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Commentary. The Food System. Ultra-processing

Big Food bitten

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Introduction

Note
This work is now being done in conjunction with the World Public Health Nutrition Association, as a project in support of and supported by the Association. The views expressed here should not be taken to be those of the Association.

São Paulo, Brazil. These months we have been busy. 'We' here, are the team at the Centre for Epidemiological Studies and Nutrition at the School of Public Health, University of São Paulo.

Last November we made a total of 12 presentations at the 16th conference of the association of Latin American Nutrition Societies (SLAN) held in Havana, Cuba. This for us marked the inauguration of our 'standard' Food System text, which we distributed in English, Spanish and Portuguese. This is basically the same as our December *WN* commentary. One of our slides is shown here below.

We are preparing a series of slides like this, for presentations in different parts of the world. The pictures on the left will always be different. They celebrate the variety of traditional and established food cultures, expressed in the form of meals enjoyed by family members. The pictures on the right will be from a relatively small set of branded products made by transnational corporations, now manufactured and advertised all over the world, as snacks that are displacing meals.

In February *The Lancet* published a series of papers designed to set the global public health agenda from 2015 to 2025. At the series launch in London emphasis was given

to the paper 'Profits and pandemics', summarised in a media brief prepared by *The Lancet* team. This links the policies and strategies of the tobacco, alcohol and ultra-processed food product industries. The authors of this paper, who included Carlos Monteiro, agreed the position developed by the São Paulo team as published in *WN*. Box 1 below was also boxed text in the *Lancet* paper.

Box 1

Ultra-processed products

This box was published in The Lancet paper on 'Profits and Pandemics' on 12 February: http://dx.doi.org/10/1016/50140-6736(12)62089-3

Ultra-processed products are made from processed substances extracted or 'refined' from whole foods – eg oils, hydrogenated oils and fats, flours and starches, variants of sugar, and cheap parts or remnants of animal foods – with little or even no whole foods. Products include burgers, frozen pasta, pizza and pasta dishes, nuggets and sticks, crisps, biscuits, candies, cereal bars, carbonated and other sugared drinks, and various snack products.

Most are made, advertised and sold by large or transnational corporations, and are very durable, palatable, and ready to consume, which is an enormous commercial advantage over fresh and perishable whole or minimally processed foods. Consequently, their production and consumption is increasing quickly worldwide.In the global North...ultra-processed products have now largely replaced food systems and dietary patterns based on [meals and dishes prepared from] fresh and minimally processed food and culinary ingredients, [which overall are less fatty, sugary and salty]. In the global South – ie Asia, Africa and Latin America – ultra-processed products are displacing long-established dietary patterns, which are more suitable socially and environmentally.

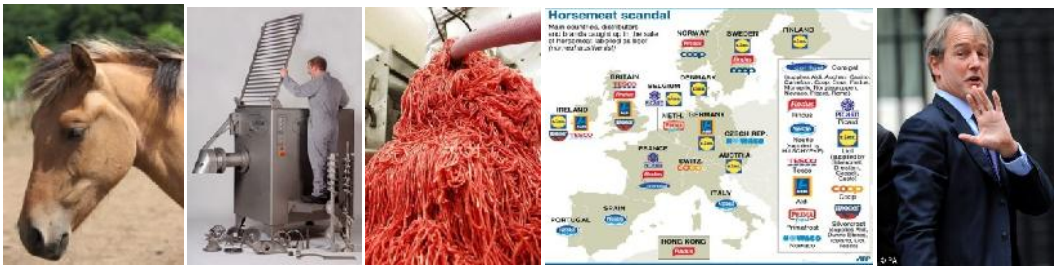
Ultra-processed products are typically energy-dense, have a high glycemic load, are low in dietary fibre, micronutrients and phytochemicals, and are high in unhealthy types of dietary fat, free sugars or sodium. When consumed in modest amounts and with other healthy sources of calories, ultra-processed products generally are harmless. However, intense palatability (achieved with high content of fat, sugar or salt, and cosmetic and other additives), omnipresence [from supermarkets to filling stations, to vending machines in offices, schools, and hospitals] and sophisticated and aggressive marketing strategies all make modest consumption of ultra-processed products unlikely and displacement of fresh or minimally processed foods very likely. Ultra-processed products harm endogenous satiety mechanisms and so promote energy overconsumption and thus obesity.

