



## OPEN ACCESS

EDITED AND REVIEWED BY  
Patrick Meyfroidt,  
Université Catholique de Louvain, Belgium

\*CORRESPONDENCE  
Evan Bowness  
✉ ebowness@uwo.ca

RECEIVED 21 March 2025  
ACCEPTED 26 March 2025  
PUBLISHED 11 April 2025

CITATION  
Bowness E, Mukiri J, Ruder S-L, Hase-Ueta M,  
Morais-da-Silva RL, Newell R and Glaros A  
(2025) Editorial: The social implications of  
cellular agriculture and the future of food.  
*Front. Sustain. Food Syst.* 9:1597622.  
doi: 10.3389/fsufs.2025.1597622

COPYRIGHT  
© 2025 Bowness, Mukiri, Ruder, Hase-Ueta,  
Morais-da-Silva, Newell and Glaros. This is an  
open-access article distributed under the  
terms of the [Creative Commons Attribution  
License \(CC BY\)](#). The use, distribution or  
reproduction in other forums is permitted,  
provided the original author(s) and the  
copyright owner(s) are credited and that the  
original publication in this journal is cited, in  
accordance with accepted academic practice.  
No use, distribution or reproduction is  
permitted which does not comply with these  
terms.

# Editorial: The social implications of cellular agriculture and the future of food

Evan Bowness<sup>1\*</sup>, Jessica Mukiri<sup>2</sup>, Sarah-Louise Ruder<sup>3</sup>,  
Mariana Hase-Ueta<sup>4</sup>, Rodrigo Luiz Morais-da-Silva<sup>5</sup>,  
Robert Newell<sup>6</sup> and Alesandros Glaros<sup>6</sup>

<sup>1</sup>Department of Geography and Environment, Western University, London, ON, Canada, <sup>2</sup>Institute for Resources, Environment and Sustainability (IRES), University of British Columbia, Vancouver, BC, Canada, <sup>3</sup>School of Sociological and Anthropological Studies, University of Ottawa, Ottawa, ON, Canada, <sup>4</sup>Philosophy Group, Wageningen University & Research, Wageningen, Netherlands, <sup>5</sup>School of Business and Management, Federal University of Paraná, Curitiba, Paraná, Brazil, <sup>6</sup>School of Environment and Sustainability, Royal Roads University, Victoria, BC, Canada

## KEYWORDS

cellular agriculture, just transition, ecological limits, industrial food system, social and ecological change, social inequities

## Editorial on the Research Topic

### The social implications of cellular agriculture and the future of food

Cellular agriculture has been widely promoted as a technological solution to myriad problems with conventional food systems. Cellular agriculture products are grown from culturing cells, including cultivated meat, dairy proteins from animal cells, and ingredients like cocoa and coffee from plant cells (Barzee et al., 2022). Proponents argue that it offers a way to produce animal-based proteins and other agricultural goods with lower greenhouse gas emissions, reduced land use, and fewer ethical concerns. However, while framed as a promising innovation, cellular agriculture remains embedded in longstanding assumptions—that food systems must continually expand to meet rising demand, economic growth should drive agricultural innovation, and technology can overcome ecological and social limitations. These assumptions conflict with evidence that global food systems face severe critical threats including climate change (Malhi et al., 2021), resource constraints (Rockström et al., 2023), and, increasingly, geopolitical instability (El Bilali and Ben Hassen, 2024).

In April 2022, members of the editorial team launched this Research Topic at a workshop entitled *The Social Implications of Cellular Agriculture and the Future of Food*, held on the traditional and unceded lands of the Katzie Nation in western Canada. The event convened researchers, NGOs, Indigenous elders, and cellular agriculture technology developers to examine the potential benefits and risks of this emerging technology to discuss the tension between its transformative potential and its entrenchment within existing harmful paradigms behind dominant approaches to food production. The theme is an underlying thread connecting the eight articles in this Research Topic.

## Transformation or entrenchment?

Glaros et al. provide a framework for identifying the potential trajectories along the dimensions of centralization, access, and integration. Their framework maps different possible futures for the cellular agriculture industry. For example, they find that stakeholders hold varying perspectives on the extent to which venture capital investment and consolidation is a “good” thing and/or necessary direction for cellular agriculture. This suggests that future industry pathways will require negotiation, likely fraught with tension across competing worldviews.

Hibino et al. and Powell et al. explore consumer attitudes toward cellular agriculture products in Japan and Canada, respectively. Hibino et al. identified a mix of enthusiasm and skepticism toward cultured meat, with concerns about “unnaturalness,” food safety, and transparency tempering optimism about its ethical and environmental benefits. Powell et al. analyzed attitudes toward yeast-derived dairy, finding that while some consumers appreciate its potential advantages, concerns about food processing and corporate control remain concerns. These studies suggest that consumer acceptance depends on several factors, including concerns about transparency, regulation, safety, and cultural values about food.

Beyond consumer attitudes, the economic implications of cellular agriculture for existing food producers deserve attention. Manning et al. examined UK farmers’ perspectives on cultured meat, identifying widespread concerns about corporate control, land-use displacement, and rural marginalization. Farmers largely perceive cellular agriculture as a corporate-driven approach to food production, and fear that small and mid-scale producers will be excluded from its economic benefits. To address these risks, the cellular agriculture industry must be developed in a way that prioritizes equity. Rao et al. argue for a “just transition” approach, emphasizing the need for community engagement, interdisciplinary collaboration, and transparent governance mechanisms. Without such measures, they caution that cellular agriculture risks reinforcing existing patterns of exclusion.

