, dissuasive' impact on public and private investment of the regulatory framework that the EU has been applying to plant breeding for two decades (EC, 2021).

In light of the objectives that both the 'European Green Pact' (EC, 2019) and the 'From Farm to Fork Strategy' (EC, 2020) have placed, the relevance of seeking solutions seems evident, delving as a preliminary step into those circumstances for which the European Commission, following in the wake of other institutions such as the ECJ (2018) or the Federation of EU Scientific Academies (ALLEA, 2020), expresses so emphatically the need to review the regulatory framework currently applied to plant breeding. As will be detailed, the consensus on the need for such a review is high; but there are disagreements on what should be the sense and focus of such a reform (Task Force, 2021).

A combination of circumstances, together with the fact that plant breeding involves horizontal, vertical, and sectoral competences of complex distribution in multilevel governance, has led, as we shall see, to a critical situation from a socioeconomic point of view. As recognized by the Commission in its 2021

Section 11

study (2021), among the factors that have contributed to this scenario are the two main legal systems that apply to plant breeding: (1) the system regulating access to the market for new plant varieties, especially access for genetically modified varieties; (2) and the dual system of recognition for plant, in which traditional patents and UPOV system coexist. Both systems are in a critical situation, pending the definition of the EU guidelines to be followed regarding 'new plant breeding techniques' (NPBT). The EU food system is to define a large part of its future options. Competitors such as the USA, Argentina, and China, as well as Canada and Japan, have already taken positions.

More than two decades without consensus on GMOs

The main piece of the pre-market approval of GMOs, the gateway to market access for new plant varieties, is currently Directive 2001/18/EC, which regulates the deliberate release of genetically modified organisms (EP *et al.*, 2001). In this Directive, it was stated that access to the EU market was not necessary to authorize case by case for all new plant varieties, but only of those that fit into what – for the purposes of this Directive – are considered GMOs. We will detail in section 3 which GMOs are regulated in the Directive and which are not. At this point, it is appropriate to take a look at how little progress has been made with this Directive. As recognized by the EESC (2015) 'GMOs are a thorny issue and they provoke intense passions, both positive and negative'.

Conceived with the aim of overcoming the de facto moratorium that had been placed in the EU at the end of the 1990s, the Directive on GMOs (2001) was intended to ensure a pre-market approval with all the guarantees of environmental safety as well as legal certainty for plant breeders. The later objective, however, was not achieved. As the European Commission acknowledges in its study (2021), the regulatory framework has proved to be insecure and a disincentive to public and private investment. After two decades, the EU risks losing its historical hegemony in the development of new plant varieties.

In summary, only a few plant varieties have been approved for market access, practically all of them for non-agricultural use (with the exception of, for example, Bt maize), and there is no need for an EU premarket approval system for plant varieties that fall outside this classification. Directive 2001/18/EC only details the requirements for authorization of some GMOs -mainly transgenic ones- and the comitology model used to adopt decisions on those authorizations.

But in practice, since the entry into force of Regulation (EC) No 1829/2003, there has never been a qualified majority among Member States (MS) in the Council in favour of or against a draft Commission decision authorising GMOs and genetically modified food and feed. The outcome has been a permanent 'no opinion' at all administrative stages of the procedure. The Commission said (EC, 2015a) this situation constituted an 'exception to the normal functioning' of EU comitology. In view of this, a revision of the regulatory framework for GMOs was raised which, in its initial discussions, proposed to recognize to the MS: (1) an opt-out prerogative regarding, the agricultural use of GMO; (2) and another opt out prerogative regarding GM food and feed (Poli, 2017; Escajedo San-Epifanio, 2017). The proposal was discussed in different EU bodies, including the EP. In those debates, as will be explained below, the fatigue of a regulatory framework, impacted since the early 2000s by the lack of consensus, became evident.

Symptoms of GMO Regulatory Framework 'Burnout'

The first of the opt out prerogatives, the one affecting Directive 2001/18/EC, was approved. This was not, however, the case with the proposed opt out for the GM food and feed Regulation of 2003. This situation will plunge the regulatory framework for GMOs into an ever-deepening labyrinth to the point of even threatening a breakdown of the internal market (Escajedo San-Epifanio, 2017). Both opt out

proposals refer to plant varieties whose quality and food safety and environmental safety have been, without exception, endorsed by the European Food Safety Authority (EFSA). The agricultural use opt out was approved, since it only required action by national authorities. But the second was rejected, because it implied that in the future borders should be re-established to control trade in GM food and feed affected by Directive 2001/18/EC (EC, 2015b).

Following the recommendation of its ENVI-Committee, the EP approved the first of the proposals, giving rise to Directive 412/2015 (EP Legislative Observatory, 2015), and rejected by a very large majority – 619 votes against – the second of the proposals. Very little attention has been paid to the paradox of these votes, carried out by a Parliament composed of the same people. How is it possible that the concern about GMOs leads to restrict cultivation, but is not considered relevant enough to affect the marketing these products as food and feed ingredients? (Tagliabue, 2017; Escajedo San-Epifanio, 2017) Banning cultivation in the EU and allowing them to circulate means, in net terms, opening the doors wide to importers from third countries. Regarding the prerogative to exclude the use of authorized GMO varieties in national territory, in spring 2015 Directive 412/ 2015 was approved to reform Directive 2001/18/EC as regards the possibility for the MS to restrict or prohibit in their territory the cultivation of GMOs that have previously been authorized by the EU. This regulation came into force and allowed 19 MS – including the UK at the time – to make use of their opt out powers and express their wish to prohibit in all or part of their territory the agricultural use of GMOs (Romero, 2017; Eriksson *et al.*, 2021).

GMOs under Directive 2001/18/EC and the problem posed by the advent of NPBTs

EU public opinion does not seem to be very aware of the way in which the line separating GMOs ‘under’ and ‘out of’ the Directive 2001/18/EC was drawn, nor of the implications it currently has. In fact, it has even contributed to the spread of a pseudo-concept of GMOs, as many people think all GMOs are under the above-mentioned Directive (Tagliabue, 2017). Depending on the side of the line on which plant breeders are covered, they receive (inside or outside the Directive) a very different legal regime, in some cases with the need to apply for an authorization at European level and in other cases without the need for one. But this only refers to cultivation. As noted in the previous section, 19 MS (together with part of the United Kingdom) decided to restrict or prohibit the use of GMOs in their territory, but this only refers to agriculture.

Depending on the side of the line on which plant breeders are covered, they receive (inside or outside the Directive) a very different legal regime, in some cases with the need to apply for an authorization at European level and in other cases without the need for one. With respect to GM varieties requiring authorization, it is also possible that, once authorization has been obtained, all or some of the MS may decide to restrict them in their territory. But, as has been said, the opt out only refers to cultivation. Importation is not restricted (Tagliabue, 2017). It may be of interest to consult the document elaborated by the EPRS on the right of MS to opt out regarding imports of GM food and feed (EPRS – European Parliament, 2015).

As established by Directive 2001/18/EC, new plant varieties can legally fall into one of three groups: non-GMOs, ‘GMOs excluded from the Directive’ and ‘GMOs under the Directive’:

- a) Group 1 comprises those Plant Breeding Techniques that DO NOT result in the creation of genetically modified organisms. *In vitro* fertilization, conjugation or polyploid induction are techniques that alter the genome of plants but for the purposes of Directive 2001/18/EC the resulting plants are not considered to be GMOs.

b) Group 2 is that of plant breeding techniques that the Directive recognizes as giving rise to GMOs, but to which it is not considered appropriate to apply the Directive. Their exclusion means that their legal status is the same as that of non-GMOs. This is the case, for example, of mutagenesis by irradiation or using chemical agents. This is justified by the long history of safety in agriculture that is recognized for these techniques, suggesting – a *sensu contrario* – that it is the absence of such a history that leads to the establishment of a special regime for GMOs whose safety record is not so extensive. Today, food products obtained from these GMOs, of which there are many more than one might think, not only do not carry a specific label, but legally there is no objection to their being labelled as ‘GMO-free’. Many people who say they ‘do not consume GMOs in the EU’ are unaware of this. Legally, this is also of interest, Group 2 GMOs can be used without problems in organic farming, because it is interpreted that the ban on the use of GMOs in organic farming referred to in EU Regulation 2018/848 in Article 11, only excludes the use of Group 3 techniques.

c) Group 3: Techniques that GIVE RISE to GMOs and are under the Directive.

