11 JUNE 2025 09.00 - 11.00

Panel 27. Problematizing Science, Technology, and Culture through 'Cultured Food'

Convenor:

Fatih Tatari, Politecnico di Milano

Keywords: Cultured food, biotechnology, cellular agriculture, cultured meat, food science, nature/ culture

This panel aims to discuss the science and technology behind what has been called "cultured food". Isolating microorganisms and multiplying them in order to "culture food" in the laboratories have become an increasingly widespread practice in different parts of the world for many decades. After years of biotechnological engineering in food sciences, the rise of "cellbased food" and "cellular agriculture" have recently been shaping the cutting- edge research. "Cultured" or "artificial" meat and dairy products are at the heart of these emerging technosciences. While these food technosciences are promoted as one of the key solutions to the contemporary problems of climate change, unsustainable food systems, and food safety, they are yet far from being accessible as well as "effective" or "successful" – not only due to the premature research and development efforts or profitability concerns of the companies but also a significant public opposition fueled by various social movements, and the legislative actions already taken by different governments to prohibit the production and circulation of "cultured food". From an STS perspective, these food technosciences offer a fruitful empirical ground to address the controversies in our field, such as the nature/culture divide, agency of nonhumans, power relations shaping science and technology, complex interplay between scientific knowledge and policymaking, among others. Problematizing the "culture" in "cultured food", this panel welcomes contributions in form of traditional presentations that reflect on how food has been cultured by scientists, engineers, designers, and companies.

Topics may include, but are not limited to, the following:

- History of scientific knowledge production on and technosciences of culturing food
- Visions and concerns shaping scientific research on cultured food
- Ethnographic research on the practices of culturing food in laboratories
- Political economy of cultured food and cultured meat
- More-than-human communities of scientific research on cultured food
- Non-human agency in culturing food
- New perspectives on the food safety and/or food sovereignty of culturing food
- Ethical issues in culturing food
- Reactions and resistances to the cultured food

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ID 678 - Meat Without Bodies: Ontologies, Ecologies, and the Culture of Cellular Agriculture

Elisabeth Abergel, Université du Québec à Montréal

Keywords: Ontologies, Cultured Meat, Cellular Agriculture, meat imaginaries, biotechnologies, cellular and tissue economies

This paper explores the political ecology of cultured meat, drawing from my recently published book, Dead Meat: Cellular Meat Imaginaries, Competing Vitalities, and Anthropocene Diets. Cellular agriculture, often positioned as a technological fix to the environmental and ethical crises of industrial livestock production, operates at the intersection of biotechnological innovation, capitalist food regimes, and meat imaginaries.

Through a critical examination of the culture of cultured meat, this presentation interrogates how cellular meat is not merely a scientific artifact but a socio-political project embedded in specific visions of nature, life, and sustainability.

Using a political ecology framework, I analyze how cellular meat reconfigures relationships between humans, non-human animals, and the environment. The discourse surrounding cultured meat frequently promises a future of ""clean"" meat, free from the ecological devastation associated with traditional animal agriculture. However, these narratives often obscure the extractive dynamics underpinning the production of cellular meat, including the reliance on monocultures for growth media, energy-intensive bioreactors, and the perpetuation of techno-solutionist logics that depoliticize structural issues related to food systems and environmental degradation.

Far from being a disruptive industry, cellular agriculture relies heavily on established technologies from the biomedical field and fermentation techniques that have been adapted to food production. Despite these adaptations, the industry faces significant technological and funding hurdles, challenging the promises and optimistic projections often associated with its growth and scalability.

This presentation also engages with the ontological implications of cellular meat as a form of ""lively capital,"" drawing on science and technology studies (STS) and critical food studies. By examining the commodification of cellular life, I argue that cultured meat represents not a break from industrial food paradigms but an intensification of biocapitalist processes where life itself, via cellular and tissue economies, becomes a site of extraction and accumulation. As a result, the promise of post-animal bioeconomies is pitted against rural livelihoods as forms of competing vitalities. The ontological status of animals is particularly complicated in the context of cultured meat. While it promises to eliminate the need for slaughter, it simultaneously reduces animal life to biological raw materials—cells harvested, cultured, and optimized for human consumption. This abstraction of animality raises profound questions about the erasure of animal agency and the ethical implications of disembodied life forms, reinforcing the instrumentalization of animals within capitalist food systems.

