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Identifying ultra-processed foods for policy

Alyssa J. Moran, Neha Khandpur & Christina A. Roberto

Defining non-ultra-processed foods, rather than ultra-processed foods, would better protect the public's health.

Health agencies around the world are taking steps to regulate ultra-processed foods — a group of products implicated in diet-related chronic diseases. To place limits on these products, legislators and regulators (policymakers) must be able to identify them. Recent efforts have focused on identifying ultra-processed foods by the presence of cosmetic additives, but this approach perpetuates a longstanding limitation of nutrition policies — manufacturers can simply reformulate their products, introducing new additives with similar structures and functions to avoid regulation. To address this problem, policymakers should instead create a definition of non-ultra-processed foods. This is an actionable approach that would improve regulatory efficiency, offer flexibility to regulate ultra-processed foods differentially by context, and better protect the public's health.

To address the global epidemic of diet-related diseases, health organizations are taking steps to limit the intake of ultra-processed foods. In a recent science advisory, the American Heart Association concluded that policies to limit the consumption of ultra-processed foods are warranted[1]. UNICEF identified ultra-processed foods as major contributors to childhood obesity and actively advocates for policies to limit their consumption[2]. The World Health Organization (WHO) stated that diets rich in ultra-processed foods are associated with an increased risk of several chronic diseases and is developing expert guidance on their consumption[3]. The US Food & Drug Administration (FDA) and the Department of Agriculture (USDA) have issued a formal request for information to develop a definition of ultra-processed foods for policy[4].

To regulate ultra-processed foods, policymakers need be able to identify them, but we lack scientific consensus on an actionable system of doing so. Thus far, efforts to identify ultra-processed foods for policy have been limited to variations on Nova — the framework for defining ultra-processed foods and identifying them for research. The Nova classification system uses the presence of cosmetic additives, such as colors, emulsifiers, flavor enhancers or thickeners, as a marker of ultra-processing[5–7]. Although this is a reliable method of identifying ultra-processed foods in the diet for research, it has many limitations when applied to the food system for the purpose of regulation (Table 1).

Table 1 | Advantages of using non-ultra-processed food categories to identify ultra-processed foods for regulation

Advantage	Description
1. More comprehensive	The list of cosmetic additive markers used to classify foods as ultra-processed for research is incomplete. The global food supply contains thousands of unique cosmetic additives, for which no regulatory body in the world maintains a complete list.
2. More responsive to an ever-changing food supply	Identifying ultra-processed foods based on known cosmetic additives incentivizes food companies to avoid regulation by creating new additives that are not on the list. Without ongoing regulatory review, many new products will be introduced to the food supply that meet the conceptual definition of 'ultra-processed' but cannot be identified for regulation.
3. More efficient for regulators	Many additives have several functions, and, according to Nova, the primary role of an additive in the product is needed to make an ultra-processed determination. Manufacturers are not required to disclose an additive's primary role, and asking regulators to conduct such an extensive review would be costly and burdensome.
4. More consistent with Nova	Nova groups foods into four categories that are often collapsed into two mutually exclusive categories, ultra-processed and non-ultra-processed, both of which contribute to health and disease. Defining both categories as mutually exclusive groups is consistent with the Nova conceptual framework and the public health literature.
5. Less logistically complex to implement	It is less resource-intensive and complex to identify the relatively few processing techniques and additives needed to ensure food safety than to identify the thousands of processing techniques and additives used to increase cosmetic appeal.
6. Shifts burden of proof to food manufacturers	Regulators would not need to prove each ingredient in their definition is ultra-processed. Instead, manufacturers would need to prove any new additives used in preservation improve food safety.
7. Lays the foundation for non-ultra-processed food policies	By defining both categories as mutually exclusive groups, there is a classification system available to limit ultra-processed foods and to promoting non-ultra-processed foods (for example, through a 'non-ultra-processed' food label, which the industry has already proposed).
8. Easier to regulate foods differentially by context	Creating category-specific definitions makes it easier to regulate foods differentially by context. A policy limiting ultra-processed foods in schools, for example, may not include bread or yogurt, which contribute important nutrients to children's diets.
9. Discourages reformulation of ultra-processed foods	By defining ultra-processed foods by what they are not, products containing new additives are considered ultra-processed by default. Thus, there is no incentive for food manufacturers to reformulate ultra-processed products to avoid regulation.
10. Encourages innovation and marketing of non-ultra-processed foods	Because reformulated ultra-processed foods would be subject to regulation, companies will be incentivized to create new, non-ultra-processed products. This will increase availability and diversity of non-ultra-processed products and may have benefits for small producers and manufacturers.