Big Food in big trouble

We originally planned this commentary as an account of the strategies being used by Big Food – the transnational and other huge corporations and their associates and supporters – in response to our testimony, and that of others. Impossible! In the last two months, the world's media have featured a sensational series of strikes against the Big Food empire. These are summarised in this commentary. An account of the transnationals' response will be published later.

Big Food is in big trouble. But almost all the big stories still are failing to get to the heart of what is the matter with what is becoming the globalised food system, now increasingly dominated in so many countries by ultra-processed products. What follows now are four brief accounts of revelations that taken together just may amount at last to a tipping point. First are extracts from striking media coverage, followed by comments.

Strike 1
Horsemeat lasagne



There is horse in UK meat products. From left: the source; the grinder; the ingredients; where horse comes from; the Minister welcoming press enquiries

London, February. 'Horsemeat scandal blamed on international fraud by mafia gangs' was the headline of a news feature in the UK national Sunday newspaper *The Observer* (1). It went on 'Polish and Italian mafia gangs said to be running scams to substitute horsemeat for beef during the food production process'. After the horse (left, above) the pictures show a small version of the machines used to grind blocks of frozen meat often coming from unknown sources; the results; a map of Europe showing where horsemeat may originate and travel from before arriving in UK supermarkets; and Owen Paterson, the UK minister responsible for food and agriculture, responding to press enquiries. Here follows extracts from *The Observer* feature:

'Organised criminal gangs operating internationally are suspected of playing a major role in the horsemeat scandal that has seen supermarket shelves cleared of a series of products. Sources close to the Department for the Environment, Food and Rural Affairs said it appeared that the contamination of beefburgers, lasagne and other products was the result of fraud that had an "international dimension".

'Experts within the horse slaughter industry have told the *Observer* there is evidence that both Polish and Italian mafia gangs are running multimillion-pound scams to substitute horsemeat for beef during food production. The environment secretary Owen Paterson on Saturday met representatives from the big four supermarkets, retail bodies and leading food producers to thrash out a plan to increase the amount of DNA testing of food.

'The first results of a new series of tests for equine DNA in "comminuted beef products" – where solid materials are reduced in size by crushing or grinding – will be published on Friday. "We have to be prepared that there will be more bad results coming through," Paterson said. He confirmed that the government was open to bringing in the Serious and Organised Crime Agency. "I'm concerned that this is an international criminal conspiracy here and we've really got to get to the bottom of it".

'Concerns about the substitution of horsemeat for beef first emerged in mid-January when supermarket chains withdrew several ranges of burgers. Fears of contamination prompted hundreds of European food companies to conduct DNA checks on their products. These resulted in the food giant Findus discovering that its frozen beef lasagne contained meat that was almost 100% horse. Supermarket chain Aldi has confirmed that two of its ready meal ranges produced by Comigel, the French supplier also used by Findus, were found to contain between 30% and 100% horsemeat. Comigel claims it sourced its meat from Romania, which has been subjected to export restrictions due to the prevalence of the viral disease equine infectious anaemia in the country.

'The scandal has raised questions about what happens to the 65,000 horses transported around the EU each year for slaughter. Partly as a result of welfare concerns, the trade in live horses has fallen dramatically. The decline in the cross-border trade in live horses has seen an increase in the sale of chilled and frozen horsemeat, much of which goes to Italy. Last year Romania significantly increased its export of frozen horsemeat to the Benelux countries. Attention is now focusing on eastern Europe, a major supplier of horsemeat to France and Italy. Some of the meat that went into Ireland came from suppliers in Poland, which exports around 25,000 horses for slaughter each year. Industry sources also suggested to the *Observer* that gangs operating in Russia and the Baltic states were playing a role in the fraudulent meat trade'.