What is the current situation of NPBTs in the EU? According to the EU Commission (EC, 2021) the main techniques that can be understood to be covered under the term ‘new plant breeding techniques’ or new breeding techniques, are the following: (1) site-directed nucleases (SDN) (including ZFN-1/2/3 and CRISPR systems); (2) oligonucleotide-directed mutagenesis (ODM); (3) cisgenesis; (4) RNA-dependent DNA methylation (RdDM); (5) grafting (non-transgenic scion onto transgenic rootstock); (6) reverse breeding; (7) agroinfiltration. The Commission, without going into details, recognizes that applying to some of these techniques the framework established for the above-mentioned group 3 would be disproportionate, because the techniques result in substantially equivalent, and even more sustainable and optimized, products than group 2 techniques (European Commission, 2021). A notable case is that of targeted mutagenesis, which is a much more efficient and sustainable technique than, for example, radiation mutagenesis or chemical mutagenesis, the latter techniques resulting in GMOs excluded from Directive 2001/18/EC.

For a while the literature hosted doubts about whether or not some NPBTs could also be considered to give rise to GMOs excluded from the Directive (Escajedo San-Epifanio *et al.*, 2019). This was because, as noted above, Directive 2001/18/EC indicates that GMOs obtained by ‘mutagenesis’ are excluded from its regulatory framework, without specifying what kind of mutagenesis was meant. The case came before the ECJ, by way of a preliminary question: *Confédération paysanne and Others* (Case C-528/16).

At the time of the drafting of the Directive – i.e. early 2000 – physical and chemical mutagenesis existed, and an exemption was applied to them because repeated experience with their use led to the presumption that it was not necessary to extend to them the regime for GMOs that did fall under Directive 2001/18/EC. Induced mutagenesis, however, is a new technique, the risks of which still require research, and the ECJ considers that, in application of the precautionary principle, it would not be correct to equate this new technique with traditional mutagenesis.

Applying the precautionary principle, the ECJ ruling completely closed such a possibility of interpretation (ECJ, 2018). Although surprising to many plant breeding stakeholders, the ECJ simply reflects an act of self-restraint. The ECJ probably had somewhat more leeway to decide in light of the Treaties and the spirit of Directive 2001/18/EC, but thought that institutionally the expedient thing to do was to prevent a political problem, the GMO problem under the Directive, from becoming judicialized. Thus, the court returned to the Parliament, the Council, and the Commission the responsibility to define politically and legally the future of NPBTs.

Possible futures for the regulatory framework for plant breeding: holistic or compartmentalized?

Two decades ago, when Directive 2001/18/EC came into force, the EU was facing a multitude of challenges, including its expansion to 28 MS and the consolidation of the Treaties. Various socio-political and economic factors, many of them unrelated to plant breeding, conditioned the adoption of the Directive on GMO as well as the later systematic blockage that, as already mentioned, was repeatedly expressed in the decision-making under the Directive. It would be impossible to construct a common narrative of this past in order to build the future from it. The broadest consensus on plant breeding and its regulatory framework is paradoxically emerging now, not to propose a defined framework, but to criticize – from different perspectives – its obsolescence. Perhaps awareness of this need, i.e. the need for reform, is the starting point from which to begin work. It would be desirable that the actors involved and, in particular, the European legislators make determined efforts to achieve a regulation in the terms described by the ECJ; that is, a clear, evidence-based, applicable, proportionate and sufficiently flexible regulation to accommodate those plant breeding proposals that can contribute to achieve the objectives of the Green Deal and the Farm to Fork Strategy.

The possibilities are diverse. It is possible, for example, to introduce minor interpretative adjustments that would contribute to a more proportionate application of Directive 2001/18/EC to at least some of the NPBTs. For example, there are many voices advocating the exclusion from the Directive of those NTBPs that, without genetic exchange, lead to modifications of the genetic material in a sense comparable to those occurring spontaneously in nature or those obtained by traditional methods – i.e. crossing between related varieties and wild species or random mutagenesis – (e.g. Purnhagen, 2020). In the short term, this may be one of the most feasible ways forward, at least for some NPBTs (ALLEA, 2020). In the medium to long term, however, it would be desirable for the EU to find a way to revise Directive 2001/18/EC in a more comprehensive way; a way in which, while maintaining standards of food and environmental quality and safety, more legal certainty is provided to EU plant breeders and those who benefit from their work.

Acknowledgements

VegEquity Project, *Plant Breeding and European Integration*, presented to the Project Grant Call of MÍCINN, 2021, P. R. L. Escajedo; *Food Equity Project*, funded by the UPV/EHU, US 21/22; Cost Action 18111, *Genome Editing in Plants*, PR D. Eriksson.

References

- ALLEA. (2020). Genome Editing for Crop Improvement. *Allea Symposium Report*. ANOVE. (2021). Dossier de Prensa. Spanish Association of Plant Breeders.
- ECJ. (2018). European Court of Justice Ruling C-528/16, Confédération paysanne and Others. ECLI identifier: ECLI:EU:C:2018:583.
- EESC. (2015). Proposal for a Regulation of the European Parliament and of the Council amending Regulation (EC) No 1829/2003 as regards the possibility for Member States to restrict or prohibit the use of genetically modified food and feed on their territory (rolling p. EESC-2015-02913-00-01-AC-TRA (EN).
- EP Legislative Observatory. (2015). Procedure file of Regulation on Possibility for the Member States to restrict or prohibit the use of genetically modified food and feed on their territory.. European Parliament, 2015/0093(COD).
- EPRS – European Parliament. (2015). Briefing, EU Legislation in Progress.
- Eriksson D, de Andrade E, Bohanec B, Chatzopoulou S, Defez R, Eriksson NL, van der Meer P, van der Meulen B, Ritala A, Sági L, Schiemann J, Twardowski T, Vaněk T. (2021). Why the European Union needs a national GMO opt-in mechanism. *Nature Biotechnology* 36 (1), 115.