Table shows the advantages of identifying ultra-processed foods for policy based on category-specific definitions of non-ultra-processed foods.

The first limitation of using an additive-based approach to identify ultra-processed foods for policy is that the list of cosmetic additive markers is incomplete. The global food supply contains thousands of cosmetic additives, which are constantly evolving, and for which no regulatory body maintains a complete list. If ultra-processed foods were identified for regulation based on these markers, many existing products would be overlooked.

Second, identifying ultra-processed foods based on known cosmetic additives incentivizes food companies to avoid regulation by creating new additives that are not on the list. Without ongoing regulatory review, many new products will be introduced to the food supply that meet the conceptual definition of 'ultra-processed' but cannot be identified for regulation.

Third, identifying ultra-processed foods by the additives they contain is inefficient. Even if we had a complete and static list, many additives have several functions, and, according to the Nova system, the primary role of an additive is needed to make an ultra-processed determination. For example, xanthan gum may be used as a preservative in one product (making it non-ultra-processed), but as a thickener in another (making it ultra-processed). Manufacturers are not required to disclose the primary role of an additive in each product, and asking regulators to conduct such an extensive review would be costly and burdensome. Developing a system to identify non-ultra-processed foods would address these limitations.

Importantly, defining non-ultra-processed foods and using this definition to identify ultra-processed foods is an approach that is consistent with the Nova system. Nova categorizes all foods into four groups that are often further combined into two mutually exclusive categories: (1) non-ultra-processed and (2) ultra-processed[7,8] (Fig. 1). Non-ultra-processed foods include single-ingredient, unprocessed or minimally processed foods (such as cut fruit; Nova group 1), processed culinary ingredients used in cooking (such as salt; Nova group 2), and processed foods that contain a combination of foods from categories 1 and 2, including foods that have been fortified or preserved (such as canned fish; Nova group 3).

Ultra-processed foods are products that are industrially produced, made from little 'real food', and often modified by chemical processes using flavors, colors and other cosmetic additives (such as boxed macaroni and cheese; Nova group 4). It is both the increase in the intake of ultra-processed foods and the associated reduction in intake of non-ultra-processed foods that, together, increase disease risk[9]. Therefore, if we can identify non-ultra-processed foods for policy, we can assume all other products are ultra-processed by default. Because the Nova categories are mutually exclusive, in defining one category, we define the other.

How would such a classification system be designed? First, regulators could group foods into categories based on similarities in how they are produced and consumed. Categories could be adapted from existing classification systems, such as the USDA's What We Eat in America Food Categories, which include broad categories such as milk, plant-based dairy and mixed dishes, and narrower categories such as nachos, pizza and burgers.

Next, a definition of 'non-ultra-processed' could be created for each category by implementing the conceptual definition of non-ultra-processed foods as described in the Nova classification in combination with technical expertise on how the food category is produced and what it must contain to meet biological safety and hygiene regulations (such as certain preservatives). For example, in the yogurt category, a food may be considered non-ultra-processed if it contains milk, live cultures, and a list of non-ultra-processed additions as defined by Nova, such as fruit, nuts or nutritive sweeteners like honey. Yogurts that contain any other ingredient (for example, modified food starch, non-nutritive sweeteners or dextrose) would automatically be considered ultra-processed. By contrast, non-ultra-processed yogurt substitutes may contain lactase enzymes, as in this context, enzymes are needed to remove allergens rather than increase durability or cosmetic appeal.

