Ultra-processed food: a global problem that requires a global solution

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16th October is World Food Day, celebrating the creation of the Food and Agriculture Organization (FAO), a specialised agency of the United Nations, on this day in 1945[1]. The FAO leads international efforts to eradicate hunger, improve nutrition and achieve food security for all. Today, many individuals across the globe face food insecurity, without access or availability to healthy, nutritious food. Barriers including climate change, international tensions and rising prices stand in the way of achieving the FAO goal of global food security. As a result, poor diets are the leading cause of global mortality and a significant contributor to disease burden, resulting in nearly 11 million deaths and 255 disability-adjusted life-years[2]. Since the mid-20th century, much has been understood regarding diet-disease relationships through the study of individual foods and specific nutrients (e.g. saturated fat, added sugar, sodium and fibre), which has shaped national dietary guidelines and dietary policies to date. In the same post-war period, our food environment has been moulded by increasing demands to produce sufficient quantities of long-lasting food due to growing populations. This has led to the industrialisation and globalisation of the food supply with the growing dominance of multinational corporations, revolutionising the types of foods we consume[3]. However, the traditional reductionist approaches to nutrition that focus on isolated nutrients fail to explain how these drastic changes in the food environment have negatively impacted on human health and the environment. We now live in a world where food is global, and ultra-processed.

Ultra-processed foods, as defined by the NOVA classification, are industrially produced formulations, typically consisting of 5 or more ingredients, made using processing techniques and ingredients not used in the home. ultra-processed foods include many of the branded, mass-produced ready meals, breads, pizzas, pasta dishes, sweets, pastries and desserts made by multinational corporations that line the shelves of supermarkets in countries across the globe[4]. Besides their high availability and accessibility, ultra-processed foods are cheap, highly palatable, heavily marketed and typically with an extended shelf life, making them attractive choices[5]. The result? A global nutrition transition in recent decades, with food consumption shifting away from minimally processed food, and towards ultra-processed alternatives[3]. ultra-processed food sales have been greatest in high-income countries in North America, Europe, Latin America and Australasia, but sales elsewhere are catching up, with rapid UPF sales growth particularly in highly populated middle-income countries in South and Southeast Asia, Africa and the Middle East[3].

Diets with higher proportions of ultra-processed foods (in terms of energy intake or weight) are prospectively associated with increased risks of weight gain, total and central obesity, type 2 diabetes, cardiovascular disease, non-alcoholic fatty liver disease, hypertension, dyslipidaemia, gastrointestinal disorders, cancer, poor mental health and all-cause mortality[5]. These associations are independent of age, gender, ethnicity, education, income and lifestyle behaviours, and not limited to high-income countried, with adverse impacts also documented in low-income and middle-income countries[5]. The impact of ultra-processed foods extends across the lifespan, increasing the risk of weight gain, higher body and fat mass indices in children, and associated with decreased grip strength and reduced renal function in older adults[5].

Debate continues regarding whether nutrient content or ultra-processing *per se* drives the poor health outcomes from ultra-processed foods consumption. Ultra-processed foods tend to have a poorer nutritional profile, higher in energy, total and saturated fat, free sugar and sodium, and lower in fibre, protein and micronutrients[5]. They also tend to be more energy dense and highly palatable, promoting increased consumption. Ultra-processing itself may impact on health, such as through the degradation of the food matrix altering the oro-sensory experience of food consumption, influencing eating rates and the onset of satiation, as well as altering nutrient bioavailability[5]. The industrial processes and ingredients in ultra-processed foods, such as excessive heat treatment or additives, might also impact on gut microbiota and lead to low-grade inflammation. However, the nutrient content of ultra-processed foods is insufficient to explain their adverse effects on human health.

Factoring for nutrient intake or overall diet quality does not explain the detrimental epidemiological associations[5], and still results in contrasting differences in energy intake and weight change between ultra-processed and minimally processed diets in experimental evidence[6]. These findings highlight an urgent need for funding and research to understand the mechanistic links between the consumption of ultra-processed foods and adverse health, and which foods are most detrimental.

Ultra-processed foods not only impact on human health, but also the health of our planet. Driven by their intense production and overconsumption, there is a negative environmental impact across the food chain from production, to processing, packaging, distribution, storage, through to consumption[7]. The ultra-processed food supply chain requires large amounts of energy and land, with significant greenhouse gas emissions, land degradation, biodiversity loss and plastic pollution[7]. In Brazil, diet-related greenhouse gas emissions (+21%), water use (+22%) and ecological footprints (+17%) per capita have increased in the past 30 years due to increased ultra-processed food production and consumption, and from a two-fold increase in the per capita environmental impact of this type of food[8].

The current global food system is unsustainable. The global food supply chain accounts for around 30% of total greenhouse gas emissions[9], of which, ultra-processed foods are major contributors[7]. Even with the immediate removal of fossil fuels, current trends in food systems could still impede the Paris Agreement targets of limiting global warming to less than 2°C, let alone 1.5°C[9]. Reducing diet-related greenhouse gas emissions will require shifting to healthy, nutritious diets and making unprecedented changes to food supply chain[9]. Rising temperatures and climate change will particularly impact on bioavailable crop land and natural resources in rural areas, disproportionately affecting those who already face food insecurity[1].

In July 2022, the UN General Assembly unanimously declared access to a clean, healthy and sustainable environment a universal human right[10]. The global health issue of ultra-processed foods threatens this human right across low-income and middle countries, and high-income countries. Global food production by multinational corporations has increased the availability of food energy to meet the demands of a growing population. However, this food energy is not evenly distributed, health promoting or nutritious. The result is regional under- and over-feeding, with global undernourishment, all while at the expense of the environment. The rapid rise in the sales of ultra-processed foods in densely populated middle-income countries means that the current burden of chronic disease and environmental impact from this type of food is just the tip of the melting iceberg[3].

World Food Day reminds us of the need to tackle global food insecurity in a sustainable manner, while mitigating the adverse impacts of ultra-processed foods. In order to meet the global need for access to and availability of healthy, nutritious food, we must simultaneously consider food production, nutrition and the environment[1]. U Ultra-processed foods are not essential, having only been introduced into our diets in the last generation, meaning that adverse impacts on health and the environment are avoidable. Nutritional and environmental strategies to date have largely failed to consider the role of ultra-processed foods, with industry pressures regarding reduced share profits of multinational corporations and fears of rising food costs. Action is required at the local, national and international level. Stakeholders across government, industry, non-governmental organisations, and academia must combine with the FAO to develop the essential multinational response to a global problem, working towards a paradigm shift in food production and consumption to address global food insecurity in a way that does not adversely impact upon human health and the environment.

Declarations

SJD is funded by a Medical Research Council grant (MR/N013867/1). RLB is funded by the National Institute for Health Research, Sir Jules Thorn Charitable Trust and Rosetrees Trust.

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