Section 11

- Eriksson, D.; Custers, R.; Edvarsson Bjönberg, K.; *et al.* (2020). Options to Reform the European Union Legislation on GMOs: Scope and Definitions. *Trends in Biotechnology*, vol. 38 (3): 231-134.
- Escajedo San-Epifanio L., Eriksson D., *et al.* (2019). GMO Opt-Out in the EU. In: Kaplan D.M. (eds) *Encyclopaedia of Food and Agricultural Ethics*. Springer, Dordrecht.
- Escajedo San-Epifanio, L. (2017). Towards a new regulatory framework for GMOs in the EU: will it be third time lucky? In: Escajedo San-Epifanio, L. (ed). *Towards a New Regulatory Framework for GM Crops in the U. Scientific, Ethical, Social and Legal Issues and the Challenges Ahead*. Wageningen Academics Publisher.
- European Commission. (2015a). Communication from the Commission. Reviewing the decision-making process on genetically modified organisms (GMOs), COM (2015) 176 of 22 Apr.
- European Commission. (2015b). Proposal for a Regulation allowing Member States to restrict or prohibit the use of GMOs for food or feed purposes in their territory. COM(2015)0177.
- European Commission. (2019). The European Green Deal. COM/2019/640 final.
- European Commission. (2020). Communication A Farm to Fork Strategy for a fair, healthy and environmentally-friendly food system. COM/2020/381 final.
- European Commission. (29 de April de 2021). EC study on new genomic techniques.
- European Parliament. (2014). European Parliament resolution of 25 February 2014 on plant breeding: what options to increase quality and yields? (2013/2099). OJ C 285: 47-51.
- European Parliament and European Council. (2001). Directive 2001/18/EC on the deliberate release into the environment of genetically modified organisms. Official Journal L 106: 1-39.
- Poli, S. (2017). The Reform of the EU Legislation on GMOs: A Journey to an Unknown Destination? *European Journal of Risk Regulation*. Vol. 6 (5), pp. 559-572.
- Purnhagen, K.P. (2019). How to Manage the Union's Diversity: The Case on the Regulation of New Plant Breeding Technologies Confédération Paysanne and Others. *Wageningen Working Papers in Law and Governance* 03/2019.
- Purnhagen, K.; Wesseler, J. (2020). EU Regulation of New Plant Breeding Technologies and Their Possible Economic Implications for the EU and Beyond. *Applied Economic Perspectives and Policy*.
- Romero Caro, F.J. (2017). Restrictions on GM crops in the European Union: between legislative unity and the diversity of national positions. In: Escajedo San-Epifanio, L. (ed). *Towards a new regulatory framework for GM crops in the European Union. Scientific, ethical, social and legal issues and the challenges ahead*, pp. 61-75. Wageningen Academics Publisher.
- Tagliabue, G. (2017). The EU legislation on 'GMOs' between nonsense and protectionism: An ongoing Schumpeterian chain of public choices. *GM Crops Food* 1017, 8(1): 57-73. doi: 10.1080/21645698.2016.1270488.
- Task Force on Sustainable Agriculture and Innovation. (2021). White Paper on the Regulation of Genome Editing in Agriculture. Task Force established by Re-Imagine Europa (RIE).

80. How smart should resilience be? On the need of a transdisciplinary approach to transform pig production systems

M.F. Giersberg^{1*}, J.E. Bolhuis², T.B. Rodenburg^{1,2} and F.L.B. Meijboom^{1,2}

¹*Animals in Science and Society, Department Population Health Sciences, Faculty of Veterinary Medicine, Utrecht University, Yalelaan 2, 3584 CM Utrecht, the Netherlands;* ²*Adaptation Physiology Group, Department of Animal Sciences, Wageningen University & Research, De Elst 1, 6708 WD Wageningen, the Netherlands; m.f.giersberg@uu.nl*

Abstract

Pig production is related to many societal challenges. This raises the question whether and how pig production systems can be transformed in a way that better includes animal welfare and is responsive to (other) societal concerns. In a project funded by the Netherlands Organisation for Scientific Research (NWO), we focus on the role of resilience to explore the possibilities of defining novel production systems that better match with the interests and adaptive capacities of animals. However, to play this central role, the concept of resilience needs an integrated and transdisciplinary approach. Using the ‘SmartResilience’ project as an example, we argue that to address societal challenges in livestock production it is not sufficient to view one topic through the lenses of multiple disciplines and to produce research results from each discipline which are only supplementary to one another. We argue why complex societal challenges like transforming livestock systems can only be tackled by real collaboration between different disciplines, and why this collaboration already needs to start in the design-phase of innovations. We discuss three stages of collaboration that will lead to a deepened integration of disciplines, which will ultimately result in positive societal impact: (1) identifying the underlying concepts that play a role for achieving the project aim (e.g. animal welfare, resilience); (2) making the implicit assumptions of these concepts explicit by integrating knowledge and methods from different disciplines (e.g. philosophy and animal science); and (3) translating and incorporating the explicit assumptions of concepts into practice and into further actions within the project (e.g. pig breeding or housing strategies). By doing this, we expect to prepare a route forward for more welfare-friendly and sustainable pig production that is in dialogue with society.

Keywords: livestock systems, interdisciplinarity, societal challenge, collaboration

Introduction

Current pig production in Europe, which mainly takes place in intensive indoor systems, is subject to public criticism. Societal concerns are related to animal welfare, public health risks and environmental sustainability (Giersberg and Meijboom, 2021). This raises the question whether and how pig production systems can be transformed to be responsive to these diverse concerns. In the ‘SmartResilience’- project, funded by the Netherlands Organisation for Scientific Research (NWO), a team consisting of researchers from various academic disciplines and industry partners is focusing on the role of resilience for these transformative processes. The overall aim is to develop a novel, sustainable pig production system that enhances animal resilience and welfare, and addresses societal concerns.

Joint projects, such as ‘SmartResilience’, are already the norm in many research initiatives related to topics of agriculture and food supply. In many cases, researchers find their own niches within a multidisciplinary project team and work more or less independently on the shared topic and the common research aims.

Section 11

However, for addressing complex societal challenges and changing established systems, it is not sufficient to view one topic through the lenses of multiple disciplines and to produce research results which are supplementary to one another. What is needed is a transdisciplinary approach to the key concepts of the project. By this, the project team can move beyond discipline-specific perspectives to create outcomes that are both scientifically sound and problem-solving oriented.

Using the ‘SmartResilience’-project as an example, we argue why complex societal challenges like transforming livestock systems can only be tackled by being serious about collaboration among academic disciplines and relevant stakeholders. In this paper we discuss three stages of collaboration that will enable to reflect on the theoretical assumptions related to the challenge and to create practical solutions, which will ultimately result in positive societal impact. First, we address the identification of the underlying concepts that play a role for achieving the project aim. Second, we elaborate on how the integration of knowledge and methods from different disciplines can help to make the implicit assumptions of the identified key concepts explicit. Finally, we discuss the role of collaboration for translating and incorporating the explicit assumptions of concepts into practice and into further actions within the project. With this approach, we expect to facilitate the aim of the ‘SmartResilience’-project and provide a framework for collaboration and deepened integration for similar societal challenge-oriented research projects.

Identifying the underlying concepts

During the first stage of collaboration, the concepts that are key for achieving the project aims have to be identified. This task may seem quite straightforward, as the consortium has typically built the study design on these very concepts. However, although the outlines of the concepts will be clear to all collaborators, determining their underlying meaning may be difficult. First, particularly in more applied agricultural and food sciences, complex concepts that concern societal challenges, such as ‘sustainability’, are often directly indicated in the calls of research funding bodies. Proposals may then be constructed to fit the subject of ‘sustainability’, without prior deeper analysis of the concept by the group of applicants. If there is no experienced need to discuss this beforehand, it can be challenging to agree on the interpretation of this concept afterwards. Second, the meaning of scientific concepts may contain ambiguities, inconsistencies and variation. Kampourakis (2018) argues that this is due to the following issues: the meaning of a term may differ depending on whether it is used in everyday language or to describe a scientific concept; scientific concepts are often presented as metaphors to explain something which is not understood completely; and the same scientific concept may have different connotations for scientist of different (sub-)disciplines. Population geneticists for instance may refer to the concept of genes as factors related to phenotypic traits, whereas molecular biologists may view genes as DNA segments coding for a specific protein. Finally, the same concept may be construed as scientific concept or as a normative concept (for the almost universal applicability of this see e.g. Natalia and Heinrichs (2020) on the concept of polycentricism).