Methodologically, this research is grounded in three years of participant observation at cellular agriculture conferences in the United States, combined with discourse analysis of industry narratives, policy documents, and scientific publications. This approach reveals the environmental and food future imaginaries and contested politics that shape the emergence of cellular meat, challenging the dominant techno-utopian visions and eco-modernist frames that portray it as a neutral or inherently sustainable and desirable innovation.

Finally, exploring the culture of cultured meat requires a critical engagement with both the material and immaterial dimensions that sustain its development, illuminating the contradictions and tensions inherent in techno-solutionist responses to the Anthropocene.

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ID 728 - Pasteurized Pastorilst Food Technologies; Ferments, Value and Collective Life in Mongolia

Björn Reichhardt, Humboldt-Universität zu Berlin

Keywords: Ferments, Microbes, Pastoralism, Biowealth, Mongolia

In this paper, I investigate dairy ferments as sources of wealth in Mongolian pastoralism. By drawing on ethnographic and scientific fieldwork, I discuss how dairy starter cultures generate multispecies well-being in face of severe challenges stemming from global trade networks, neocolonial food systems, bio-engineering, and environmental destruction.

Recent literature in anthropology and STS addresses how localized heritage biowealth becomes integrated into the dynamics of global capitalism and biopolitics, often resulting in the alienation of these valuable biosocial entities (Livingston 2019; Yates-Doerr 2017; Tsing 2015). In Mongolia these dynamics seem to be

inversed. Human-microbe interactions rooted in dairy pastoralism are slowly undermined by the introduction of allegedly superior ferments from large European biotech companies. These European starters are considered superior because they are standardized and thus considered more stable and profitable. Homemade ferments, to the contrary, are devalued by being considered too sour, unstable, and unclean, echoing orientalist tropes figuring pastoralism as "backward".

Against these tropes, I investigate standardized and pastoral dairy ferments within capitalist modes of production vis-à-vis multispecies timescapes and gendered biosocial knowledge systems. I argue that pastoral ferments embody stability and continuity by being neatly incorporated into domestic micro-ecologies, maintained by the often-unacknowledged meticulous work of herder women.

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ID 774 - Culturing Meat: Enacting naturecultures with care

Mehmet Fatih Tatari, Politecnico di Milano

Keywords: cultured meat, care, nature, culture, natureculture, history of science

Many scientists and start-up companies support cellular agriculture and the technoscience of lab-grown food as the emerging solution or technological fix to the disastrous ecological effects of our global food systems. Yet some countries like Italy have already banned the commercialization of "cultured meat." This presentation relies on my ongoing research on scientific knowledge production on "cultured meat." Relying on the history of science that paved the way for the contemporary technosciences of cultured meat, I problematize the natureculture of the lab-grown meat. Through ethnographic research in Italy, I investigate the ways in which scientists and engineers continue to work on developing this technology despite the national ban on the commercial products of cultured meat. I analyze the narratives of the scientists who highlight the stark contrast between public reactions to the biomedical application and the public reactions to the food technosciences of tissue engineering. In this working paper, my analysis focuses on 1) the ways in scientists' practices in the laboratories enact 'nature' and 'culture' of the culture meat, 2) what practices of 'care' in the laboratory circumvent the notion of 'care' employed by the proponents and opponents of the cultured meat.

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ID 897 - In search of the Microbial Path to Terroir. Technoscience for Good (Natural) Cheese

Elise Demeulenaere, Centre Alexandre Koyré d'Histoire des sciences et des techniques

