



REVIEW ARTICLE

How can food processing achieve food and nutrition security?

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Abstract

In the agri-food chain, while the impact of producers and consumers on sustainability has been well studied, food processing has been less explored. This position paper aims to discuss the potential of food processing to address all food and nutrition security (FNS) outcomes in order to achieve improved food system sustainability. First, FNS dimensions and the four pillars of agro-food industry sustainability are defined, with a focus on ultra-processed foods. Second, the food matrix concept is developed as a new paradigm to holistically address all FNS. It is concluded that food processing should become more involved in circular food systems and bioeconomy, and that we need to relocate food production, processing, and consumption to be more aligned with regional food production specificities. For this, minimal processing to preserve food matrices should be preferred. Therefore, the strong current tendency to develop reductionist and siloed innovative solutions to improve the sustainability of food systems should be questioned.

KEYWORDS

food and nutrition securities, food matrix, food processing, minimal processing, sustainability, ultra-processed foods

1 | INTRODUCTION

Food should not be primarily an economic object: it should be something that helps to improve people's health and well-being while preserving environmental resources. Economic parameters, such as profitability, or revenue generation, should be secondary. Furthermore, we first eat food, not nutrients, and food belongs to a dietary pattern. For health and sustainability, we need to look at food in the context of dietary patterns, not nutrients; and we need to look at diets as a whole, particularly considering food synergies and interactions (Fardet & Rock, 2022a).

Dietary patterns represent an emergent outcome of food systems and need to become sustainable in all dimensions (FAO, 2018; SAPEA, 2023). According to some authors (and stakeholders), the global food system produces more food than is theoretically needed,

with about 3000 Kcal/capita available daily (Wiseman et al., 2019). The same authors acknowledge that global diets have become increasingly poorer in quality since the 1960s onwards. The risk posed by such poor diets is an increase in cardiovascular diseases, early mortality, and morbidity that is now greater than the combined risk of practicing unsafe sex, abusing alcohol, drug and tobacco (GBD, 2019 Risk Factors Collaborators, 2020). In addition, the current mainstream food systems are seriously threatening the planetary boundaries that may ultimately determine human survival (IPCC, 2022; Kemp et al., 2022).

In the food system, which functions through several and inter-linked agri-food chains, while the impact of producers and consumers on sustainability has been studied extensively, the impact of industries in the middle of the agri-food chain has been less studied and too often neglected (Axelos et al., 2020; Fardet & Rock, 2020). Yet, food