In the following we focus on two key concepts of the ‘SmartResilience’- project: resilience and animal welfare. The concept of resilience is exemplary for the potential pitfalls mentioned above: the term is used in different ways in diverse scientific disciplines, by policy makers and the wider public (Baggio *et al.*, 2015). However, although shared understandings of resilience occur, the bridging nature of this concept across disciplines seems to be limited (Baggio *et al.*, 2015). What seems to be common ground is that resilience is always associated with the capacity of a system to bounce back to normal functioning after a perturbation (Scheffer *et al.*, 2018), which is a metaphor. The same applies to the related concept of tipping point, which describes abrupt transitions in dynamic systems, often caused by minor initial changes, to a new, usually less stable and less functional state (Van Nes *et al.*, 2016). Whether resilience is an exclusively descriptive, normative or a combination of both, i.e. a hybrid concept has been discussed

controversially (e.g. Brand and Jax, 2007; Thorén and Olsson, 2018). It seems that at least the practical application of the concept of resilience will involve normative assumptions about the system it is applied to (Thorén and Olsson, 2018). The nature of conceptions of animal welfare is similarly diverse as the one of resilience (Weary and Robbins, 2019). Common interpretations include the three-circle framework of biological functioning, affective states and natural living (Fraser *et al.*, 1997) and the dynamic approach of focusing on positive welfare and the adaptive capacities of animals (Ohl and Van der Staay, 2012). In a probably less controversial way than resilience, animal welfare can be framed both as an empirically accessible scientific concept and as a moral concept, including hybrid approaches (Stafleu *et al.*, 1996).

Identifying the key concepts of the project and their varying meanings is only possible through dialogue of the multidisciplinary project team. Within one discipline, often only one interpretation of a certain concept prevails. The biologist will build a different account of resilience than the philosopher. As transforming the pig production sector is a societal challenge, the ‘SmartResilience’- project cannot restrict this to an internal debate or opt for one disciplinary interpretation. In society, all possible interpretations of resilience will be found. As a consequence this diversity has to be included in the project. If the project results and solutions are built on one account of resilience only, without the researchers being aware of it, these outcomes will likely fail in practice. Acknowledging that key concepts of a project are not mere black and white, but that their meanings may be varying or ambiguous, forms the basis for the next step of collaboration: making the assumptions linked to the respective interpretation of a concept explicit.

Making implicit assumptions of concepts explicit

Once the relevant concepts have been identified, it is important that researchers make the assumptions explicit that *they* implicate in *their* use of these concepts in order to reach the project aims. This can best be achieved by integrating the knowledge and methods from the multidisciplinary project team.

In the case of the ‘SmartResilience’-project, the for the animal scientists implicit assumptions related to the concepts of resilience and animal welfare were examined through conceptual analysis. In line with the transdisciplinary research paradigm, this analysis was applied to a conversation. During this conversation of the project team, the animal scientists were presented with counterexamples to their seemingly self-evident and unquestioned accounts of resilience and animal welfare. The fact for instance that enhancing resilience was always associated with having a positive value was challenged by the view that enhancing resilience in pigs could be a mere means to alleviate detrimental production environments, and that under ideal conditions, high resilience would not be needed. This led to the question for whom it would be positive to improve resilience: would it only be in the interest of the persons keeping the pigs, or could it be in the interest of the pigs as well? Here, the knowledge of the animal scientists is needed to determine which conditions and procedures pose challenges to the pigs, and to assess where undesirable effects of a challenge should be tackled by removing the challenge, and where resilience should be improved because removing the challenge is not possible or even undesirable. An example is the often stressful weaning of piglets, which usually takes place at a very early age for reasons of production efficiency. Instead of making piglets more resilient to early weaning, the procedure itself could be adapted, for instance by weaning piglets at a later age or more gradually. Other challenges, such as the risk of infections, may be inevitable, even under ideal housing and management conditions. The ability to cope with such challenges would be in the interest of the keeper, but also in that of the pig, who may experience its state as more positive when having the capacity of (fast) recovery. There may be even challenges that are desirable for the pig: there is evidence that providing animals with problem solving opportunities and challenging their cognitive abilities can lead to rewarding experiences, provided the animals possess the skill and the resources to solve the task (Meehan and Mench, 2007). These examples show what became explicit during the conversation: the interrelation of the concepts of resilience and

Section 11

animal welfare. How we frame animal welfare, for instance as the possibility to experience positive affective states, shapes our assumptions regarding resilience and vice versa.

For the transition to the next step of collaboration, the translation to and application of concepts in practice, further knowledge and methods of animal science are needed. To monitor and predict loss or improvement of resilience, biological processes that serve as indicators for the previously identified assumptions of the concepts have to be quantified. In the 'SmartResilience'- project, this is done by a combination of traditional physiological methods, such as the analysis of blood parameters, and sensor technologies, such as accelerometers (Van der Zande *et al.*, 2020) or computer vision (Van der Zande *et al.*, submitted). As mentioned above, societal challenges can only be tackled successfully if perspectives of society are included early on. However, the methods of philosophy and animal science are not sufficient to achieve this. It is also not a stand-alone task for social scientists, as they need to incorporate the identified concepts and their implication in the design of the indented stakeholder engagement activities. In turn, results from interviews, focus groups or other activities have to be fed back to the whole project team to enable it to take societal perspectives into account during subsequent phases of the project. In addition, the 'SmartResilience'- project involves animal scientists from the industry as relevant stakeholders in the project team and in the discussions outlined above. On the one hand, this enables the stakeholders to integrate these early project results in their long-term strategies. On the other hand, due to their unique insight into the current practice, they can indicate where the largest efforts regarding a transformation of the system have to be taken.

Translating and integrating concepts into practice

During a third phase, collaborative efforts should be directed at the implementation of the now explicit assumptions of concepts into practice and into further action within the project. The ultimate aim should be to produce functional results which do not only enhance our understanding of concepts and related phenomena, but which have the potential to create positive societal impact by transforming current systems.

As outlined above, the intention of the 'SmartResilience'- project is to improve the resilience of pigs in order to better meet their interests and not to tolerate the shortcomings of the current production system. One option to enhance the resilience of pigs in practice is to provide them with an enriched environment that offers various opportunities to perform species specific behaviours. In order to be coherent in the assumption that resilience should be improved for the pigs' own interests, the pigs need to have the physical and cognitive capacities to interact with such an environment. If this is not the case, enriched environments can lead to the opposite of what has been intended: the animals are overburdened and frustrated by these environments. A practical approach may be to implement breeding programs in which pigs are selected for their ability to thrive in complex, rewarding environments. It should be noted that a consequent translation of the animal-interest perspective of resilience into practice is likely to come at a cost of other interests. Both providing complex, enriched housing environments and breeding for enhanced capacities to interact with these environments may be at odds with the high economic efficiency of barren systems and high yielding hybrids. If the project results would suggest that the only way to keep resilient pigs would be to keep them outside, this would not be environmentally sustainable without transforming other parts of the system, for instance radically reducing the number of pigs kept. This, in turn would raise questions of food justice.

Therefore, it is important as a project team to keep reflecting on the relevant concepts and to relate their assumptions to the broader perspective of the project. Which implications do the resilient pigs in their resilient micro-environment have for the pig production sector, for the livestock system, and for the food system as a whole? Are we creating resilient pigs (in line with our assumptions of the concept) in

an overall un-resilient system (when our assumptions are applied to the broader system)? By doing so, it will be possible to adjust the scientific direction and further action within the project where necessary. It is obvious that these considerations need to be balanced and that certain assumptions have to be taken for granted to not get stuck. Constant fundamental discussion (e.g. should humans keep pigs at all?) would hamper progress and functional outcomes of this specific project (i.e. research on resilience in pigs). In the course of the project, reflecting on the underlying assumptions of concepts will narrow down, whereas the practical part will gain significance. However, an interaction of practical efforts and conceptual reflection remains necessary throughout all phases of collaboration in a transdisciplinary research project.