Comments

In our classification we state that many meat products, including pre-prepared ready-to-heat dishes, are ultra-processed, being principally formulated not from foods but from ingredients that include scraps and remnants of meat. This has been criticised on the grounds that these products are mostly made from meat in the ordinary sense of the word. The horsemeat scandal, with its information about 'comminuted meat' and huge blocks of product kept frozen for months, gives an idea of the nature of the animal ingredients in many ultra-processed products. Nutritionally horse is not significantly different from beef or pork, but the distances travelled by the horses, whether alive, dead or comminuted, are impressive.

Strike 2
Processed meat and cancer

Is this the doom of the bacon sandwich, and of ham, salami, other processed meat products including hot dog pizzas? Plus (right) a satirical comment

London, March. 'Processed meat scare: a bacon sandwich won't kill you … will it?' was the *Guardian* headline (2). As with the horsemeat scandal, the processed meat and colon cancer story hit the news headlines all over the world in early March. Are processed meat products like bacon and ham, and ultra-processed meat products like pizza toppings and hot dogs, seriously carcinogenic? Is this (above, right) the revenge of the animals? *The Guardian* said:

' New research linking consumption of large amounts of processed meat to an increased risk of early death, heart disease and cancer confirms the emerging evidence surrounding health risks posed by various forms of processed food, not just meat products such as bacon, salami and sausages. With our growing reliance on food that is processed rather than fresh, such as ready meals, food from packets or tins and takeaways including pies and pasties, the implications of this gathering proof of hazard has major implications for public health, and should prompt us to

find the time, confidence or willpower to cook more often and potentially avoid processed meat altogether. The latest findings are based on studying the diet and health of almost 450,000 people in 10 European countries for many years. They show that eating a lot of processed meat causes 3% of premature deaths and increases risk of dying from heart disease by 72% and from cancer by 11%.

'Catherine Collins, principal dietitian at St George's Hospital in London, believes that "saturated fat content, salt and nitrates, and burnt proteins (heterocyclic amines) from the cooking process may all play some part". Victoria Taylor, a senior dietitian with the British Heart Foundation, says: "From a heart disease perspective, foods such as sausages, bacon, ham, salami and chorizo are usually high in salt and saturated fat. Eating too much saturated fat is linked to raised levels of bad cholesterol and too much salt to high blood pressure".

"The same baddies – fat, salt and sugar – are found in plenty of other foods, so it's not just processed meat we should be cautious about", she adds. Foods which have been processed also include bread, breakfast cereals, savoury snacks such as crisps and ready meals. "It's the things that are added that produce the health risks. For example, a plain piece of pork doesn't constitute a risk on its own. But the risk increases when you eat pork in a processed way, as bacon or sausages, because in the process saturated fat and salt are added, to preserve it or for taste".

'The World Cancer Research Fund recommends shunning processed meat. It has said so since 2007, when a huge study it produced recommended abstinence and sparked outrage from the meat industry. WCRF says strong evidence shows that eating 50 grams a day of processed meat – one sausage or two slices of bacon – increases risk of bowel cancer by 18% and that having 100g a day raises it by 36%.

'On processed food as a whole, many such products are high in fat and sugar, which can contribute to someone becoming overweight or obese, which itself can increase the risk of cancer. WCRF has identified seven forms of cancer which are linked to obesity. They are cancer of the breast, bowel, pancreas, kidneys, oesophagus and gall bladder, and womb. In addition eating large amounts of salt, another staple ingredient of processed foods, heightens the risk of stomach cancer. About 4,000 fewer people would be diagnosed with bowel cancer if people ate less processed meat than the equivalent of three rashers of bacon a week.

'The evidence implicating processed or red meat, and processed food more generally, in illness, has been building up. Last year the Harvard School of Public Health also linked intake of red and processed meat to a raised risk of death from cancer or heart disease and early death, as today's new study does. Diets containing a lot of processed food have also been linked to dementia, depression and other illnesses.

'So is it time to cut out processed meat entirely? Privately, some experts and health campaigners agree with WCRF, who do say that. They preach moderation, not abstinence, for pragmatic reasons. But all the while the evidence is gradually stacking up that processed meat is risky – and perhaps not a risk worth taking'.