Keywords: food

At the crossroads between food studies and science and technology studies, this presentation analyzes the role of laboratories located within traditional cheese territories in the ecologization of cheese microbiology in France at the turn of the twentieth century. I argue that their connectedness with Protected Designation of Origin (PDO) raw-milk cheese organizations advocating for a strong understanding of terroir played a key role in challenging the modern strain-by-strain approach and fostering a shift towards a new research object: microbial communities in their ecologies. Modernization and standardization in cheese production from the 1950s onwards laid indeed on the improvement of hygiene to get "cleaner" milks, and on lab research on microbial strains to develop selected starter cultures. This led to a dramatic loss of microbial abundance within raw milks, which progressively provoked milk processing issues, as well as a loss of cheese typicality, an issue for "place-based cheeses". To face it, the modernist approach promoted more lab research on microbial strains to develop new starter cultures and the creation and diversification of microbial collections, within an ex-situ conservation framework. In contrast, microbiologists conducting applied research for raw-milk terroir cheeses investigated environmental microbial reservoirs, microbial fluxes, as well as farming practices that favor "natural seeding" (formerly called by modernists, "contam-

ination"), and enrich milk native microflora. Together, these changes in cheese microbiology contributed to the construction of a new approach, namely "practice-driven microbial ecology" (écologie microbienne dirigée), which enacts the dynamic and ubiquitous properties of microbial life. The paper offers a situated account on the "microbial (ecology) turn" described by other authors, highlighting the original path that applied scientists in France followed to solve the puzzle of microbially impoverished milks: in their own terms, "the microbial path to terroir".

In the frame of this STS Italia conference dedicated to "technoscience for good", I propose to interpret this path both as a repair work to mitigate the side-effects of farming modernization (biocultural standardization), and a caring work for microbial ecosystems and associated farming practices.

In the frame of a panel dedicated to ""culturing food"", I propose to view it also as a path towards ecologizing food production. I will open a discussion about the partial connections between this French move with the Italian Slow Food movement for Natural Cheeses.

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ID 901 - Reimagining Cultivated Meat: Addressing Animal Futures in the Debate for a Just Food Transition

Arianna Ferrari, Austrian Institute of Technology

Keywords: cultivated meat, socio-epistemic practice, ethical implications, STS, foresight, sustainable food transition

The rise of cultivated meat and fish, hailed as a transformative innovation to address the ethical and environmental issues associated with traditional animal agriculture, has sparked both enthusiasm and significant controversy. While advocates present this technology as a potential solution to global food security, health challenges, and animal welfare concerns, its political, social, and ethical dimensions remain highly contested. This paper critically examines cultivated meat as a socio-epistemic practice, exploring how it reshapes ethical norms and mobilizes conflicting political alliances, such as those between animal rights organizations and conventional meat industries. While these alliances may seem pragmatic, they expose deeper ethical compromises and raise vital questions about the true implications for animal welfare in the emerging food system (Ferrari and Lösch, 2017).

The debate over cultivated meat's potential to facilitate a sustainable food transition positions it as a key innovation within the expanding field of alternative proteins. Despite advancements in bioreactor technology and cost-reduction strategies, such as animal-free cell media, significant challenges persist—especially in scaling production and securing regulatory approvals. The early commercial rollout of cultivated meat in Singapore (2020), followed by its introduction in the US and Hong Kong, initially generated optimism. However, increasing political and social resistance—evidenced by bans in Italy, the US, and proposed initiatives across Europe—highlights the deep-rooted opposition to changes in agricultural practices. This resistance is often rooted in a refusal to acknowledge the ecological impacts of animal food production in the context of climate change and biodiversity loss, as well as a defense of animal husbandry as a cultural heritage that maintains a connection to nature through practices like transhumance tourism and the protection of locally sourced products (Ferrari, 2024).

In the midst of the hype and political contestation—where defenders of industrial livestock farming and their lobbying power clash with progressive calls for change—critical ethical dimensions are often overlooked. The debate on cultivated meat remains largely confined to theoretical or speculative discourse, with insufficient focus on the evolving, practical implications of the technology—particularly in terms of its ongoing reliance on animals in production processes. This paper identifies a significant gap in the discourse: the lack of a comprehensive assessment of the impact on animal bodies and the future of animals still implicated in the production of cultivated meat and fish (cf. Dutkiewicz, J., Abrell, 2021). This oversight distorts our understanding of the normative dimensions of this innovation, presenting an incomplete picture of its consequences.

To address these gaps, the paper proposes integrating Science and Technology Studies (STS) and foresight methodologies with a specific focus on the implications for nonhuman animals. Such an approach ensures that the roles and futures of animals are central to ethical and policy frameworks, encouraging more thorough and nuanced discussions about the role of cultivated meat and fish in a just and sustainable food transition.