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Commentary; The big issue is ultra-processing

What are ultra-processed products



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Introduction



Editor's note

This commentary continues our 'the big issue' series begun in *WN* in late 2010, on food processing, and its impact on dietary patterns, food culture, public health, public policies, society, and the environment. The general thesis of the series, originated within the centre for epidemiological studies in health and nutrition in the school of public health at the University of São Paulo, Brazil, is as follows. 'The most important factor now, when considering food, nutrition and public health, is not nutrients, nor foods, so much as what is done to foodstuffs and the nutrients originally contained in them, before they are purchased and consumed'. The next in this 'the big issue' series will be published in our August issue. .

The first commentary in this series published in *WN* in late 2010 (1) sets out the beginnings of a new general theory about the nature of public health nutrition. A key point is: 'The big issue is food processing – or, to be more precise, the nature, extent and purpose of processing, and what happens to food and to us as a result of processing'. This initial and substantial *WN* commentary, which has now been accessed more than 100,000 times, was developed from a shorter piece published the previous year in *Public Health Nutrition* (2). Since then, a series of commentaries and papers have been published in *WN*, in other journals, and in booklet form. These have been authored by Carlos Monteiro, or by both of us, or else have been co-authored or authored by colleagues at the University of São Paulo, or by others (3-10). We have also made presentations on the topic at international conferences and other meetings in different parts of the world.

Classification

In the first and also later commentaries and papers a new classification of foodstuffs and edible products is presented. This is designed to supersede and replace all previous classifications based on food groups or on nutrients, from which official and other dietary guidelines are derived. In this respect the thesis is revolutionary. To use a common term, it is designed to mark a shift of paradigm.

Box 1

Ultra-processing

Adapted from (1). Ultra-processed products, group 3, combine the already processed group 2 ingredients, such as oils, fats, sugars, salt, flours, starches, remnants of meat, with some (often only a small or even minuscule amount) of unprocessed or minimally processed group 1 foods. Sometimes no group 1 foods are included, although they may be imitated. Specific processes include baking, battering, frying, deep frying, curing, smoking, pickling, canning, use of preservatives and cosmetic additives, addition of synthetic vitamins and minerals, and sophisticated types of packaging.

The purpose of type 3 food processing is the creation of durable, accessible, convenient, attractive, ready-to-eat or ready-to-heat products. Such ultra-processed products are formulated to reduce microbial deterioration ('long shelf life'), to be transportable for long distances, to be extremely palatable ('high organoleptic quality') and often to be habit-forming. Typically they are designed to be consumed anywhere – in fast-food establishments, at home in place of domestically prepared and cooked food, and while watching television, at a desk or elsewhere at work, in the street, and while driving.

Ultra-processed products are themselves of two types. One includes soft drinks, and ready-to-eat savoury or sweet snacks, or products liable to be consumed as such. The other includes pre-prepared ready-to-heat products designed to replace dishes and meals in the home or on site in catering establishments. Their processing is undertaken by food manufacturers, or by caterers such as those that supply burger and pizza outlets, or food retailers such as bakeries.

From the public health point of view, ultra-processed foods are problematic in two ways. First, their principal ingredients (oils, solid fats, sugars, salt, flours, starches) make them excessive in total fat, saturated or *trans*-fats, sugar and sodium, and short of micronutrients and other bioactive compounds, and of dietary fibre. Taken together this increases the risk of various serious diseases. Second, their high energy density, hyper-palatability, their marketing in large and super-sizes, and aggressive and sophisticated advertising, all undermine the normal processes of appetite control, cause over-consumption, and therefore cause obesity, and diseases associated with obesity.

Ultra-processed products are usually not consumed together with unprocessed and minimally processed foods. They are designed to be ready-to-eat or ready-to-heat, and are often consumed alone or in combination with other ultra-processed products, such as savoury snacks with soft drinks, and bread with burgers. Any accompanying fresh food, such as lettuce within a burger, is usually little more than trimming or decoration, added to give an illusion of wholesomeness.

The new classification takes into account the successive and massive changes in food technology and food systems in the last 200 or so years. These began with industrialisation. They then became much more pervasive in high-income countries with the rise of mass manufacturers of fast food and soft drinks, notably as from the second half of the last century. These changes have accelerated in particular since the 1980s, as a result of the privatisation of public institutions and goods, economic globalisation, and deregulation of what have become vast transnational food and drink product corporations. In this period, in which we all live now, obesity and other chronic diseases have become uncontrolled global explosive epidemics.