Comments

Since the 1997 WCRF report it has been clear that while habitual consumption of red meat in general increases the risk of colon cancer, processed meat products are much more problematic. And as indicated in the *Guardian* news feature, the issue is not so much the meat, as the methods used to make processed meat products. The *Guardian* story is enlightened, in that it extends the point and recommends less reliance on processed products generally, and instead, a return to freshly cooked meals.

Strike 3
Maxed out on Lunchables

Michael Moss of The New York Times; Bob Drane of Kraft; Philip Morris/ Kraft former bosses Geoffrey Bible, Bob Eckert; the new NYT #1 best-seller

New York, February. In the US, the national news agenda is often set by *The New York Times*, which now runs regular major stories by writers given scope. As well as veteran Marion Burros, four are Michael Pollan, Mark Bittman, Gary Taubes; and Pulitzer Prizewinner Michael Moss, whose book *Salt Sugar Fat. How the Food Giants Hooked Us* (3), published last month and tied in with a major NYT feature (4), has immediately become the number 1 best-seller. The book shows that Big Food, transnational corporations based in the US, deliberately – and quite understandably – formulates products that are meant in most usual senses of the word to be addictive. Here follows just one story told in the book, about Lunchables, made by Kraft, then owned by Philip Morris, taken from the *NYT Magazine* feature.

'The 1980s were tough times for Oscar Mayer. Red meat consumption fell more than 10 percent as fat became synonymous with cholesterol, clogged arteries, heart attacks and strokes. Anxiety set in at the company's headquarters in Madison, Wisconsin, where executives worried about their future and the pressure they faced from their new bosses at Philip Morris. Bob Drane was the company's vice president for new business strategy and development when Oscar Mayer tapped him to try to find some way to reposition bologna and other troubled meats. I met Drane at his home in Madison. In 1985, when Drane began working on the project, his orders were to "figure out how to contemporize what we've got."

'Drane's first move was to try to zero in not on what Americans felt about processed meat but on what Americans felt about lunch. He organized focus-group sessions with the people most responsible for buying bologna – mothers – and as they talked, he realized the most pressing issue for them was time. Working moms spoke with real passion and at length about the morning crush, that nightmarish dash to get breakfast on the table and lunch packed and kids out the door

'He assembled a team of about 15 people with varied skills, from design to food science to advertising, to create something completely new – a convenient prepackaged lunch that would have as its main building block the company's sliced bologna and ham. They wanted to add bread, naturally, because who ate bologna without it? But there was no way bread could stay fresh for the two months their product needed to sit in warehouses or in grocery coolers. Crackers, however, could – so they added a handful of cracker rounds to the package. Using cheese was the next obvious move. But Natural Cheddar, which they started off with, crumbled and didn't slice very well, so they moved on to processed varieties, which could bend and be sliced and would last forever, or they could knock another two cents off per unit by using an even lesser product called "cheese food". The cost dilemma was solved when Oscar Mayer merged with Kraft in 1989 and the company got all the processed cheese it wanted from its new sister company, and at cost.

'Drane's team set out to find the right mix of components and container. They gathered around tables where bagfuls of meat, cheese, crackers and all sorts of wrapping material had been dumped, and they let their imaginations run. The model they fell back on was the American TV dinner – and after some brainstorming about names (Lunch Kits? Go-Packs? Fun Mealz?), Lunchables were born.

'The trays flew off the grocery-store shelves. Sales hit a phenomenal $218 million in the first 12 months, more than anyone was prepared for. This brought Drane his next crisis. The production costs were so high that they were losing money with each tray they produced. So Drane flew to New York, where he met with Philip Morris officials who promised to give him the money he needed to keep it going. "The hard

thing is to figure out something that will sell," he was told. "You'll figure out how to get the cost right." Projected to lose $6 million in 1991, the trays instead broke even; the next year, they earned $8 million.