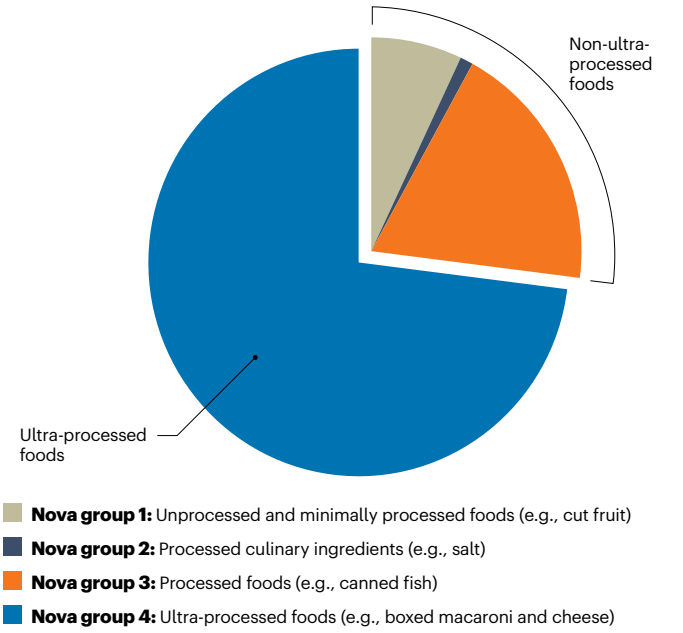

Fig. 1 | The Nova classification system. The Nova classification is a framework that categorizes foods into four groups (groups 1–4) that are often further combined into two mutually exclusive categories: (1) non-ultra-processed and (2) ultra-processed.

Table 2 gives examples, meant to be a proof of concept, in several categories. In practice, this classification system could be developed by experts in Nova, public health nutrition, food technology, and food science, much like previous food classification systems designed for front-of-package labeling policies, sweetened beverage taxes, and sodium limits for packaged and restaurant foods.

Our proposed approach also addresses concerns about certain non-ultra-processed foods that are not good for health when overconsumed, such as baked goods with excess sugar. Labeling these foods as 'non-ultra-processed' does not preclude governments from regulating them. They can still be subject to other nutrient-based regulatory requirements like standards for sodium and sugar in school meal programs.

Defining non-ultra-processed foods has many benefits for implementers. First, this approach is consistent with the Nova system and the existing evidence informed by it — diets that are higher in ultra-processed foods and lower in non-ultra-processed foods are associated with increased mortality and disease risk[9]. Second, it is logistically simpler to identify the relatively few processing techniques and additives needed to ensure food safety than to identify the thousands of processing techniques and additives used to increase cosmetic appeal.

Third, it shifts the burden of proof from our public health system to food manufacturers. Regulators would not need to prove that each

Table 2 | Examples of non-ultra-processed and ultra-processed foods

Category	Definition of category-specific non-ultra-processed foods	Definition of category-specific ultra-processed foods
Yogurt	Foods containing milk, live cultures, cane or beet sugar, molasses, maple syrup, honey, agave nectar, fruit, water, 100% juice, vitamins or minerals	Foods containing **anything other than** those identified in the non-ultra-processed category
Yogurt substitutes	Foods containing milk, plant-based milk (e.g., soy, almond, coconut milk), lactase enzymes, live cultures, cane or beet sugar, molasses, maple syrup, honey, agave nectar, fruit, water, 100% juice, vitamins or minerals	Foods containing **anything other than** those identified in the non-ultra-processed category
Bread	Foods containing unbleached flour (including enriched flour), grain/nut/seed meal, water, salt, vegetable oils crushed from seeds, nuts, or fruits, butter, herbs, spices, nuts, seeds, fruit, 100% juice, vegetables, cheese, yeast, sourdough starter, cane or beet sugar, molasses, maple syrup, honey, agave nectar, baking soda, baking powder, vinegar, eggs, milk, cracked wheat, or whole grains (e.g., oats, brown rice, whole grain wheat), vitamins or minerals	Foods containing **anything other than** those identified in the non-ultra-processed category

Example definitions created by identifying non-ultra-processed ingredients in each category, based on the Nova food classification system[7], using foods from the USDA Branded Foods Products Database, 2024. Some of the foods included in these definitions would have their own category definition for clarification (for example, milk, plant-based milk, fruit).

ingredient in their definition is ultra-processed — an impossible task in an ever-changing food supply. Instead, manufacturers would need to prove any new additives used in preservation are needed to improve food safety. Fourth, this definition could be used to identify products eligible for a 'non-ultra-processed' food label, rather than relying on a definition proposed by industry.

Fifth, this approach offers flexibility to implement policies in different settings. That is, a food product could be ultra-processed, but the category may be exempt from regulation in a particular context owing to competing health priorities. A policy to limit ultra-processed foods in schools, for example, may not include bread or yogurt, which contribute important nutrients, such as dietary fiber and calcium, to children's diets. If reducing the environmental impacts of food is the goal, one may choose to exempt plant-based dairy or meat. Most importantly, this system would encourage manufacturers to innovate and market new, non-ultra-processed alternatives.