Dogma and disease

We state that the chief systemic cause of these pandemics, are the policies and practices of the transnational manufacturers of ultra-processed products. We also state that in turn, the cause of these policies and practices are what still remains the application of the prevailing political and economic ideology of the most powerful nation states and the international institutions they dominate. Evidence of the disastrous effects of this dogma is now overwhelming, from any sensible point of view. Within this broad view, the purpose of this and associated commentaries and papers is – we believe for the first time – to provide a tool for all relevant professionals and policy-makers to understand what is going on, and to prepare rational policies as the basis for effective actions.

Current conventional classifications of diets in terms of food groups and nutrients, incrementally revised since the first half of the last century, do not explain what has now become a catastrophic global public health crisis. Curiously, recent publications by lay writers (11-13) do a better job of accounting for what is now going on, and in our own work we have learned much from such authors. In our view, our classification is the first to be published in the specialist literature that makes sense of modern food systems. We have been encouraged in this belief by comments (some critical) and support from many colleagues.

As readers will already know, our classification is basically very simple. It separates fresh or minimally processed foods (group 1), from culinary ingredients (group 2) and from ultra-processed products (group 3). Box 1 above, adapted from (2), gives a summary account of what are ultra-processed products.

Discussion

Box 2

Ultra-processed products

Adapted from 5. Ultra-processed products include the following. Some have been part of traditional long-established dietary patterns. Most are products of industrialised food systems, and are now produced and consumed throughout the world in much greater quantity than was the case even a generation ago.

Breads, biscuits (cookies), cakes and pastries; ice cream; jams (preserves); fruits canned in syrup; chocolates, confectionery (candies), cereal bars, breakfast cereals with added sugar; chips (French fries), crisps (chips); sauces; a vast range of savoury and sweet snack products; cheeses; sugared fruit and milk drinks and sugared and 'no-cal' cola, and other soft drinks; frozen pasta and pizza dishes; pre-prepared ready-to-heat dishes and meals containing meat, poultry, fish, vegetable and other 'recipe' dishes; processed meats including nuggets, hot dogs, sausages, burgers, fish sticks; canned or dehydrated soups, stews and pot noodle; salted, pickled, smoked or cured meat and fish; vegetables bottled or canned in brine, fish canned in oil; infant formulas, follow-on milks, baby food.

As well as explaining the nature of ultra-processed products in general, it should be helpful to give an example. Here is one, courtesy of the US photographer Dwight Eschliman, and the author Steve Ettlinger who has written a whole book just on one product – the Twinkie (14). Twinkies are described by the trade as 'golden sponge cakes with creamy filling'. That's one way of putting it...

The Twinkie

The Twinkie is not a typical ultra-processed product for a number of reasons. First, its consumption, at 36 million items a year in the US, is relatively low. Second, unlike leading ultra-processed products, it is well-known only in its country of origin. Third, maybe partly for this reason, its manufacturer, Hostess Brands, formerly Interstate Bakeries, whose companies have included the Ambrosia Cake Company, the Butter Cream Baking Company, the Kingston Cake Bakery, Cobb's Sunlit Bakery, Schall Tasty Baking Company, the Sweetheart Bread Company, Dolly Madison Cakes, and Mrs Cubbison's Foods, formerly of Kansas City, Missouri, now of Irving, Texas, although having a revenue of over \$US 2.5 billion in 2008, is not thriving. Fourth, Dan White, who was convicted in 1979 of the manslaughter of San Francisco mayor George Moscone and official Harvey Milk, had his verdict reduced from murder on the grounds of 'diminished capacity' of which consumption of sugary junk food was a symptom, which became famous in legal circles as 'the Twinkie defence'.



Here is what is in a Twinkie. This ultra-processed product is untypical in that it is a sort of cake consumed commonly only in the US. But the point is made

Their ingredients, when last listed, are: ‘Enriched bleached wheat flour [flour, reduced iron, B vitamins (niacin, thiamine mononitrate (B1), riboflavin (B2), folic acid)], corn syrup, sugar, high fructose corn syrup, water, partially hydrogenated vegetable and/or animal shortening (soybean, cottonseed and/or canola oil, beef fat), whole eggs, dextrose. contains 2% or less of: modified corn starch, glucose, leavenings (sodium acid pyrophosphate, baking soda, monocalcium phosphate), sweet dairy whey, soy protein isolate, calcium and sodium caseinate, salt, mono and diglycerides, polysorbate 60, soy lecithin, soy flour, cornstarch, cellulose gum, sodium stearoyl lactylate, natural and artificial flavors, sorbic acid, yellow 5, red 40’.