Conclusions

In this paper we show that in a transdisciplinary research project an integration of theoretical assumptions and practical efforts through real collaboration can be a way forward to tackle complex societal challenges. It is important to note that the three stages of collaboration presented are not meant to describe a chronological guide to successful collaboration. In practice, the phases will overlap, for instance the identification of underlying concepts will not be possible without considering the related assumptions that need to be made explicit. In fact, theoretical consideration and practical action can be viewed on a continuum throughout the course of the project, where, depending on the project phase, the focus lies on the one or the other aspect. Furthermore, consensus on the assumptions of concepts within the project team should not be overrated. Collaboration aims at conceptual understanding and not necessarily at agreement. To create socially functional outcomes, it is more important to be aware of and to acknowledge the plurality of views on the issue. For the 'SmartResilience' - project, these insights mean a route forward for a more welfare-friendly and sustainable pig production that is in dialogue with society. We encourage consortia working on similar challenge-orientated research projects to adapt, modify and add to this proposed framework of collaboration.

References

- Baggio, J.A., Brown, K., Hellebrandt, D., 2015. Boundary object or bridging concept? A citation network analysis of resilience. *Ecol. Soc.* 20. <https://doi.org/10.5751/ES-07484-200202>
- Brand, F.S., Jax, K., 2007. Focusing the meaning(s) of resilience: Resilience as a descriptive concept and a boundary object. *Ecol. Soc.* 12. <https://doi.org/10.5751/ES-02029-120123>
- Fraser, D., Weary, D.M., Pajor, E.A., Milligan, B.N., 1997. A scientific conception of animal welfare that reflects ethical concerns. *Anim. Welf.* 6, 187-205.
- Giersberg, M.F., Meijboom, F.L.B., 2021. Smart Technologies Lead to Smart Answers? On the Claim of Smart Sensing Technologies to Tackle Animal Related Societal Concerns in Europe Over Current Pig Husbandry Systems. *Front. Vet. Sci.* 7, 1-6. <https://doi.org/10.3389/fvets.2020.588214>
- Kampourakis, K., 2018. On the Meaning of Concepts in Science Education. *Sci. Educ.* 27, 591-592. <https://doi.org/10.1007/s11191-018-0004-x>
- Meehan, C.L., Mench, J.A., 2007. The challenge of challenge: Can problem solving opportunities enhance animal welfare? *Appl. Anim. Behav. Sci.* 102, 246-261. <https://doi.org/10.1016/j.applanim.2006.05.031>
- Natalia, V.V., Heinrichs, D., 2020. Identifying polycentricism: a review of concepts and research challenges. *Eur. Plan. Stud.* 28, 713-731. <https://doi.org/10.1080/09654313.2019.1662773>
- Ohl, F., Van der Staay, F.J., 2012. Animal welfare: At the interface between science and society. *Vet. J.* 192, 13-19. <https://doi.org/10.1016/j.tvjl.2011.05.019>
- Scheffer, M., Bolhuis, J.E., Borsboom, D., Buchman, T.G., Gijzel, S.M.W., Goulson, D., Kammenga, J.E., Kemp, B., Van de Leemput, I.A., Levin, S., Martin, C.M., Melis, R.J.F., Van Nes, E.H., Michael Romero, L., Olde Rikkert, M.G.M., 2018. Quantifying resilience of humans and other animals. *Proc. Natl. Acad. Sci. U. S. A.* 115, 11883-11890. <https://doi.org/10.1073/pnas.1810630115>

Section 11

- Staffeu, F.R., Grommers, F.J., Vorstenbosch, J., 1996. Animal welfare: Evolution and erosion of a moral concept. *Anim. Welf.* 5, 225-234.
- Thorén, H., Olsson, L., 2018. Is resilience a normative concept? *Resilience* 6, 112-128. <https://doi.org/10.1080/21693293.2017.1406842>
- Van der Zande, L.E., Dunkelberger, J.R., Rodenburg, T.B., Bolhuis, J.E., Mathur, P.K., Cairns, W.J., Keyes, M.C., Eggert, J.M., Little, E.A., Dee, S.A., Knol, E.F., 2020. Quantifying Individual Response to PRRSV Using Dynamic Indicators of Resilience Based on Activity. *Front. Vet. Sci.* 7, 1-7. <https://doi.org/10.3389/fvets.2020.00325>
- Van Nes, E.H., Arani, B.M.S., Staal, A., Van der Bolt, B., Flores, B.M., Bathiany, S., Scheffer, M., 2016. What Do You Mean, 'Tipping Point'? *Trends Ecol. Evol.* 31, 902-904. <https://doi.org/10.1016/j.tree.2016.09.011>
- Weary, D.M., Robbins, J.A., 2019. Understanding the multiple conceptions of animal welfare. *Anim. Welf.* 28, 33-40. <https://doi.org/10.7120/09627286.28.1.033>

81. The literary classroom conversation as a didactic method for teaching food ethics

S. Meisch^{1,2*} and S. Hofer-Krucker Valderrama^{3,4}

¹International Centre for Ethics in the Sciences and Humanities, University of Tübingen, Wilhelmstr. 19, 72074 Tübingen, Germany; ²Centre for the Study of the Sciences and the Humanities, University of Bergen, Parkveien 9, 5020 Bergen, Norway; ³Kantonsschule Enge, Steinentschstrasse 10, 8002 Zürich, Switzerland; ⁴Universität Zürich, Kantonsschulstrasse 3, 8001 Zürich, Switzerland; simon.meisch@uni-tuebingen.de

Abstract

How can literary texts be used in teaching food ethics? How can food ethical topics be addressed in literature classes? As an answer to both questions, our paper introduces the Heidelberg Model of Literary Classroom Conversations (LCC). As a didactic method, it focuses on bringing together learners' lifeworld experiences with the close reading of a text. We describe how we use in LLCs a poem by the German author Silke Scheuermann (*1973) that addresses the fate of the passenger pigeons. More specifically, her poem speaks about the historic passenger pigeon Martha, who has evolved into an icon of species extinction. We discuss how the poem raises food ethical issues, present contributions from learners made after an LCC and show how the learners reflect on food and animal ethical issues. Finally, we discuss the potentials of LCCs for food ethics and literary classes alike. Our paper aims to introduce the food ethics community to a didactical method that has been used primarily in German-language literary didactics, but that has added value to ethics teaching beyond its initial context.

Keywords: ethics teaching, didactics, literary classroom conversations, narrative ethics

Introduction

In this paper, we introduce the didactical method of *Literary Classroom Conversations (LCC)* as a way to engage with literary texts in interdisciplinary ethics teaching, such as food ethics. Often, such texts address ethical issues, and as it were, invite readers to contemplate these topics (cf. von Matt, 1995, 36-39). For teaching contexts, this has several ramifications, two of which we will discuss more in detail. First, ethics lecturers can use a literary text as teaching material, e.g. because it expresses an ethical concern in more condensed and easily accessible ways and can thus start a discussion. Second, focussing on ethical issues raised in a text allows literature teachers to discuss (beyond formal aesthetic aspects) lifeworld issues that are (or according to the curriculum, should be) of interest to their students. Both these regards are probably already standard practice for many lecturers in ethics or literature. So, they might have experienced that course participants' responses did not match their expectations of how a literary text would function in a teaching context. One of the reasons might be that in this context, not everybody feels confident enough to speak freely about a literary text, say a poem. In interdisciplinary contexts, such as food ethics, where people of different disciplinary backgrounds often meet, this might be even more so. For some students, discussing poetry is simply not part of their academic lives. The LCC, in turn, is a didactical method precisely meant to support learners' *literary-aesthetic communication competence* (cf. Hofer-Krucker Valderrama and Weber, 2020, 137). The concept was developed by German literary didactics scholars affiliated with the Heidelberg University of Education (cf. Steinbrenner and Wiprächtiger-Geppert, 2010).

