



# Novel Foods: a Technological Pathway to Food System Transformation? An Introduction

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## Abstract

This Special Section intends to contribute to the debate within the social sciences on ‘novel foods’, broadly understood as foods providing proteins alternative to animal proteins. These are derived from a variety of new bioscientific and engineering technologies spanning cell tissue development; organisms covering plants, fungi, algae and microbes, and insects. The articles gathered in this Special Section are the outcome of the biennial 2023 Conference of the Center for Food Studies of The American University of Rome. Novel Foods are discussed from different disciplinary perspectives and their various configurations, regulatory challenges and degree of social acceptance are considered in a variety of economic, political, social and cultural contexts. Taken together, the articles reveal the array of social science questions to be tackled if ‘novel foods’ are to be part of a transition towards food system transformation, or whether they will ultimately accentuate ‘high-tech solutionism’ and associated narratives that work to the detriment of deeper and more democratic analyses and solutions.

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## Bibliographical notes

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As part of its biennial programme of conferences, the Centre for Food Studies at The American University of Rome convened a one-day conference in March 2023 under the patronage of the European Society for Rural Development, and with practical support provided by students on the Master in Food Studies, entitled 'Novel Foods and Novel Food Production: a Solution to Food Systems Sustainability?'. The event – and the present Special Section that brings together a selection of invited papers from the Conference – follows the success of a similar previous initiative on sustainable diets (Sage et al., 2021). The decision to convene a conference on the topic of novel foods was taken in light of the rising public interest in meat, fish, and dairy alternative products that are increasingly finding their way onto supermarket shelves and the menus of mainstream food service establishments. It seemed appropriate and timely to take stock of developments within a food studies milieu.

The Conference allowed for a generous interpretation of the term 'novel foods' stretching from the development of enclosed plant growing systems (controlled environment agriculture) to the field of 'alternative proteins'. Statutorily within the EU, the term 'novel foods' refers to any food that has not been consumed to a significant degree by humans in the EU before May 1997. However, we recognise an emerging consensus that novel foods are most closely associated with providing alternatives to animal proteins, although the bioscientific and engineering technologies embraced here span cell tissue growth, plants (including fungi and algae), insects and micro-organisms.

The rationale of the Conference was the realisation that an unparalleled wave of food product innovations is sweeping through the global food system, pushed by a new generation of food start-ups which, with the help of a novel innovation ecosystem, are introducing products which are increasingly independent of their original raw materials. The central focus is on producing substitutes for the animal protein food/feed chains since these are seen as the principal source of biodiversity loss, climate change and land utilisation by agricultural activities. These innovations depend heavily on the so-called disruptive technologies of big data analysis, machine learning and artificial intelligence for the identification of new molecules with precise physical and functional characteristics. They also draw on advances in biotechnology for gene editing, precision fermentation and cellular cultivation. At the same time, there are considerable developments in indoor farming systems and vertical farming, integrated into urban life and aimed at freeing fresh produce production from the risks and rhythms of the natural environment.

Food security and food sustainability as the key global challenges of a world that combines continued population growth with accelerating urbanisation and rapid depletion of natural resources are claimed as high on the list of motives of the food start-ups also associated with 'mission-oriented' entrepreneurs. The leading players in the food systems are themselves now investing in and exploring these new product lines. From the initial domination of U.S. firms and finance capital, the phenomenon has now become global with a proliferation of high-tech food hubs, often stimulated through public policies and funding, especially in countries with abundant capital, but limited natural resources.

At the Conference, the positive aspects of novel foods and their potential 'to feed the world without devouring the planet' were emphasised by the first keynote speaker, George Monbiot (journalist and environmental activist). A global geo-political and economic perspective was given by John Wilkinson (Federal Rural University of Rio de Janeiro), illustrating the increasing importance of new players of the Global South, especially Brazil and China, in the adoption of agrifood innovations, despite the persisting centrality of the Global North (Wilkinson, 2024). A European perspective on novel foods, including their definition and regulations was given by Andrea Germini (the European Food Safety Authority, EFSA). The state of the art of controlled environmental agriculture was presented by Luca Nardi (Italian National Agency for New Technologies, Energy and Sustainable Economic Development, ENEA), drawing on the Agency's applied research. The final keynote speech was provided by Larissa Zimberoff, a freelance journalist, who unveiled the social reality and hype characterising the start-up world. Her intervention was based on the ethnographic account of her



investigative reporting and encounters with the food entrepreneurs of Silicon Valley (Zimberoff, 2021). Colin Sage then wrapped up proceedings drawing together some of the issues raised by the keynote speakers as well as highlighting several of the themes addressed by the 29 papers presented across the four parallel sessions of the day.

Out of the papers presented, the Editorial Team selected the articles that constitute this Special Section. The articles cover a range of topics drawing upon the social science disciplines of political economy, anthropology, history, and public policy. This Special Section, and each article individually, raises searching questions about these novel innovations in food production, particularly the question of whether they can be part of the universally anticipated food systems transition. The academic community has a role to play, particularly in trying to integrate the knowledge and tools of analysis from different epistemologies and disciplinary fields, spanning the biological, ecological and the social dimensions. Social scientists are particularly well suited to connecting policy making and civil society at large; and we hope that the articles presented here will contribute to this interdisciplinary endeavour stimulating a broader debate on the place of novel foods in the context of food system transition.

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