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Talking Points: (Don't) Let Them Eat Cake

The Opportunities and Risks of Classifying Food as Ultraprocessed

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Contents

Summary

Ultraprocessed food – foods (and beverages) that have undergone extensive processing – is a relatively new term we may hear a lot more of in the US, and not for positive reasons. On average, ultraprocessed foods account for over half of the daily calories consumed by adults in the US, Canada, and UK. If US consumers pick up the growing calls to cut down their consumption (regardless of the science and the flaws of classifying foods solely by their degree of processing), then it may become a serious threat to large sections of the packaged food industry. In the same way that cellular agriculture and precision fermentation have the possibility, however remote, to revolutionize how we produce and consume food, so too could classifying foods by their degree of processing transform the future of packaged food. Importantly, unlike many of the standard criticisms of processed foods, this is not just a challenge for large food and beverage companies. The term 'ultraprocessed food' potentially casts a wide net around many emerging companies too, even in on-trend categories such as better-for-you snacking and plant-based foods.

In this note, we introduce the concept and briefly discuss how we got here. We argue that the industry's response to date, that "everything is processed," is probably not a winning counterargument. However counterfactual, we also explore the opportunities that it represents for the food industry, mindful of the affordability challenge of manufacturing less processed food options. To repeat, what many in the industry are interpreting as the latest way to beat up on processed foods might also prove to be an opportunity. After all, in the future, we will almost certainly need more processed and packaged foods, not less. By viewing food through the lens of processing, the gauntlet thrown down to the industry is this: To what extent will processed foods have to differ from the ones we eat today to ensure they remain affordable but are not associated with poor health?

All Food Is Processed, but Some Food Is More Processed Than Others

That some people are critical of consuming processed foods is not new (Here, we use the term processed foods as shorthand to cover all industrially manufactured foods and beverages, such as packaged foods, ready meals at supermarkets, pre-prepared foods at restaurants, etc.). Consumers already know that indulging too often in packaged cakes, frozen pizzas, hot dogs, sugary sodas, salty snacks, and fast food might not be a winning strategy for attaining their health goals. However, until recently, the justification for avoiding or moderating their consumption has been centered around the ingredient list and calorie count. The finger-pointing is placed squarely

on a specific ingredient or nutrient: too much sugar, too much fat, or not enough protein, for example.

What has changed of late is a growing appreciation of consumers' overall dietary patterns (that is, the foods and beverages that people actually eat) rather than specific nutrients. This includes a greater interest in the degree of processing – the nature and extent of manufacturing – that goes into making processed foods and the potential impact of those multiple processing steps on health outcomes. Yes, ingredients and calories are still important, but so too is the degree of processing. That's where the term 'ultraprocessed foods' (UPFs) comes in. It is part of the NOVA food classification system created by the School of Public Health, University of São Paulo, Brazil in 2009. After gathering momentum in academic and medical circles for over a decade, the approach is now crossing over into the commercial food world. Basically, NOVA categorizes foods by their degree of processing, ranging from unprocessed to ultraprocessed, into four groups:

• **Group 1** – Whole foods such as fruits, vegetables, meat, milk, and nuts that are obtained directly from plants, animals, fungi, etc. or are minimally processed (e.g. drying, freezing, and fermentation).

• **Group 2** – Cooking ingredients, familiar to many homes, made from Group 1 foods such as butter, sugar, and olive oil.

• **Group 3** – Processed foods made from recipes of Group 1 and Group 2 foods such as bread, cheese, yogurt, canned meats, ham, and bacon.

• **Group 4** – Ultraprocessed foods. I struggled to find a neat definition. This is the best of the bunch: "Formulations of ingredients using sequences of processes that extract substances from foods and alter them with chemicals or additives in order to formulate the final product."

That is still a bit of a mouthful, but we all know these "industrial formulations of substances derived by foods" by more enticing names. They are all the industrially produced foods we love to eat and drink, including cookies, carbonated soft drinks, ice cream, frozen pizza, breakfast cereals, chicken nuggets, hot dogs, potato chips, sliced bread, candies, and cakes.