In this paper, we argue that beyond its original context but still in line with it, and based on our teaching experiences, the LCC is a useful tool for discussing literary texts in interdisciplinary ethics courses such

Section 11

as food ethics. Thus far, we have tried it in various contexts, i.e. school classes, university courses, and teacher trainings, both in Zürich and Tübingen. Below, we draw on our observations made in a German literature class held at a Zürich grammar school, and in interdisciplinary ethics courses held at the University of Tübingen. We start our argument by introducing the LCC, before presenting how it was employed in the Zürich school class. Pupils back then engaged with the poem *Dem ehemals häufigsten Vogel der Welt* ('To the once most frequent bird in the world')¹⁹ by the German poet Silke Scheuermann (*1973), and the ethical issues it raises (cf. Meisch and Hofer-Krucker Valderrama, 2022). Finally, we discuss how the LCC can be useful in food ethical teaching formats.

Literary classroom conversation

The method

As a method, the LCC aims to support learners' 'literary-aesthetic communication competence'. It focuses on aligning learners' lifeworld experiences, associations, and individual reactions with a close reading of a text. With this, it aims to support subjective involvement and careful perception alike. In addition, it familiarises learners with the insight that processes of meaning-construction are open and multi-perspective. As such, they also experience the dialogical nature of understanding. Beyond that, LCCs involve learners more directly in discussions. As such, it contrasts with ways of teaching where most inputs come from the lecturer, only a few learners participate, and the focus stays on subject-specific topics (e.g. history of literature, literary techniques, or author biography). This makes the LCC more than just a technique. For, it also requires a special (i.e. appreciative) attitude of the lecturer to the learners and the conversation. Otherwise, the LCC risks becoming an empty shell (cf. Steinbrenner and Wiprächtinger-Geppert, 2010; Hofer-Krucker Valderrama and Weber, 2020; Spinner, 2006).

The LCC follows a clear structure (Table 1). The conversation works well with 5-6 participants. So, a lecturer may decide to divide the group and form an inner and an outer circle. The participants of the former discuss the text. As the outer circle is necessarily less active, the lecturer needs to decide on suitable methods to involve it as well (e.g. via an open chair or the online tool Padlet).

LCCs in ethics teaching

Before exploring teaching contexts, let's ask first for the place of LCCs in ethics classes. In conceptual terms, the method is meant to start conversations on a text based in learners' concrete reading experiences, which are often related to lifeworld experiences (cf. also Hobson-West and Miller, 2021). As such, an LCC can be an entry point to ethical issues students grapple with, and hence, be used as a method of narrative ethics that 'is not descriptive ethics because it is a component of the value-oriented debate about the good life, and it is not prescriptive ethics [...] because it does not itself become a discourse of justification.' Still, 'it does provide the hermeneutic framework for the normative question of the moral ought, to the extent that this is related to historical situations and transcends the formal discourse of justification' (Haker, 2010, 3, own translation). So, from a didactic perspective, the LCC has the potential to realise these claims of narrative ethics, i.e. to contribute to the 'value-oriented debate about the good life' and to the understanding of the 'hermeneutic framework for the normative question of the moral ought'. Yet, just like narrative ethics, LCCs cannot 'become a discourse of justification', and they do not aspire to do so (cf. Meisch, 2019). If the justification of ethical statements is a matter of concern, lecturers will need to draw on other methods (cf. Fehling, 2009). Below, we will explore different ways in which LCCs might be a valuable tool for engaging with food and animal ethical topics.

¹⁹ The text of the poem together with an English and Danish translation can be found online on the webpage of the *Haus für Poesie* (Berlin): <https://www.lyrikline.org/de/gedichte/dem-ehemals-haeufigsten-vogel-der-welt-729>.

Table 1. Structure of an LCC (from the perspective of the lecturer) (Translated and modified, Steinbrenner and Wiprächtiger-Geppert, 2010, 11).

-
1. Introduction:
 - Create pleasant conversational atmosphere, e.g. by forming a circle of chairs
 - Explain the context and structure of the following conversation
 2. First text encounter:
 - Create a first (and acoustic) encounter with the text by reading it out once or multiple times
 3. First round:
 - Invite everybody (learners and lecturer) to express their first impression of the text by commenting on a specific passage they personally find remarkable
 4. Open conversation:
 - Invite everybody (learners and lecturer) to share further thoughts on the text
 - Allow time for reflection
 - If necessary, provide inputs or help to guide the discussion
 - If there are people in an outer circle, find ways to introduce their thoughts to the discussion
 5. Closing round:
 - Give everybody (learners and lecturer) the opportunity to share where they currently stand with the text
 6. Windup:
 - End conversation without haste
 - Make closing remark
-

An example: Silke Scheuermann's 'Dem ehemals häufigsten Vogel der Welt'

Using the example of Scheuermann's poem, we elaborate on how an LCC ideally supports ethical learning processes. The text is well-suited for this method, as it invites readers to form their own ethical judgements. Specifically, it deals with the fate of the passenger pigeons, which were considered the 'most frequent birds in the world' in the early 19th century but were nevertheless extinct by the end of the same century. The poem touches on different food and animal ethical aspects. We conclude this section by describing how pupils of a Zürich grammar school class addressed these aspects.

Context: Martha and the extinction of the passenger pigeons

Silke Scheuermann's poem speaks about the historic passenger pigeon Martha who died in the Cincinnati Zoo on 1st September 1914 at around 1 pm. Her death marks the time and place of the extinction of an entire species. Martha soon became 'one of the great icons of extinction' (Fuller, 2014, 9). Since then, the phenomenon of the passenger pigeon is accompanied by a sense of astonishment and bewilderment. This is vividly expressed by the artist Errol Fuller:

'The story of the Passenger Pigeon reads like a work of fiction. At the start of the nineteenth century these birds existed in unimaginable numbers – billions upon billions. The species may have made up as much as 40% of the bird population of North America. It may even have been the most numerous bird species on the planet. The flocks were so large and so dense they blackened skies, blotted out the sun. But by the century's end it was over; the birds were gone from the wild. North America's commonest bird had simply vanished. By the year 1914 just a single individual (out of all the countless millions) was left. She was called Martha and she lived alone in a cage at the Cincinnati Zoo. In September this last representative of her species died, and as a living entity the Passenger Pigeon was no more.' (*ibid.*)

Section 11

How could a bird that was synonymous with abundance go extinct within less than a century? There are many reasons for the extinction of the passenger pigeon, and they all have to do with the arrival of European immigrants to North America (cf. Schorger, 1955; Avery, 2014). First, they cut down the woods in North-Eastern America, and thus destroyed the pigeons' habitats. Second, as the meat and feathers of these birds were popular in the rapidly growing US-American cities, they were excessively hunted. In addition, new technologies professionalised hunting. For instance, telegraphy allowed to inform hunters of a flock sighting, while railways enabled them to reach the spot quickly. In hunting seasons, trains and boats were hired to transport the prey to the growing urban centres. Even though both Native Americans and nature conservationists warned of the bird's decline, their voices went unheard until it was too late.

For many authors, Martha's story is but one example of narratives about the environmental destruction caused by European settlers in the Midwest (cf. Avery, 2014). These narratives organise human-nature relations around a moral centre, as was elaborated by the environmental historian William Cronon (1992). He also showed that the depiction of the landscape at the beginning and end of such a narrative plays a constitutive role, i.e. whether the narrative describes the transformation of a wilderness into a Garden of Eden through human ingenuity or rather the transformation of an intact ecosystem into a desert through greed and ignorance. The latter narrative refers to the destructions brought by European immigrants and their capitalist economy during the westward expansion, and of which the extinction of the passenger pigeon is part and parcel.

