https://doi.org/10.1038/s43016-024-00960-9

# On the value of food systems research



**Every study has limitations; the question is whether it moves the field forward and what this entails for each community.**

A great deal of research is exclusively assessed in terms of technical quality, a metric that is arguably easier to measure in exact than non-exact sciences and that doesn't say much about the impact of the research results to society. Its relevance is therefore limited when it comes to food systems research, which involves social and cultural elements and is motivated by grand societal challenges such as the fight against hunger, poverty and climate change. Questions related to food security and the sustainability of food systems, no matter whether they are approached through a nutritional, environmental or socioeconomic lens, tend to involve a great deal of complexity and context specificity.

Given the above, a question we ought to ask when assessing a food systems study is whether it moves the field forward and offers a substantial contribution despite its limitations. Equally important is to ask whether these limitations are transparently laid out. Ideally, the study would have a well-defined analytical framework and discuss the potential implications of its main assumptions, particularly if they are likely to change conclusions in a significant way. The line that marks the divide between 'substantial' and 'non-substantial' or 'significant' and 'non-significant', as used above, is to be drawn by the relevant research community — and is bound to change over time, based on that community's understanding of what is useful or insightful in light of the field's uncertainties. In the scientific peer-review process, the feedback of reviewers — as representatives of the research community — is key to making such a call.

What makes a piece of research valuable when it comes to food systems isn't

necessarily its degree of technical advance, but rather the conceptual advance it represents and the potential impact associated with it. For instance, the angle through which a problem is addressed and how it is framed can yield arresting and important conclusions, even when calculation methodologies remain unaltered. This point is well illustrated by food-related greenhouse gas (GHG) emissions, which were traditionally reported for each sector (transport, energy, industry, and so on) and supply stage (production, processing, distribution, consumption and waste) separately but have been more recently combined under 'systems emissions'. While their breakdown informs sectoral policies, the sum of all GHG emissions is needed for synergies and trade-offs to be properly identified and accounted for[1]. Besides, the global overview of emissions is crucial for creating awareness around the impact of food choices and catalysing mitigation action. The message that food systems are currently responsible for a third of all current anthropogenic GHG emissions[2], so widely publicized, was determinant for food systems to be placed at the centre of the climate agenda and to receive due attention from world leaders.

A recently proposed food classification system based on the degree of food processing that has singled out ultra-processed foods (UPFs)[3] provides another interesting case for reflection on how to evaluate research. Some scientists were critical of this new categorization, arguing that processing in itself isn't what makes a food item good or bad for people and the environment, and highlighting mixed evidence on the impact of UPFs on biochemical risk factors for disease[4]. Others found it extremely useful for eliciting the association between the consumption of UPFs and many of their distinctive characteristics, which are themselves harmful to human health (either directly, like high sugar and/or additive content, or indirectly, through shifts in consumers' preferences towards impoverished diets) and the environment. Undeniably, this classification has stimulated a healthy debate around modern dietary habits, the intricate factors behind them, and public policies' sole focus on nutritional characteristics of foods.

As the examples above suggest, two more points deserve attention when thinking of the value — and contribution — of food systems research. The first point is about clarity over what a study can and cannot answer, and consequently what it should be used for. The combined account of food-related GHG emissions sheds light on food systems' total footprint, underscoring the need for coordinated policies, but doesn't replace sectoral granularity. Likewise, a food classification system based on UPFs may not say much about processing as a food engineering technique, yet it highlights important issues surrounding these products. The second point refers to the scope of the analysis and the multiplicity of aspects that are considered given the urgency of food systems transformation. Whether that's done in a meaningful way and to a sufficient extent is for the food community to judge.

Published online: 20 March 2024

## References


1. Rosenzweig, C. et al. *Nat. Food* **1**, 94–97 (2020).
2. Crippa, M. et al. *Nat. Food* **2**, 198–209 (2021).
3. Monteiro, C. A., Cannon, G., Lawrence, M., Costa Louzada, M. L. & Pereira Machado, P. *Ultra-processed foods, diet quality, and health using the NOVA classification system* (FAO, 2019); https://www.fao.org/3/ca5644en/ca5644en.pdf
4. Gibney, M. J. & Forde, C. G. *Nat. Food* **3**, 104–109 (2022).