'The next question was how to expand the franchise, which they did by turning to one of the cardinal rules in processed food: When in doubt, add sugar. "Lunchables With Dessert is a logical extension," an Oscar Mayer official reported to Philip Morris executives in early 1991. The "target" remained the same as it was for regular Lunchables – "busy mothers" and "working women," ages 25 to 49 – and the "enhanced taste" would attract shoppers who had grown bored with the current trays. A year later, the dessert Lunchable morphed into the Fun Pack, which would come with a Snickers bar, a package of M&Ms or a Reese's Peanut Butter Cup, as well as a sugary drink. The Lunchables team started by using Kool-Aid and cola and then Capri Sun after Philip Morris added that drink to its stable of brands.

'Eventually, a line of the trays, called Maxed Out, was released that had as many as nine grams of saturated fat, or nearly an entire day's recommended maximum for kids, with up to two-thirds of the max for sodium and 13 teaspoons of sugar. When I asked Geoffrey Bible, former CEO of Philip Morris, about this shift toward more salt, sugar and fat in meals for kids, he smiled and noted that even in its earliest incarnation, Lunchables was held up for criticism. "One article said something like, if you take Lunchables apart, the most healthy item in it is the napkin". Well, they did have a good bit of fat, I offered. "You bet," he said. "Plus cookies".

'The prevailing attitude among the company's food managers through the 1990s, before obesity became a more pressing concern, was one of supply and demand. "People could point to these things and say, 'They've got too much sugar, they've got too much salt,' " Bible said. "Well, that's what the consumer wants, and we're not putting a gun to their head to eat it. That's what they want. If we give them less, they'll buy less, and the competitor will get our market. So you're sort of trapped."

'When it came to Lunchables, they did try to add more healthful ingredients. Back at the start, Drane experimented with fresh carrots but quickly gave up on that, since fresh components didn't work within the constraints of the processed-food system, which typically required weeks or months of transport and storage before the food arrived at the grocery store.

'When I met with Kraft officials in 2011 to discuss their products and policies on nutrition, they had dropped the Maxed Out line and were trying to improve the nutritional profile of Lunchables through smaller, incremental changes. Across the Lunchables line, they said they had reduced the salt, sugar and fat by about 10 percent, and new versions, featuring mandarin-orange and pineapple slices, were in

development. These would be promoted as more healthful versions, with "fresh fruit," but their list of ingredients – containing upward of 70 items, with sucrose, corn syrup, high-fructose corn syrup and fruit concentrate all in the same tray – have been met with intense criticism from outside the industry.

'One of the company's responses to criticism, is that kids don't eat the Lunchables every day – on top of which, kids themselves were unreliable. When their parents packed fresh carrots, apples and water, they couldn't be trusted to eat them. Once in school, they often trashed the healthful stuff in their brown bags to get right to the sweets. In what would prove to be their greatest achievement of all, the Lunchables team would delve into adolescent psychology to discover that it wasn't the food in the trays that excited the kids; it was the feeling of power it brought to their lives. As Bob Eckert, then the CEO of Kraft, put it in 1999: "Lunchables aren't about lunch. It's about kids being able to put together what they want to eat, anytime, anywhere."

'With this marketing strategy in place and pizza Lunchables – the crust in one compartment, the cheese, pepperoni and sauce in others – proving to be a runaway success, the entire world of fast food suddenly opened up for Kraft to pursue. They came out with a Mexican-themed Lunchables called Beef Taco Wraps; a Mini Burgers Lunchables; a Mini Hot Dog Lunchable, which also happened to provide a way for Oscar Mayer to sell its wieners. By 1999, pancakes – which included syrup, icing, Lifesavers candy and Tang, for a whopping 76 grams of sugar – and waffles were, for a time, part of the Lunchables franchise as well.

'Annual sales kept climbing, past $500 million, past $800 million; at last count, including sales in Britain, they were approaching the $1 billion mark. Lunchables was more than a hit; it was now its own category. Eventually, more than 60 varieties of Lunchables and other brands of trays would show up in the grocery stores. In 2007, Kraft even tried a Lunchables Jr. for 3- to 5-year-olds.