Martha in Scheuermann's poem

The poem is a short text of 132 words and 24 lines. It is written in free verse (i.e. no meter pattern or rhymes). In the poem, a lyrical subject addresses Martha and contemplates how it must feel '[to] be the last one of a kind'. While at first sight the poem appears to be a simple read, it reveals a disturbing moral ambivalence at further glance. On the one hand, it clearly evokes the environmental narrative on the techno-scientific destruction of the American nature by European settlers and how their longing for cheap meat led to the pigeons' extinction. On the other hand, the poem refrains from providing the moral centre that these narratives have. The only two evaluative markers are, first, the rather vague adjective 'strange' when the lyrical subject contemplates Martha's feelings ("To be the last one of a kind / what a strange task") and second, the exclamation 'what a dilemma that you were so tasty' that leaves readers wondering about the nature of this dilemma. Yet, there are other ambivalences. The lyrical subject's empathising with Martha, and its attributing to her the abilities to communicate and remember acknowledge a perspective according to which humans as beings capable of suffering can develop an idea of other animals' suffering (cf. de Waal, 1999). In turn, human-animal scholars see this humanisation of an animal altogether more critical (cf. Borgards, 2016). So, while the poem invokes aspects of narratives of destruction, it leaves the moral centre characteristic of these narratives undetermined, and hence invites readers to form their own judgement. It is precisely this indeterminacy, resulting from a mismatch between a seemingly clear moral stance and a withdrawn ethical evaluation, that makes the poem ideal for an LCC in ethics classes.

Reflections from learners

Below, we describe the ethical reflection processes of pupils in a German literature class.²⁰ After the LCC, they were asked to write down their impressions – with the intention in mind to couple oral exchange with written reflection and to get inputs for the following unit. Our analysis here focusses on the question of how the encounter with the poem supported the pupils' engagement with food and animal ethical issues.

²⁰ The class was held at the Kantonsschule Engen (Zürich) in summer 2021. Its pupils were roughly 16 years old. For this paper, we translated their responses.

Many pupils dealt with Martha's 'strange task'. Zion, for instance, emphasises that her task is to 'represent the whole species of birds'. Elliot, meanwhile, broadens the perspective by stating: 'This poem showed me very strongly how well poetry can make us human beings think. I was greatly struck by how timely the questions are that Silke Scheuermann directs us to.' It is less surprising that many pupils mentioned the ongoing species extinction. Tair turns to two further topics laid out in the poem: meat consumption and population growth: 'This poem makes me think about our eating behaviour. We humans consume an unnatural amount of meat. In doing so, we mess up nature. By this I mean not only factory farming & over-fishing, but also that we humans have no enemy [...] The world's population has more than doubled in the last 80 years and will most likely continue to rise'. Elliot also takes a sceptical stance: 'And while we struggle with our problems, our environment suffers from every minute of indecision, and meanwhile the once most frequent bird in the world becomes the lonely passenger pigeon Martha, who now has the symbolical philosophical task of bringing a species to a worthy end'. With reference to the challenges mentioned above, two pupils emphasise the relevance of literature. Elinor, referring to her experience as participant in the LCC's inner circle, states: 'Only after some exchange I realised that the poem is addressed to the people and not to Martha. We are the reason for the extinction of this bird, and this shows me how much power as well as choice humans have over the rest of the living beings.' Darina points out that the poem invites readers to be 'more sympathetic with the bird'. It is Martha's task, Zoé says, 'to bring to humanity's attention the fatal damage it is capable of and thus prevent extinction on this scale from happening to other species of the animal world'. Thus, she says, Martha's story 'should be made public, to bring about a change in society'. Angelina concludes that 'we need to act now'.

This overview provides an impression of how a school class engages with a poem in an LCC, which ethical questions come up and what lines pupils drew between their literary experience and their own lifeworld. We do not claim that their comments are in any way representative, innovative or complete. Rather, they reveal a genuine learning experience, and we draw on them to illustrate how a literary text can promote literary-aesthetic communication skills on the one hand, and awareness of and reflection on food and animal ethical issues on the other.

LCC: beyond its 'Natural Habitat'

Above, we elaborated on how an LCC can ideally serve to raise food and animal ethical topics in a German literature class. As such, we used it in its 'natural habitat', as it were. Departing from there, we argue now how the LCC can be used in interdisciplinary ethics courses. In our Tübingen courses, we have also successfully used Scheuermann's poem in LCCs. The courses were part of one of two course programmes and by design, open to students of different disciplinary backgrounds: *Studium Oecologium* (open to all B.A. students) and the Education Science Studies (open to all M.Ed. students). Both course types focussed on the epistemological question of what (beyond good stories) literature can contribute to the sustainability discourse and which ethical questions emerge along the way. While humanities' students prevailed, many participants had a background in the natural and social sciences respectively. In such contexts, discussing a poem in an LCC served two main purposes. First, it promotes literary-aesthetic communication competence. As many students came from disciplines in which literary texts play no role, the method allowed them to speak about a poem in an informal, open-minded manner. Thus, they became more confident when it came to articulating their own impressions when discussing new texts later in the class. Second, as with the pupils of the Zürich class, LCCs served as entry points for discussing a set of ethical and epistemological issues. Departing from, and building on the students' observations, the classes could then move on to content-related topics such as food and animal ethics questions, different (aesthetical) constructions of human-nature relationships, or decolonial perspectives.

Section 11

Beyond that, LCCs can generally be useful in all teaching formats in which learners are part of an 'interpretative community' (Fish, 1980), i.e. deal with texts that require interpretation. Often interdisciplinary ethics courses are modules in course programmes whose students cannot reasonably be expected to have experience in dealing with philosophical texts. Hence, many struggle with the texts. Here, an LLC can organise a first and low-threshold encounter with a philosophical work, say Kant's 'Groundwork of the Metaphysics of Morals'. The lecturer can, for instance, distribute a text passage with the first few paragraphs when Kant explains his idea of the good will, and then start the conversation by asking students which sentence struck them most, and why. In this way, students can find their entry to the text and start to feel confident talking about a text format that is often alien to them. Obviously, this cannot replace a subsequent, content-oriented reading of a philosophical work, but it can introduce students to the cultural practice of speaking about these works and of developing their own reflected moral standpoint (cf. also Hobson-West and Miller, 2021).

Conclusions

In this paper, we have argued how the LCC can be useful for interdisciplinary ethics classes such as food or animal ethics. This method has been developed in the context of the German-speaking literary didactics, especially to support learners' literary-aesthetic communication competence. We elaborated how the LCC can, in addition, serve to start food and animal ethical learning processes in a German literary class. Built on that, we continued by explaining how discussing literary texts in LCCs create entry points to different ethical questions in interdisciplinary ethics classes. Obviously, if a lecturer does not believe in using literary texts in ethics classes, they will find the method less interesting. However, as the LCC is also about supporting the reading and communication competencies of members of an 'interpretative community', it can be employed to introduce philosophical works to students so far unfamiliar with the text genre. In conclusion, the LCC is a promising method in the ethics teaching toolbox, and it adds to the wider literature on narrative formats in ethics teaching (cf. e.g. Hobson-West and Miller, 2021).

Acknowledgements

We would thank Kamilla Stølen, Uta Müller and Lieske Voget-Kleschin for their feedback on earlier versions of this paper. Simon Meisch acknowledges funding for the CANALS project from the EU Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 895008.