The important point here is that the first three groupings are all recognizable as modifications of Mother Nature's bounty using processing techniques embedded in food cultures for generations. In contrast, Group 4 is 'next level,' in the sense that it is both a relatively recent development and uses newer, more extensive chemical and physical processing techniques. The net result is that the final product contains very little identifiable Group 1 foods and instead is made with highly processed ingredients unfamiliar to home kitchens, such as protein isolates, modified starches, colorants, emulsifiers, flavors, and other additives. Group 4 foods often resemble many Group 3 or home-prepared foods but are differentiated by their multistep manufacturing processes and the (highly processed) ingredients used. So, for example, bread or cake can be either a Group 3 or Group 4 food depending upon how it is made.

How Did We Get Here?

Interestingly, the degree of processing appears to have increased over time. What are now considered Group 4 UPFs were once less processed Group 3 foods. "Why did this happen?" is a question my colleague, Cyrille Filott, asked me upon reading a first draft. It is a really interesting question and, I would say, worthy of a whole separate note that would include an exploration of the unintended consequences of agricultural policies promoting cheap food as well as the history of the commercialization of the food system. Nevertheless, it is worth making a few brief comments here.

Over time, the demand for processed foods has largely been driven by a number of megatrends, including rising disposable incomes and the growth in urbanization, coupled with consumers' relentless demand for convenience. We should also add that, for generations, consumers have

been sold on the benefits of processed foods, such as their affordability, their kitchen-liberating time-saving nature, a long shelf life that helps reduce waste, and, of course, their appealing taste. Food companies have in turn responded by making foods and beverages that consumers want to buy. This includes manufacturing a stream of both familiar and innovative products, often with novel processing technologies, that stimulate demand, create new food categories, broaden existing ones, and open up new routes to the consumer in the process. While attempting to satisfy consumer demand for convenience, affordability, shelf life, and deliciousness, food companies, which are not public health agencies, are also expected by their shareholders to maintain margins and turn a profit as they battle it out in a highly competitive market for the consumer's food dollar. This has included incrementally taking the cost out of food manufacturing through more efficient processes and cheaper ingredients. To say that food has become, over time, a 'least cost' formulation is a little harsh, but the cost equation is obviously a critical factor. And lower-cost, highly processed foods that excite the consumer are the natural culmination of these trends.

Over the past two to three decades, ultraprocessed foods have become an important component of the retail and foodservice landscape across the world and the dominant source of calories in some countries. In the US, Canada, and UK, for example, these foods now account for over half of an adult's daily calories (primarily from packaged bread, cakes, cookies, salty snacks, ready meals, and sodas.) Within Europe, studies have estimated the average availability of calories from UPFs at about 25% (from 10% in Portugal and 13% in Italy to 46% in Germany.) In Latin American countries such as Brazil, Chile, and Mexico, estimates range from one-fifth to one-third of total daily calories. Their importance to our diet, as a major contributor to calories, is why so much more attention is being paid to them. Since the NOVA classification emerged, there have been hundreds of observational studies indicating a troubling link: Greater consumption of ultraprocessed foods is associated with an increased likelihood of poor health outcomes. It is a who's who of chronic disorders and diseases, including weight gain, type-2 diabetes, and cardiovascular diseases, as well as mental health impacts. I have not heard of one study reporting an association with positive health outcomes.

One investigation by Dr. Kevin Hall and his colleagues at the National Institutes of Health (NIH) in the US has gathered a lot of attention, as it was the first attempt to test the causality of this association. This small study found that a diet based on UPFs, even when matched for macronutrients (carbohydrates, fats, etc.) with a diet containing no UPFs, led to participants eating about 500 calories more a day and consequently gaining body fat. Simply put, even when you take the macronutrient ingredients out of the equation, there is still 'something' about UPFs that caused people to overeat and gain weight. That's as good a place as any to end the introduction to this evolving story and consider five consequences for the food industry.

1) Will We Be Hearing More About UPFs?

