



EDITORIALS

Ultra-processed food and adverse health outcomes

Fresh evidence links popular processed foods with a range of health risks

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Over recent decades, the volume of industrially processed products in global food supplies has increased. This trend has coincided with a transition towards diets linked to a rising prevalence of obesity and non-communicable diseases in many countries.¹ Among food processing classification systems investigating this phenomenon the most prominent is NOVA, which groups foods into four categories according to the extent and purpose of industrial processing involved.²

One such category is ultra-processed foods, defined as “formulations of food substances often modified by chemical processes and then assembled into ready-to-consume hyper-palatable food and drink products using flavours, colours, emulsifiers and . . . other cosmetic additives.”³ These foods include savoury snacks, reconstituted meat products, preprepared frozen dishes, and soft drinks.

In the 10 years since Brazilian researchers coined the term ultra-processed foods,⁴ there has been a growing body of evidence associating consumption of such foods with poor diet quality, increased cardiovascular risk factors (eg, dyslipidaemia, hypertension), and adverse health outcomes such as obesity and metabolic syndrome.³

Two large European cohort studies in this week’s issue^{5,6} find positive associations between consumption of ultra-processed foods and cardiovascular disease⁵ and all cause mortality.⁶ The authors designed their studies well, performing various sensitivity and secondary analyses, adjusting for well known sociodemographic and anthropometric risk factors and for established markers of dietary quality. These findings follow a previous study⁷ and a linked editorial⁸ reporting an association between consumption of these foods and an increased risk of cancer.

The study by Srour and colleagues (doi:10.1136/bmj.l1451) reports an association between an absolute 10% increase in dietary ultra-processed food and significantly higher rates of overall cardiovascular disease, coronary heart disease, and cerebrovascular disease. Sensitivity analyses reveal further associations for specific groups of ultra-processed food, including beverages, fats and sauces, meats, sugary products, and salty snacks. Secondary analysis shows a statistically significant association between unprocessed or minimally processed foods and lower risks of all reported disease outcome

measures.⁵ The study by Rico-Campà and colleagues (doi:10.1136/bmj.l1949) finds a positive dose-response association between consumption of ultra-processed foods and all cause mortality. Participants in the highest quarter of consumption (>4 servings/day) had a 62% higher all cause mortality rate than those in the lowest quarter (<2 servings/day).⁶

These findings add to growing evidence of an association between ultra-processed food and adverse health outcomes that has important implications for dietary advice and food policies. The dietary advice is relatively straightforward: eat less ultra-processed food and more unprocessed or minimally processed food.

The findings also have implications for policy actions such as front of pack labelling, food taxation, and restrictions on food marketing, which require an evidence informed metric to determine the “healthiness” of individual food products. Currently, decisions about individual products are based on either dietary recommendations or nutrient profiling “scores,” both of which have limitations for this purpose.⁹

Dietary guideline recommendations are informed by studies that measure relations between dietary patterns (combinations of foods, such as a Mediterranean diet) and health outcomes. Nutrient profiling is typically based on the amounts of a limited number of single nutrients within a food. By contrast, the ultra-processed food categorisation is underpinned by evidence derived from food exposure studies and so can be directly translated into a metric for determining harmful or healthy foods for policy actions based simply on whether an individual food is or is not ultra-processed.

Critics of the ultra-processed food concept argue on three points: that the definition has varied over time, that in modern societies it is unrealistic to advise people to avoid ultra-processed foods, and that reformulating the nutrient composition of processed foods is a more effective way to reduce exposure to “risk” nutrients such as saturated fat.¹⁰

Although adjustments to the definition have occurred, these were often a necessary response to an evolving evidence base on food and health and a changing food supply. The view that it is better to reformulate ultra-processed foods than avoid them altogether underplays the complexity of potential harm: these

foods deliver risk nutrients into the body, displace nutritious foods from the diet, and as the products of industrial processing they can have peculiar physical structures or chemical compositions that are also risk factors for adverse health outcomes.¹¹

A recent randomised controlled trial comparing diets controlled for energy and nutrient composition showed it was the proportion of ultra-processed food rather than the amount of risk nutrients in the diets that caused weight gain.¹² Evidence is accumulating from mechanistic studies of plausible causal pathways by which the physical and chemical characteristics of these foods might cause harm, for example by changing the gut microbiome in ways that could disturb energy balance.¹³

Future research priorities include large observational analyses exploring associations between ultra-processed food and health harms in different populations around the world, prospective trials of these foods to establish causality (ethics permitting), and further mechanistic studies to help understand how harm occurs. Policy makers should shift their priorities away from food reformulation—which risks positioning ultra-processed food as a solution to dietary problems—towards a greater emphasis on promoting the availability, affordability, and accessibility of unprocessed or minimally processed foods.

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