These are what you see in the pictures, plus the other ingredients listed at the right hand side. There are in fact an unknown number more ingredients in the product, because manufacturers are exempted from listing all the individual flavours used in their products.

The meaning of ‘ultra-processing’

Now we turn to the question: Why the terms ‘ultra-processing’ and ‘ultra-processed products’? Colleagues have asked us, what’s wrong with the terms ‘processed foods’, or ‘highly processed foods’, or even ‘junk food’? Or else, ‘snack food’, or ‘fast food’, or ‘convenience food’?

Most of these terms do relate to our topic, but none are satisfactory. For a start, industry representatives quite rightly say that almost all food consumed at least in industrialised settings is processed in a normal sense of the word, and also that many processes preserve food or make it safe. A common example is cooling, freezing and refrigeration, which make perishable vegetables and fruits available all year round. So the term 'processed food' is useless and actually counter-productive.

'Junk food' is a term coined by the Washington-based leading civil society organisation, the Centre for Science in the Public Interest. It's effective as a headline-grabber, but is not a term that works in a serious scientific or policy-making context. Privately many transnational manufacturers say that 'junk' is what the other guy makes, whereas...

The trouble with 'snack', 'fast' or 'convenience food', is that while it may be true that 'we all know' at least roughly what these terms are referring to, fresh fruit is also convenient, ready-to-eat, in this sense 'fast', and is often eaten as a snack. It is understandable that industry people make this point, and while making it, insinuate that their products are – well, sort-of like fruit. If you look at the way transnationals project their products on their websites and advertising, you will quite often see an apple or some other fresh fruit in the picture. Now you know why.

So what about 'highly processed'?

So this leaves 'highly processed'. There are a number of good reasons not to use this term. First, it also is vague, and even if it was made the subject of precise definition, people would go on using it loosely. Second, while many ultra-processed products are indeed intensely processed, the term refers chiefly to the nature and purpose of processing. Also and conversely, many culinary ingredients, in our group 2, would often be reasonably identified as 'highly processed', but we contend that as normally used in preparation of dishes and meals with reasonable care, ingredients are not harmful to human health.

Third, it is only precisely defined terms that can be used as a basis for legislation. Most independent commentators now agree that unhealthy foods should be regulated by statute, and that in particular, advertising and marketing of such foods to children should be restricted or prohibited. In order to do this, the products to be regulated have to be unambiguously defined. Terms like 'highly processed food' are unclear. 'Ultra-processed products' are clearly defined (2,4,5) and can be further defined with even more precision. This does not preclude regulation of specific products such as sugared soft drinks or breakfast cereals with more than certain levels of sugar content.

By contrast, ultra-processing is used to make products from combinations of ingredients extracted from whole foods, usually with little or even no whole foods.

Also typically, series of processes are used, in the creation of the ingredients and also in the creation of the products, which also usually contain some or many preservatives and cosmetic additives. They are formulated to be hyper-palatable, of long duration, and are usually packaged ready to consume. They are very profitable and aggressively marketed. They are the end product of a chain of processes, often as evident from their ingredients lists. There is a clear correlation between the rise in production and consumption of ultra-processed products, and obesity.

Traditional nutrition thinking defines unhealthy foods in terms of their nutrient content. Thus for instance we have high fatty foods, high sugary foods. This is not much use for several reasons. First, it is important to consider the whole nutrient profile. Meat is high in saturated fat, but it is also rich in essential amino acids and micronutrients which may be lacking in the whole diet. Second, it is important to consider other foods that are usually consumed with the products in question. Third, culinary ingredients are not in themselves palatable. Thus, oils of any type are pure dietary fat, but they are mostly used in the preparation of dishes and meals together with whole foods such as cereals, legumes, vegetables and other nutritious foods.