If Google Trends is any guide to consumer behavior, it appears the term UPFs has barely registered with the general public in the US. It may well remain like that, just something academics and medical practitioners talk about. However, there are a few signs to suggest it might enter the public's food lexicon. First, the NOVA classification system and language of UPFs has been adopted in other parts of the world. It has already been embraced by public health agencies in Brazil, Canada, France, and Israel, as well as the FAO's guiding principles for a healthy diet. Advice to limit the consumption of UPFs is also expected to be part of the forthcoming update to the Nordic Nutrition Recommendations. Closer to home, the American Heart Association recently revised its own heart-healthy dietary guidelines, advising the public to "choose minimally processed foods instead of ultraprocessed ones." It is not unreasonable to assume other organizations will follow suit. Equally important, the USDA has, for the first time, included the relationship of consuming UPFs and weight gain as one of the possible areas of research for the panel of experts that advise on the next Dietary Guidelines for Americans,

expected in 2026. Even the draft proposals by the FDA (in the US, food is regulated by a number of agencies) on the long-awaited "healthy" food claim might pique consumer curiosity on the role of processing. (Right now, consumers have access to very little information on a food product's degree of processing.) The FDA is floating the idea that in order to use a "healthy" claim a food product must contain a meaningful amount of food from at least one of the recommended food groups (fruits, vegetables, etc.) as well as limit certain ingredients, such as added sugars, salt, and fats. At face value, it looks like many products that fall under the ultraprocessed label will be excluded. Consumers may well wonder why their go-to, better-for-you snack bar or energy drink failed to pass the test.

2) No One Is Immune; Everyone Is Impacted

Conventional criticisms about packaged foods, such as problematic ingredients and calorie count, have generally hit the larger food companies the hardest. One of the differentiating things about filtering foods by their degree of processing is how it transcends the usual ways in which we classify foods. NOVA is agnostic about emerging versus established brands, better-for-you versus indulgent snacks, or even diet versus regular products. So, many food products, even in on-trend health & wellness categories, run the risk of being considered ultraprocessed. This is because, despite (or arguably because of) their reduced sugar, high protein, or "better-for-you" image, many emerging brands, from snack bars to puffed chickpea snacks to soft drinks, are also highly processed. And don't forget about all those plant-based meats and dairy products. They are often highly processed too. (I would not be the first to point out that many plant-based foods do not in fact contain any plants.) In short, this is not just a 'Big Food' issue; it has repercussions for many food and beverage companies whether they supply processed foods to supermarkets or restaurants.

3) Will the Consumer Wait for the Science?

The clever minds at the NIH and other medical institutions are now trying to figure out what exactly are the biological mechanisms, if any, that explain the association between consuming UPFs and negative health effects. This is going to take some time, as there are a lot of hypotheses to test. The literature and media are already full of speculation. This ranges from the simple, "There is nothing wrong with UPFs. The problem is we eat too many, and they displace the Group 1-3 foods we should all be eating more of," to the conspiratorial "What are 'they' putting into our food?" and everything in between. For example, is it something:

• **Lost?** To what extent do the multiprocessing steps strip out or degrade vital nutrients such as dietary fiber or all the underappreciated and unlabeled micronutrients such as phytochemicals, ultimately lowering the nutritional profile of the final product?

• **Added?** Conversely, what processing steps necessitate the addition of non-nutritional ingredients such as flavors, colorants, and emulsifiers?

• **Transformed?** What are the processing techniques that change the structure of the food and make UPFs so energy-dense and palatable?

• **Created?** What is the health impact of the compounds that are produced during processing, such as transfats?

• **Impacted?** Does the degree of processing influence the diversity and functionality of our microbiome?

• **Unrelated?** Are there any confounding factors that are throwing up false associations?

In an ideal world, we would all suspend judgement until the evidence comes back in a few years' time (at best), including when others have replicated the Hall study. Only then can the experts make appropriate recommendations on the role UPFs should play in our diets (from avoiding to

using sparingly to reformulating to the all-clear.) And there's the rub. How likely is it that consumers will wait to make up their minds? In the age of social media, where everyone can instantly hold forth and speculate, and no one can control the narrative, we worry consumers (or at least, the influential ones) could easily form an unscientific opinion of processed foods faster than you can say, "Non-GMO Project." Experience suggests that once a trend has gained momentum with consumers, it becomes very hard for the food industry to push back. Recall The Non-GMO Project, a non-profit certification scheme that spread like wildfire through the US natural food industry, promoting non-GMO foods and pressuring food companies to reformulate their products marketed as 'natural' to take out genetically derived food ingredients. Ditto for gluten-free or high fructose corn syrup-containing products and other consumer trends where the science often takes a back seat. Could we see a repeat of that for UPFs, in that a 'non-UPF' food label becomes synonymous with how consumers choose to define healthy?