Other contributors provide structural critiques of cellular agriculture’s position within the broader food system. Jiménez Rodríguez draws on vegan queer ecofeminist theory to critique the capitalist and patriarchal structures that shape the industry, arguing that these structures limit its transformative potential. They also highlight the industry’s reliance on animal-derived inputs, such as fetal bovine serum. Similarly, Hedberg critiques the narratives used to justify cellular agriculture’s development, particularly the “bad animal narrative,” which blames livestock for environmental degradation while overlooking systemic failures in industrial agriculture. Through a review of life cycle assessments (LCAs), Hedberg shows how techno-fix approaches often obscure the complexities of sustainable food systems and risk reinforcing existing power asymmetries. Finally, Poirier offers a historical perspective, arguing that cellular agriculture is less of a departure from industrial animal agriculture than its proponents claim. He highlights the industry’s close ties with conventional meat corporations, questioning whether its primary objective is to serve the public good or to extend existing agribusiness models into biotechnology.

## A just transition or just another transition?

Taken together, these studies highlight the competing forces that can shape the future of cellular agriculture. While some argue that this technology holds the potential to mitigate ethical and environmental harms associated with industrial animal-based food production, others caution that its trajectory may simply reproduce (and perhaps even exacerbate) many of the current environmental and social justice issues associated with the food system. Although many questions remain unanswered and new ones continue to emerge from the papers in this Research Topic, two key directions for future research stand out.

First, as suggested by Rao et al., future research on cellular agriculture should adopt a “just transition” perspective (Moritz et al., 2024), ensuring that its development does not reproduce existing inequities but instead fosters more inclusive and democratic food systems. This means centering the needs of potentially affected communities, ensuring accountability in research and development, and preventing the continued consolidation of power among dominant actors.

Second, in line with arguments made by Jiménez Rodríguez, Hedberg, and Poirier, there is a need to interrogate the deep cultural assumptions and perceived entitlements underpinning the growing interest in cellular agriculture. This raises questions about the viability of indefinite economic expansion on a finite planet, the long-term sustainability of globalized industrial food production, and the limits of technological solutions to systemic food and ecosystem crises. Rather than looking to how new food technologies will sustain “business as usual, but greener” (Baskin, 2019, cited in Stein, 2024), scholars and policymakers must confront the reality that food production operates within real biophysical and geopolitical constraints. These constraints demand urgent analysis on the gap between hopes for ecological modernization and the actual pathways to bring human societies in line with the boundaries for Earth system’s integrity (Rockström et al., 2023).

The trajectory of cellular agriculture remains uncertain. Its development raises a fundamental question: Will this technology disrupt the social and ecological harms embedded in industrial food systems, or will it replicate them?

## Author contributions

EB: Writing – original draft, Conceptualization, Funding acquisition, Writing – review & editing. JM: Writing – review & editing. S-LR: Writing – review & editing. MH-U: Writing – review & editing. RM-d-S: Writing – review & editing. RN: Writing – review & editing. AG: Writing – review & editing.

## Funding

The author(s) declare that financial support was received for the research and/or publication of this article. This editorial and Research Topic were supported by the Social Sciences and Humanities Research Council (Award 611-2021-0205).

## Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

## Generative AI statement

The author(s) declare that Gen AI was used in the creation of this manuscript. OpenAI's ChatGPT (GPT-4-turbo, model: gpt-4o

mini, accessed via chat.openai.com) was used to refine wording and improve readability.

## Publisher's note

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

## References

- Barzee, T. J., El Mashad, H. M., Cao, L., Chio, A., Pan, Z., and Zhang, R. (2022). Cell-cultivated food production and processing: a review. *Food Bioeng.* 1, 4–25. doi: 10.1002/fbe2.12009
- Baskin, J. (2019). "Global justice and the Anthropocene: Reproducing a development story," in *Anthropocene Encounters: New Directions in Green Political Thinking*, eds. F. Biermann and E. Lovbrand (Cambridge University Press), 150–168.
- El Bilali, H., and Ben Hassen, T. (2024). Disrupted harvests: How Ukraine – Russia war influences global food systems – a systematic review. *Policy Stud.* 45, 310–335. doi: 10.1080/01442872.2024.2329587
- Malhi, G. S., Kaur, M., and Kaushik, P. (2021). Impact of climate change on agriculture and its mitigation strategies: a review. *Sustainability* 13. doi: 10.3390/su13031318
- Moritz, J., Mazac, R., Ueta, M. H., Rätty, N., Tuomisto, H. L., and Rynänen, T. (2024). Prospects of justice for cellular agriculture: a just transition or reinvesting in unsustainability? *Food Ethics* 9:22. doi: 10.1007/s41055-024-00156-8
- Rockström, J., Gupta, J., Qin, D., Lade, S. J., Abrams, J. F., Andersen, L. S., et al. (2023). Safe and just Earth system boundaries. *Nature*. 619, 102–111.
- Stein, S. (2024). Universities confronting climate change: beyond sustainable development and solutionism. *High. Educ.* 87, 165–183. doi: 10.1007/s10734-023-00999-w