The big picture

Fourth, in a context of a pandemic of obesity, factors such as energy density, hyper-palatability, super-size servings, are all at least as important as nutrient profile. In referring to manufacture and manufacturers, the term ‘ultra-processing’ rightly points to dimensions of nutrition that are wider than the biological dimension to which current discourse is still so often confined. While of course nutritional factors are important, the driving forces are much broader. They are social, economic, political and environmental in nature, as has now been acknowledged, a week before this commentary was completed, by the WHO World Health Assembly (15).

These broad drivers, which clearly relate to economic globalisation in various ways, have little application to meat, milk, other dairy produce, etc, except inasmuch as these have been and are overproduced and dumped – which indeed they are. But ultra-processing, which combined with deregulation and the type of ‘free trade’ that systematically favours the most rich and powerful countries and businesses, underpins the spectacular emergence and growth of transnational corporations.

It is ultra-processed products that drive the profits of transnational food corporations. This is because of their characteristics. It is idle to suppose that the transnationals could make as much profit, or be able to penetrate so deeply into the global South, if they shifted their priorities to fresh or minimally processed foods. There are other and broader issues here also, involving the undermining of meals, the family meal table, the family itself, long established food systems and culture, local economies, which we discuss elsewhere (10).

Ultra-processing: seven points

Here are seven basic points about ultra-processing and ultra-processed products.

1 *Confections of ingredients*

Ultra-processed products are a specific type of processed product. As consumed, practically all foods are processed in some way, and many now are highly or heavily processed in any normal sense of these words. The defining characteristic of ultra-processed products is that they characteristically are confections of ingredients, and usually also chemical preservatives and also often cosmetic additives, with little, very little or even no fresh food in them. Typical examples are packaged and branded snack products and soft drinks.

2 *Varying quality*

Most categories of ultra-processed products include a range of quality. From the nutritional and other points of view, soft drinks are soft drinks. But bread, as a clear example, may be of relatively execrable or admirable quality. There is an obvious contrast between wrapped 'plastic' bread that is only palatable when spread or stuffed with what are often fatty items, and fresh bread made with wholegrains that is delicious eaten by itself or as an accompaniment to meals. The same sort of point can be made with other products. But usually there is no clear dividing line within categories, and we maintain that it is best to keep the classification simple. A detailed guide will make necessary qualitative distinctions. See also point 6 below.

3 *Additives as adulterants*

Unlike many processed foods, ultra-processed products are characteristically not modified versions of real fresh or minimally processed foods. Typically, they are fabrications. They are formulated in all sorts of ways meant to make the products alluring. Their intense sensory appeal floods the mechanisms that normally regulate appetite control, and thus what and how much is consumed. In a real sense many ultra-processed products are 'fake foods' or as one commentator puts it 'edible food-like substances' (13). Preservatives aside, the main purpose of chemical additives in these products is to make them look, smell, feel and taste like real food. The issue of toxicity of cosmetic and other additives is probably far less important than their use as adulterants.

4 *Usually but not always industrial products*

Ultra-processing developed in two main stages. The first was as an aspect of the industrial revolution, as a result of which products like cakes, biscuits, processed meats and soft drinks became mass-manufactured. The second has been a consequence of economic globalisation, privatisation, and deregulation, as a result of which vast transnational corporations have massively increased worldwide production and distribution of what is now a colossal range of packaged and branded ultra-processed products. But some such products predate industrialisation, while now being almost entirely mass-manufactured. An example is bread made with wheat flour as its main single ingredient. Processed meats are another example.

5 *The central place of transnational corporations*

The main products of transnational food and drink manufacturers are ultra-processed. This is because they are very profitable. The main ingredients of most leading products are extremely cheap. They are formulated to have a long 'shelf-life'. Many are advertised and marketed relentlessly all over the world. They are also labelled in ways designed to induce 'brand loyalty' often across whole ranges of products designed to be consumed throughout life. Some individual transnational corporations, also known as Big Food or Big Drink or more precisely Big Snack, have annual revenues the size of the gross national products of small or even medium-size countries. They can and do undermine and displace traditional long-established food systems and dietary patterns, and as a result push population consumption of their products up from a relatively small percentage to half or more of total dietary energy.