In many ways, the consumer is already primed to view UPFs in a negative light, as it is consistent with many ongoing narratives and food trends, including the demand for fewer ingredients, 'clean labels,' and 'clean-eating' diets (the most popular dietary eating pattern in the US, according to the International Food Information Council). It is even consistent with the rather woolly advice by some commentators for consumers to avoid foods containing too many ingredients or ingredients that they cannot pronounce or "sound scary." It would be a curious turn of events for these guys to be proven right but for different reasons.

4) Making the Case for Processing

The last section painted a rather unwelcome scenario for the food industry, but it is just conjecture. It is not inevitable. In the US, there is a window of opportunity to help shape the narrative, such as reminding consumers of the noncontentious benefits of processing (from improving food security, improving taste and diets, food safety, reducing waste, convenience, and of course, affordability), as well as some very valid criticisms of NOVA. Of course, the food industry has a keen interest in trying to determine and conduct research into what is the issue, if any, with UPFs. But defending packaged foods with arguments such as "Everything is processed," which I heard repeatedly during my research, is probably not a winning argument. It misses the point of what NOVA and other food processing classification systems reveal. Neither the architects of NOVA nor anyone else for that matter is saying no to processing. To quote one of the leading architects behind NOVA, Carlos Augusto Monteiro, "Food processing in itself is not the issue."[1] This is especially true for the processing techniques of drying, freezing, fermenting, etc., that humans have been doing for millennia. Turning to NOVA, critics highlight a number of flaws and hone in on three issues:

• **It is undefined.** There appears to be no agreed-upon definition for ultraprocessed foods, so the examples of foods within each grouping vary between study; some healthy foods may exist within one UPF category in one study and a different category in another.

• **It tells us nothing new.** To many, UPFs just sound like another way to categorize foods of poor nutrient quality that already come under a lot of criticism using conventional nutritional metrics, because they are typically high in sugar, salt, and fat. Certainly, highly processed foods such as margarine have existed for decades. We just never called them UPFs before.

• **It is impractical and unhelpful.** Arguably, the biggest criticism of the approach (referenced in the title to this note) is its impracticality. How exactly can the general public follow through on the advice to limit the consumption of UPFs? As we have already noted, in the US, an estimated 70% of packaged foods would be considered UPFs, based on the NOVA classification. And typically,

[1] Monteiro, C.A., Cannon, G., Lawrence, M., Costa Louzada, M.L. and Pereira Machado, P. 2019. Ultra-processed foods, diet quality, and health using the NOVA classification system. Rome, FAO. Page 3.

UPFs are half the cost of minimally processed. For most consumers, the implication of discouraging the consumption of the more affordable UPFs essentially translates into avoiding half to two-thirds of the supermarket shelves. This might be relatively easy for the more affluent consumer, but without inexpensive alternatives to UPFs that look and taste familiar, not to mention the time and culinary skills to make meals out of less processed foods, it sounds like an impossibly tall order for most people, especially during a cost-of-living crisis.

5) Look to the Opportunities

While it is important to help shape the narrative around processed foods, companies must also focus on the opportunities afforded by the greater consumer interest in food processing that NOVA is likely to generate. There is too much at stake for food companies not to play a role and be a part of any potential solution. Besides, if consumers do move against highly processed foods ahead of the science, companies will have to follow suit. With rising GDP per capita, greater urbanization, and an insatiable consumer appetite for inexpensive, convenient forms of food, the world will need more processed foods, not less, in the future. The gauntlet thrown down by NOVA is: To what extent will processed foods need to be of a different kind or different form to ensure they remain affordable and relevant to consumers but are not associated with poor health outcomes? Five thoughts come to mind:

