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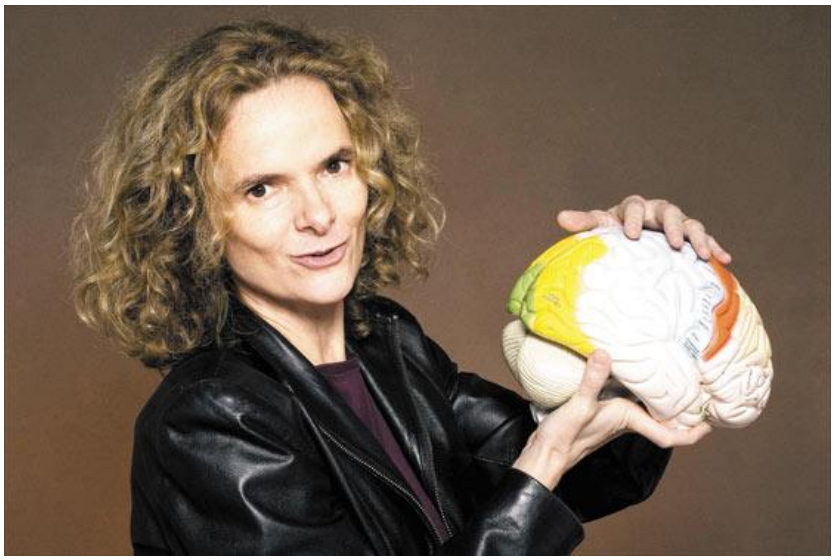
Editorial. Addiction

Food on the brain



Are some food products addictive? Yes, says Nora Volkow (above) director of the US National Institute on Drug Abuse. 'The data are overwhelming'

People who write about food and health, sooner or later learn that it unwise to say that food could be toxic, or that food could be addictive. These are charged terms. Besides, it is obviously absurd to say that food in general is unhealthy, in any respect. There are a vast number of foods and edible products. Food nourishes us. We need food. Obviously food in general is not like strychnine, say, or cocaine. So anybody who suggests that food can be toxic or addictive has usually been dismissed as ignorant, irresponsible, even cracked.

But nobody has ever seriously suggested any such thing, of food in general. What is claimed from time to time is that certain foods, or certain substances in food, may be or are toxic or addictive. This is not an outrageous idea. After all, microbial contamination aside, some fungi and some fish contain substances that can be deadly, and everybody knows that alcohol is or at least can be addictive. Is this where the line is drawn? And in particular, may some food products become toxic or addictive as a result of manufacturing processes? These are hot topics.

Toxicity – the case of trans fats

In 1950 Norbert Wiener, a founding father of the electronic revolution, published a valedictory book on science and technology, warning of unforeseen consequences (1). He gave an example. 'With our modern chemical technique, we can hydrogenate or dehydrogenate fats as we please...Even minute quantities of these and other deleterious products may be fatal after many years of innocuous use, and may contribute to the toll of degenerative disease. It is certain that the processing of foods is subjecting us to many risks...which may not show themselves until it is too late to do anything much about them'.

Norbert Wiener was a mathematician at the Massachusetts Institute of Technology, and it's unlikely that anybody then listened to him on the topic of food science. However, most people outside industry probably would now agree that he was right, and that *trans* fats are toxic.

Thus, Association founder member Walter Willett, with his team at the Harvard School of Public Health, has studied the epidemiology and the metabolism of *trans* fats since the early 1990s (2,3). He states that they are toxic, not so much because they increase the risk of cardiovascular disease more intensively than saturated fats, as because they provoke a general inflammatory response throughout the body and have other clear adverse metabolic effects. In this sense they act like a slow poison.

Five years ago he was quoted by campaigners as saying: '*Trans* fat is a toxic chemical, and it does not belong in food any more than arsenic, lead or DDT' (4). He has also said that industrially generated *trans* fats represent 'the biggest food processing disaster in US history'. Around the same time he said: 'New York City's steps to ban the use of *trans* fat by restaurants is simply good public health in practice. A toxic

chemical is being removed from our food so that customers can be confident that what they eat is as safe as possible. Other cities are sure to follow' (5).

Food labels now usually state the quantity of *trans* fats in the product, as volunteered by manufacturers, or as now required by law in the US and other countries. Sixty years after Norbert Wiener's book was published, the UN Food and Agriculture Organization suggested that there is no safe amount of *trans* fat in processed products (6). Association founder member Carlos Monteiro proposes that the partial hydrogenation process by which *trans* fats are generated should be prohibited (7).

