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**Dr Priscila Machado** · 2 days ago**Reformulation – not a panacea for the harms of ultra-processed foods***Priscila Machado^{1,*}, Phillip Baker¹, Julie Woods¹, Mark Lawrence¹**1 Institute for Physical Activity and Nutrition, School of Exercise and Nutrition Sciences, Deakin University, Geelong 3220, Australia***Correspondence: p.machado@deakin.edu.au**Competing interests: None declared*

We read with interest the article by Tobias & Hall on the role of biological mechanisms to guide policy actions targeting ultra-processed foods (UPFs)[1]. The authors rightly place the increased supply of UPFs at the centre of the rise in obesity and chronic disease prevalence worldwide. The NOVA system has indeed been important in shifting the predominantly nutrient centric, reductionist understanding of nutrition science to a more holistic one, whereby foods are differentiated by degree and purpose of processing. This approach recognises that humans consume foods, which is more than a mix of nutrients, and that the potential health effects of a food involves the food matrix and other physical, biological and chemical properties of foods that are fundamentally altered by processing, and especially by ultra-processing[2, 3]. The type of processing not only alters the food nutrient profile, but also the presence of non-nutrient bioactive compounds, the bioavailability of nutrients, and the number and types of additives and contaminants in the food. It also influences its satiety potential by changing organoleptic properties (texture, flavour, colour) and the circumstances under which food is fed and consumed (when, where, and with whom)[4, 5].

Unfortunately, the framing of Tobias and Hall's article implies a binary policy approach for dealing with the consumption and harms of UPFs – one of either elimination or reformulation. This fails to acknowledge, and indeed they do not cite, existing nutrition policy frameworks that recommend a range of policy actions for protecting and promoting healthy diets[6]. They also incorrectly state the policy objective put forward by proponents of the NOVA system is simply one of UPF elimination. Rather, the policy objectives are to promote diverse, culturally-appropriate, safe and sustainable diets rich in un/minimally processed foods, and meals and dishes made using combinations of these foods with processed culinary ingredients and some processed foods. This is consistent with dietary guidelines in several countries that now adopt the NOVA system, including countries from Latin America, Europe, Southeast Asia and the Middle-East, as well as recommendations from national and international policy documents[3, 7].

With regards to UPFs specifically, the policy objectives are not simply to reformulate or eliminate, but to achieve minimal UPF feeding and consumption by halting the rise in consumption that is occurring in many countries in the Global South, and drawing-down consumption in countries where consumption is already high, as in the United States and many other countries of the Global North[8]. As analyses by the Lancet Obesity Commission reported, the global rise of UPFs is a reflection, and indeed an indicator of, the characteristics of today's industrial food systems. This includes agricultural practices that produce cheap commodity ingredients, deregulated business operating environments, and governance arrangements that give privileged access to food industry lobbyists[9]. Responding to this problem will require a holistic policy approach, one that is not only informed by an understanding of biological mechanisms, but also the economic, social, political and commercial determinants of UPF consumption[8].

Understanding the biological mechanisms that underpin the association between UPFs and health outcomes is crucial to infer causality, and the authors note a wide range of plausible mechanisms identified to date. Interestingly, few relate to the nutritional composition of these foods and yet, reformulation is recommended as a policy response to the harms associated with high UPF consumption. Reformulation, as currently practiced within the food industry, almost exclusively deals with nutrients, for instance, reducing sugar and sodium levels, or adding fibre extracts and synthetic micronutrients. In the reformulation of 'harmful' nutrients, little attention is given to the quality of the ingredients being substituted during reformulation – for example, sugar to artificial sweeteners, saturated fat to interesterified fats. The reduction in some nutrients has technological limits and thus the addition of further additives is required to maintain the hyper-palatability and cheapness of UPFs, and consequently to sustain high levels of consumption of these foods. Such nutrient-centric reformulation policies may serve to legitimise and even promote the consumption of UPFs via on pack claims and labelling schemes[10].

These types of nutrient changes ignore some of the fundamental outcomes of food ultra-processing. As a result of the processes and ingredients used in the manufacture of UPFs, some of these outcomes cannot be 'fixed' with current reformulation techniques. These include harmful by-products such as advanced glycation end products created by high-temperature extrusion, the loss of most non-nutrient health-protective bioactive compounds and the absence of interactions between food components that take place in whole foods, due to the inability to restore the food matrix [5]. Reformulation of UPFs is not only a limited response to the nature of the problem, and the determinants of unhealthy diets, but also risks causing harm by creating a health halo for products that inadvertently (or deliberately) promotes consumption[10]. What is needed is "wholefoods reformulation" [10] whereby food innovations result in a range of convenient and affordable new minimally processed or processed products, rather than reformulation of old products. Indeed, many non-ultra-processed versions of ready to eat products (e.g. salads, pasta, meals, non-flavoured cheese and yoghurt and fresh sandwiches) are already sold in supermarkets and restaurants globally.

Additionally, the authors argue that since UPFs already dominate diets in many countries, this makes their elimination not only utopian but likely to bring unintended consequences for public health, particularly related to affordability, convenience, and food insecurity. These arguments overlook the greater burden of obesity and chronic diseases in those who are more food insecure and for those whose food budgets are restricted. Convenience is understandably, highly valued by consumers but again, this cannot justify the continued preponderance of these foods in our diets.

UPFs are an emergent and dominant feature of today's industrial food systems, which as Tobias and Hall note, includes intensive and sophisticated forms of food marketing. Attenuating the harms associated with UPFs and achieving minimal levels of consumption of these foods will therefore require multiple and integrated policy actions that work across the food system as whole, including those aimed at transforming food supply chains and food environments.

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