- **Down on the farm** – Let's start with the positive. The NOVA classification system is good news for large sections of the food, agriculture, and livestock industries for the obvious reason that most farm production leaves the farm in a very natural and unprocessed form – all those fruits, vegetables, fresh meat, and dairy products. The same is equally true for food manufacturers producing foods made from recipes using Group 1 and Group 2 foods and familiar processing techniques. If ultraprocessed foods become an issue with consumers, then these industries have a new marketing opportunity to help win over the consumer.
- **Ongoing company initiatives** – For their part, many food companies can already point to ongoing initiatives around product reformulation. Food companies have been responding to the consumer desire for clean labels, reducing the number of ingredients, taking out the artificial, etc., for some time. Recent comments by food companies suggest this trend is likely to continue. In September, Juan Luciano, the CEO of ADM, noted while discussing significant opportunities for the company that "consumers' desire to focus on their nutrition as a way to improve their health and well-being… is impacting every aspect of our company." Similarly, at a recent investor event, Jim Zallie, CEO of Ingredion, talked about the "clean and simple" consumer trend, where "consumers today want easy-to-understand labels and clean and simple ingredients in their products." For Grupo Bimbo, their first sustainability pillar is nutritional diversity, where future foods are "made with clean label recipes… or with inputs of vegetable origin, such as plants, whole grains or similar." Building upon this foundation will address the potential challenges of UPFs and may be sufficient to eliminate their deleterious effects. In the same way that companies have added new lines for better-for-you snacks or plant-based options, surely minimally processed can just be that new marketing opportunity?
- **Agtech and food tech solutions** – Besides reformulation, greater attention to food processing by consumers could spur innovation in seed and food-processing technology. Take dietary fiber as an example. Adding fiber as an ingredient when reformulating foods is a relatively simple fortification process, but retaining fiber during food processing requires greater innovation. Similarly, seed technology solutions that increase the fiber content of the raw ingredient will reduce the need for some of the existing processing steps currently used in food manufacturing. For example, in the case of protein, the St. Louis-based food tech company Benson Hill produces a high-protein soybean flour as a minimally processed alternative to other highly processed ingredients, such as soy protein isolate. Equinom from Israel has developed a non-GMO yellow pea high in protein that requires little processing.

- **Redesign and reverse engineering** – When it comes to food processing, the lasting significance of the NOVA system may be to remind the industry of the possible dangers of too much of a good thing. We have already mentioned how in the past, many products that are now considered Group 4 UPFs were once less processed Group 3 foods. Perhaps the real opportunity here is for food companies to reflect upon the drivers that created ultraprocessed foods, such as the push from market forces to lower costs in order to remain price-competitive and consumers' need for convenience, taste, and affordability. For food technologists, this may translate into figuring out how to reverse engineer and redesign their food production processes by rediscovering or revisiting less damaging or less destructive processing techniques (freezing, fermentation, high-pressure processing, and cutting-edge solutions and methods that keep the integrity of the whole food intact) – all while maintaining the positives of food processing, like taste and affordability, as consumers will not want to pay more for these products or spend more time in the kitchen. There are lots of smart companies out there already working on related issues. Take True Essence Foods, a food technology company restoring flavor to shelf-stable foods, or Brightseed, which uses artificial intelligence to deepen our understanding of the millions of chemical compounds that plants produce.
- **Nutrition profiling systems** – In some ways, NOVA might prove to be the tip of the iceberg when it comes to how we classify foods in the future. NOVA represents just one, or a component of, a growing number of so-called nutrient profiling systems (NPS) to determine the healthfulness of foods. For consumers, the NPS, ideally as an app, could be used to guide food choices at the point of purchase or consumption. For the food industry, NPS could help to encourage reformulation, new product development, even investment choices. Nutrition profiling systems range in sophistication from those that focus on just a few macronutrients to the more advanced ones such as Nutri-Score, Healthy Eating Index, Nutrient Rich Foods Index, GroceryDB, Health Star Rating, and Food Compass, which incorporate a multitude of attributes. For example, Food Compass from Tufts University scores all foods and beverages against over 50 attributes (NOVA is included within the algorithm) to derive a final Food Compass score ranging from 1 (least healthy) to 100 (most healthy). Similarly, GroceryDB uses a machine learning-based classifier to predict and help consumers understand the degree of processing of popular packaged foods and allow consumers to choose less processed alternatives. Food retailers and companies have already started to adopt these profiling systems. For example, Nestlé recently announced that it will incorporate the Health Star Rating in future annual reports, as well as use front-of-pack Nutri-Score labels in some markets, to increase the transparency of the nutritional profile of its food and beverage portfolio.

Imprint

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