'Drane himself paused only briefly when I asked him if, looking back, he was proud of creating the trays. "Lots of things are trade-offs," he said "In the end, I wish that the nutritional profile of the thing could have been better, but I don't view the entire project as anything but a positive contribution to people's lives." He has prepared a précis on the food industry that he uses with medical students at the University of Wisconsin. "What do University of Wisconsin MBAs learn about how to succeed in marketing? Discover what consumers want to buy and give it to them with both barrels. Sell more, keep your job! How do marketers often translate these 'rules' into action on food? Our limbic brains love sugar, fat, salt. . . . So formulate products to deliver these. Perhaps add low-cost ingredients to boost profit margins. Then 'supersize' to sell more. . . . And advertise and promote to lock in heavy users."'

Comments

As with Eric Schosser's *Fast Food Nation,* this new full account of how ultra-processed products are made, with what motivation, is told by an investigative reporter given time and scope by a well-resourced journal. Many of the people Michael Moss interviews have been senior executives in food manufacturing corporations who have retired or moved out of that business, some of whom seem relieved to have the opportunity to state where they have been and what they have done. The sting in the book and in the *New York Times Magazine* extract, is that manufacturers set out to devise products that are seriously habit-forming – or actually addictive, as the feature headline states – and that the competition between corporations obliges them to do this. Michael Moss's book, likely to be a best-seller in the US for some time, just may change the name of the game.

Strike 4
Sugar fixes

Everybody knows about 'sugar hits' and 'cookie fixes'. But according to leading US drug authority Nora Volkow (right) these terms are not a joke

New York. Three strikes and out? *WN* and the Association home page have both recently run commentaries and stories about food addiction (5-7). Michael Moss himself published specifically on this topic in *The New York Times Magazine* in late 2011 with a feature 'Can food be as addictive as a drug'? (8). An extract follows:

'We crave certain foods so much that they seem addictive. Just thinking about cinnamon buns or pizza stimulates the release of the neural chemical dopamine, which can cause the brain to override the biological brakes that try to prevent overeating. According to *Why Humans Like Junk Food*, by a former Nestlé scientist named Stephen Witherly [featured in Michael Moss's 2013 book] the brain especially loves mixtures of salt, sugar and fat and the emulsive textures of butter, mayonnaise and chocolate.

'Witherly has developed what he calls the food-pleasure equation, in which Pleasure = Sensation + Calories. When we eat a combination of sugar, fat and salt, he says, we get a huge synergistic bang, first in the parts of the brain that register pleasure and then in the gut, which detects and responds more favorably to the high calories in sugar and fat. It's caveman stuff, going back to when we learned to eat big-calorie foods to survive.

'But can cravings for sweet or salt or fat be classified as actually, legitimately addictive? The processed-food industry doesn't much like the A-word, preferring its own coinage: craveability. With financing from the World Sugar Research Organization, Welsh psychology professor David Benton has argued that food cravings do not meet the technical requirements of addiction.

'Dr. Nora D. Volkow, the director of the National Institute on Drug Abuse, says that drugs can set off brain responses that are far more powerful than those caused by even the most luscious food. On the other hand, she notes "clearly, processed sugar in certain individuals can produce these compulsive patterns of intake". The difficulty of trying to kick a food habit, however, is that you can't just go cold turkey from all food. Still, the best strategy for the afflicted, according to Volkow, is to mimic drug programs and completely avoid foods that cause the most trouble. "'Don't try to limit yourself to two Oreo cookies, because if the reward is very potent, no matter how good your intentions are, you are not going to be able to control it".

Comments

Nora Volkow is now much more definite in her identification of food addiction, which she now classes comparably with addiction to hard drugs (5-7). This is the final refutation of the notion that 'a calorie is a calorie'. Ultra-processed products are formulated to be hyper-palatable and habit-forming – which in many senses means addictive, Accounts so far of food addiction centre on sugar itself, whose impact on the body's metabolic processes do mimic an addictive process. But the issue here is not sugar as such, but intense doses of 'free sugars' created by ultra-processing, notably in sugared soft drinks and sugared breakfast cereals and baked goods. It's likely also that various chemical additives are formulated to accelerate this process.

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