By contrast, identifying ultra-processed foods based on the presence of known additives (for example, acesulfame potassium) or additive classes (such as non-nutritive sweeteners) is unlikely to result in a healthier food supply. Why? Because, if we define ultra-processed foods by known cosmetic additives, manufacturers can simply reformulate products using new additives not included in the list but serving the same function. In many countries, those ingredients can be added to the food supply without independent scientific review and can take decades to remove.

For instance, when, in 1976, the FDA banned Red Dye No. 2 owing to potential for carcinogenicity, food companies turned to Red Dye No. 3, which was only recently banned, nearly 50 years later, for the very same concerns. When governments passed policies that limit added sugars, companies replaced them with non-nutritive sweeteners, many of which remain in foods marketed to children despite safety concerns[10].

Creating new ingredients is easy because, in many countries, food companies can legally add new substances to food or even rename existing ingredients without notifying regulatory authorities[11]. To prevent those harmful practices, we need to define what makes a food non-ultra-processed so that foods with new additives will be deemed ultra-processed by default.

Another reason not to define ultra-processed foods by what they currently contain is that food companies can get their foods to comply with any standards we set for additives or ingredients while still getting us to overconsume mostly unhealthy foods. For instance, the Healthy, Hunger-Free Kids Act of 2010 authorized the USDA to set nutrition standards, such as limits on sodium, for school meals. This landmark policy improved child nutrition[12], but school food is no less packaged, hyper-palatable or biologically rewarding than it was before the policy. Instead of the fresh, healthy meals that were envisioned, the result was new, ultra-processed foods that meet the USDA nutrient thresholds, but are not terribly healthy.

Schools now serve pepperoni pizza made from a nutrient-enriched crust, reduced-fat and reduced-sodium pepperoni and cheese, and marinara sauce with just enough vegetables to meet the USDA standard. Other school foods include reduced-sodium 'mac & cheese' (boiled in a bag); reduced-sodium, whole-grain mozzarella sticks (baked in a bag); and a chili cheese hot dog, made from a whole-grain bun, low-sodium hot dog, and reduced-sodium and reduced-fat American cheese (baked in a bag). These foods may have less salt than before USDA's policy, but they are still ultra-processed junk foods, which have displaced nutritious whole foods in children's diets[13].

The problem of substituting one ingredient for another is not unique to foods — it has plagued the regulation of commercial products for decades. For instance, in 2009, the Tobacco Control Act granted the FDA authority to regulate tobacco products. Because FDA's oversight was limited to products derived from tobacco, cigarette manufacturers quickly created new products that included nicotine from other sources. In 2022, Congress amended the Act to include nicotine products, but by that time consumers had been exposed to these addictive products for over a decade. Similarly, when countries banned bisphenol A from baby bottles, companies replaced the chemical with bisphenol S and bisphenol F, which have similar molecular structures and endocrine-disrupting effects[14].

Clearly, identifying products subject to regulation according to their known ingredients makes it easy for manufacturers to game the system. This is because industrially produced products are constantly being renamed, reformulated, repackaged and redesigned. Any system of identifying these products based on their current constitution will cement into policy a definition that will be instantly outdated and incomplete. By contrast, the ingredients that comprise non-ultra-processed foods are relatively limited, static and easy to identify. Therefore, identifying ultra-processed foods by what they are not, would help to close a persistent policy loophole and avoid past mistakes.

Our regulatory and health agencies must capitalize on the political interest in the healthfulness of our food supply. We cannot waste this opportunity and adopt a definition of ultra-processed foods that keeps us on the same failing trajectory. Instead of encouraging manufacturers

to switch one ingredient for another, we need a definition that will incentivize the production and distribution of non-ultra-processed foods. We have a rare opportunity to ensure a healthier food supply for future generations – let's not squander it.

Alyssa J. Moran[1]✉, Neha Khandpur[2] & Christina A. Roberto[1]
[1]Department of Medical Ethics and Health Policy, Perelman School of Medicine at the University of Pennsylvania, Philadelphia, PA, USA. [2]Division of Human Nutrition and Health, Wageningen University, Wageningen, Netherlands.
✉e-mail: alyssa.moran1@pennmedicine.upenn.edu

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Competing interests

The authors declare no competing interests.