References

- Avery, M. (2014): *A message from Martha: the extinction of the passenger pigeon and its relevance today*. Bloomsbury, London.
- Borgards, R. (2016). Tiere und Literatur. In: Borgards, R. (ed.). *Tiere. Kulturwissenschaftliches Handbuch*. Metzler, Stuttgart, pp. 225-244.
- Cronon, W. (1992). A place for stories: nature, history, and narrative. *Journal of American History* 78(4): 1347-1376.
- De Waal, Frans (1999). Anthropomorphism and anthropodenial: consistency in our thinking about humans and other animals. *Philosophical Topics* 27(1): 255-280.
- Fehling, J. (2009). Ethik als Schlüsselkompetenz in Bachelor-Studiengängen: Konzeptionen, Materialien, Literatur. Internationales Zentrum für Ethik in den Wissenschaften, Tübingen.
- Fish, S. (1980). *Is There a Text in This Class? The Authority of Interpretive Communities*. Cambridge, MA, Harvard University Press.
- Haker, H. (2010). Narrative Ethik. *Zeitschrift für Didaktik der Philosophie und Ethik* 2: 74-83.

- Hofer-Krucker Valderrama, S. and Weber, C. (2020). Das Dialogische Lernen als allgemeindidaktischer Rahmen für gelingende Literarische Unterrichtsgespräche. In: Heizmann, F., Meyer, J. and Steinbrenner, M. (eds). Das Heidelberger Modell des Literarischen Unterrichtsgesprächs im Diskurs der Deutschdidaktik. Schneider, Baltmannsweiler, pp. 133-157.
- Meisch, S. (2019). I want to tell you a story: how narrative water ethics contributes to re-theorizing water politics. *Water* 11(4), 631; <https://doi.org/10.3390/w11040631>.
- Meisch, S. and Hofer-Krucker Valderrama, S. (2022). Am Beispiel von Martha. z.B. *Zeitschrift zum Beispiel* 6 (forthcoming).
- Hobson-West, P. and Miller, K. (2021). Telling their own stories: encouraging veterinary students to ethically reflect. *Veterinary Record* 188(10): e17; <https://doi.org/10.1002/vetr.17>.
- Schorger, A.W. (1955). *The passenger pigeon: its natural history and extinction*. University of Wisconsin Press, Madison.
- Spinner, K. (2016). Literarisches Lernen. *Praxis Deutsch* 200: 6-16.
- Steinbrenner, M. and Wiprächtiger-Geppert, M. (2010). Verstehen und Nicht-Verstehen im Gespräch. Das Heidelberger Modell des Literarischen Unterrichtsgesprächs. *Leseforum Schweiz* 3; tinyurl.com/5cyxf8d.
- von Matt, P. (1995). *Verkommene Söhne, mißratene Töchter. Familiendesaster in der Literatur*. Hanser, München.

Author index

- A**
- Aerts, S. 235
 Ahmed, H. 251
 Alvåsen, K. 251
 Andersen, S.S. 489
 Anguilano, L. 454
 Armstrong, B. 365
 Auer, U. 344
 Awasthi, A. 89
 Azevedo, A. 495
- B**
- Bachmann, A. 401
 Bae, J. 449
 Battaglini, L.M. 282
 Berg, C. 251
 Berther, E.T. 21, 173
 Beye, A. 40
 Blair, K.J. 265
 Blok, V. 424
 Bøker Lund, T. 356
 Bolhuis, J.E. 513
 Bonekamp, G. 300
 Borgdorf, L. 406
 Bovenkerk, B. 205
 Brando, S. 271
 Bremer, S. 69
 Bridge, G. 365
 Broomfield, C.Y. 180
 Bruce, A. 295
 Bruce, D.M. 295
 Bubeck, M.J. 315
- C**
- Cairns, L. 392
 Camara, L. 40
 Camenzind, S. 277
 Carson, S.G. 418
 Cavalleri, J.-M. 344
 Choi, T. 449
 Christensen, T. 371
 Chun, M.S. 340, 387, 449
 Ciecierska-Holmes, N. 211
 Collins, Z. 28
 Cornale, P. 282
 Corr, S.A. 356
 Corson, M.S. 145, 165
- D**
- de Boon, A. 34
 Deelen, E. 322
 de Greef, K.H. 300
 Deininger, K. 217
 Denver, S. 371
 Deroche-Leydier, Y. 21
 Dieck, K. 223
 Diraison, M. 145
 Dressel, S. 34
 Dulac, P. 145
 Dunn-Sigouin, E. 69
 Dürnberger, C. 328
- E**
- Eckl, K. 501
 Edgar, D. 186
 Efstathiou, S. 412
 Eggel, M. 229
 Emanuelson, U. 251
 Escajedo San-Epifanio, L. 381, 507
 Espinosa Flor, S.I. 109
- F**
- Fallon, N. 454
 Farruggia, A. 173
 Felber, S. 40
- G**
- Gamborg, C. 115, 159, 375
 Giersberg, M.F. 288, 481, 513
 Gjerris, M. 375, 489
 Gmür, D. 40
 Grimm, H. 240, 344, 356, 501
- H**
- Haller, T. 40
 Hansson, H. 251
 Hartstang, S. 288
 Hempel, M. 69
 Heyndrickx, L. 235
 H.M.G. van der Werf 165
 Hofer-Krucker Valderrama, S. 519
 Huth, M. 334
- I**
- Inza-Bartolomé, A. 381

Author index

J

Jaacks, L.	89
Jenner, F.	344
Jensen, F.S.	115
Joo, S.	340, 387, 449
Jørgensen, S.	251
Jung, Y.	340

K

Kaiser, M.	46
Kallhoff, A.	121
Karg, J.	277, 334
Katz, T.	126
Kelemen, Z.	344
Koksvik, G.	460
Kortetmäki, T.	52
Kramer, K.	205, 295, 406
Kristensen, A.T.	356
Kunzmann, P.	288

L

Lasa López, A.	58
Linder, E.	240
Liu, L.X.	95, 101
Long, M.	344
Lopez, N.	63

M

Magalhães-Sant'Ana, M.	495
Maher, A.	180
Martin, A.	229
McBride, S.	132
McGlacken, R.	245
Meijboom, F.L.B.	295, 306, 322, 406, 481, 513
Meisch, S.P.	69, 138, 519
Mimosi, A.	282
Mondière, A.	145, 165
Moran, D.	186, 265
Moyano-Fernández, C.	152
Myhr, A.I.	418
Myskja, B.K.	418, 460, 466

N

Nelke, A.	350
Nordström, J.	371
Norman, M.	271

O

Ollier, C.	40
Owolodun, B.	40

P

Palmer, C.	159
Paterson, S.K.	454
Persson, K.	350
Prabhakaran, P.	89
Preuss, D.	288

R

Rachinas-Lopes, P.	271
Reid, K.	392
Rijssenbeek, J.	424
Rivera, X. Schmidt	365
Robaey, Z.	424
Robinson-Miles, T.	392
Roch, B.	173
Röcklinsberg, H.	251
Rodenburg, T.B.	513
Rose, D.C.	34
Roy, A.	89

S

Sabet, F.	76
Salter, K.	257
Salzani, C.	428
Sandhu, A.	365
Sandin, P.	434
Sandøe, P.	115, 159, 356
Sandström, C.	34
Schmidt, J.J.	138
Schmidt Rivera, X.	454
Schübel, H.	192
Selter, F.	350
Siguier, D.	145
Sixt, G.N.	82
Smolders, L.F.E.	322
Springer, S.	356
Stetkiewicz, S.	365
Strøm-Andersen, N.	475
Strzepek, K.	82

T

Thomas, V.	145, 165
Tobias, T.J.	322
Trøite, M.F.	466
Tyfield, D.	95, 101

V

van der Sluis, M.	300
van der Werf, H.M.G.	145
van Gerwen, M.A.A.M.	306

van Putten, A.	481	Weisberg, Z.	428
Veluguri, D.	89	Whiting, M.	495
Vogt, J.	365	Willemsen, A.	401
		Winther, H.	440
W			
Wallimann-Helmer, I.	126, 132, 198	Z	
Weber, T.	350	Zhang, J.	95, 101