6 *The issue is one of quantity*

Ultra-processed products are mostly harmless consumed in relatively small quantities. The important cautionary note though, is that they are often formulated so as to be intensely palatable and habit-forming and indeed are quite often advertised as such. There is no clear line between this, and addiction. However, research conducted so far suggests that when ultra-processed products altogether amount to under 25 per cent of dietary energy, the overall nutrient profile of the diet is consistent with a low risk of obesity and other nutrition-related chronic diseases. The problem now though, is that in countries such as the US and UK, ultra-processed products supply well over a half – indeed, over 60 per cent – of all dietary energy.

7 *Ultra-processed products are like alcoholic drinks*

Like tobacco and alcohol, ultra-processed products are harmful, but in most respects they should not be categorised with tobacco. They also should not be categorised with fresh or minimally processed food, or with culinary ingredients, neither of

which are harmful in normal circumstances. Rather, ultra-processed products are similar to alcoholic drinks in a number of important respects. They are not harmful in small amounts. They are however habit-forming and some would say often at least quasi-addictive. They do displace healthy meals, dishes and foods and thus are liable to cause obesity or else at least mild malnutrition. And in excess – which in the case of countries like the US and UK means consumed in typical amounts – they are an important cause of serious diseases.

Conclusion

In this and other commentaries and papers, we and colleagues have made a new classification of edible foodstuffs, into group 1 fresh or minimally processed foods, group 2 culinary ingredients, and group 3 ultra-processed products. We maintain that this simple classification is, unlike those based on food groups or nutrients, an effective tool in addressing the whole issue of food, nutrition and health, and in particular the current uncontrolled pandemics of obesity, diabetes, and other serious chronic diseases.

This commentary is mainly concerned with one basic issue, which is what ‘ultra-processing’ means, and why the term ‘ultra-processed products’ is essential in addressing what is now a massive global human health crisis, and in preparation of necessary legislation.

References

- 1 Monteiro C. Nutrition and health. The issue is not food, nor nutrients, so much as processing [Commentary]. *Public Health Nutrition* 2009, **12**: 729-731.
- 2 Monteiro C. The big issue is ultra-processing.[Commentary] *World Nutrition*, November 2010, **1**, 6:237-269.
- 3 Monteiro C, Gomes F, Cannon G (2010) Can the food industry help tackle the growing burden of under-nutrition? The snack attack. *American Journal of Public Health* 2010, **100**: 975-981.
- 4 Monteiro C, Levy R, Claro R, Castro I, Cannon G. A new classification of foods based on the nature and extent and purpose of food processing. Its use to characterise food systems and dietary patterns. *Cadernos de Saúde Pública* November 2010; **26** (11): 2039-2049.
- 5 Monteiro C, Levy R, Claro R, Castro I, Cannon G. Increasing consumption of ultra-processed foods and likely impact on human health: evidence from Brazil. *Public Health Nutrition* 2011, **14**, **1**: 5-13.
- 6 Ludwig D. Technology, diet, and the burden of chronic disease. *Journal of the American Medical Association* 2011, **305**: 1352-1353.

- 7 Monteiro C. The big issue is ultra-processing. The good, the bad, and the toxic. [Commentary] *World Nutrition*, October 2011, 2, 9:496-507.
- 8 Moubarac, J-C. The big issue is ultra-processing. Sexing up ultra-processed products. [Commentary] *World Nutrition*, March 2012, 3, 3: 62-80.
- 9 Monteiro C, Cannon G. *El Gran Tema en Nutricion y Salud Publica es el Ultra-procesamiento de Alimentos*. Booklet. Lima: Peruvian Ministry of Health, May 2012. Obtainable at <http://minsa.gob.pe>
- 10 Monteiro C, Cannon G. The impact of transnational 'Big Food' companies on the South: A view from Brazil. *PLoS Medicine*. In press.
- 11 Patel R. *Stuffed and Starved. From Farm to Fork, the Hidden Battle for the World Food System*. London: Portobello, 2007
- 12 Roberts P. *The End of Food*. New York: Houghton Mifflin, 2008.
- 13 Pollan M. *In Defense of Food. An Eater's Manifesto*. New York: Penguin, 2008.
- 14 Ettlinger S. (Eschliman D, photographs). *Twinkie, Deconstructed: My Journey to Discover How the Ingredients Found in Processed Foods Are Grown, Mined (Yes, Mined), and Manipulated Into What America Eats*. New York: Penguin/ Hudson Street Press, 2007.
- 15 World Health Organization. Report of the 65th World Health Assembly, 21-26May 2012. See www.who.org.

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