The main point here is that a significant constituent of food is now generally agreed to be toxic. This has changed the food and nutrition policy landscape.

Addiction – it's no joke

When people say they are 'gagging' for a soft drink, or when they raid the refrigerator at night, can they control themselves? If not, are they addicts?

So what about addiction? Jokes about some types of food and drink being addictive are commonplace. People may say that they are 'gagging' for a soda (cola drink) or that they need a coffee 'fix', or a 'hit' from a Danish pastry, or that they (or others) are 'chocaholics'. But the implication of these nervous remarks is that the people who make them really do need the products. They may even say that they get shaky until they consume them. Are they addicted? And if so, exactly to what?

Advertisements for food products commonly emphasise their intense palatability and habit-forming qualities, again usually in a somewhat jokey style, designed to give the impression that there is no real suggestion of addictive qualities. The 'health' pages of popular magazines frequently run stories on compulsive eating, illustrated with humorous pictures like the one above. These also usually stop short of saying that food really can be addictive. The attitude of health professionals often seems to be that anybody can stop themselves gorging and bingeing on food, and if they can't,

there's something wrong with them rather than with the food. Most research on people who eat and drink all the time and become grossly obese, examines deranged metabolic processes.

Serious study has until recently almost always stopped short of saying that some foods or products can or are be really addictive. One reason is that nutrition research focuses on the physical effects of food, and not its mental or emotional impact, which is why alcohol is often classed not as a food but as a drug. Another reason is that research on brain function is a separate discipline. Also, common sense recoils from the idea that food could have similar effects to tobacco, alcohol – or cocaine. Further, any serious suggestion that specific foods are really addictive would be liable to provoke a furious reaction from manufacturers.

But as with toxicity, nobody is seriously suggesting that food in general is like tobacco, alcohol or cocaine. Food is not the issue. The issue is specific substances in food: caffeine and added sugar are often identified. Less is known about some of the formulations of fats, sugars, and salt combined with chemical additives, designed to make products intensely palatable and, as delicately termed, 'more-ish', for these are commercially confidential.

A new age begins

Nora Volkow, pictured at the beginning of this editorial, is now changing informed opinion on food addiction. She is now having the same sort of impact as Walter Willett has had on the issue of food toxicity, and for similar reasons. She has a distinguished international reputation as a researcher on the effect of drugs. She has one of the most influential positions in her field: since 2003 she has been director of the US National Institute on Drug Abuse, which supports most of the world's research on the health aspects of drug abuse and addiction. (She also has a quotable ancestry, being a great-granddaughter of Leon Trotsky).

Also like Walter Willett, she is outspoken, and gives interviews to the popular media. Last November a story in *Bloomberg News* (8) began as follows: 'A growing body of medical research at leading universities and government laboratories suggests that processed foods and sugary drinks… aren't simply unhealthy. They can hijack the brain in ways that resemble addictions to cocaine, nicotine and other drugs. "The data are so overwhelming the field has to accept it," said Nora Volkow… "We are finding tremendous overlap between drugs in the brain and food in the brain."'

In July this year she gave the keynote address at the British Association for Psychopharmacology annual meeting. She was paraphrased in newspapers all round the world including the top-selling UK *Daily Mail* (9) as stating that in a junk food culture, the chemical signals produced by the stomach to say we are full, can no longer override the brain's pleasure centres. 'That is what dessert is all about,' she

said 'They are bringing you a food that can overcome the satiety signals, so even though you are full, you eat it because of the pleasure it generates'. The laboratory research that she and her team and others have done, including on humans using magnetic resonance imagery, shows that certain foods act on the same brain pleasure centres as do hard drugs, cigarettes and alcohol.

In April she gave what the health section of *Time* magazine (10) described as an 'impassioned' lecture at New York's Rockefeller University. She was reported as emphasising common factors between food and drug addictions. She pointed out that 'If you look at people who take drugs, the majority are not addicted'. She described the common dysfunctions in the areas of the brain involved in pleasure and self-control that are seen in both food and drug addictions.

No one scientist, however distinguished and well resourced, is going to change public let alone official views on food and addiction. But help is at hand. This month *WN* publishes a commentary by the distinguished scientists Kelly Brownell, director of the Rudd Center for Food Policy and Obesity at Yale University, and Mark Gold, chair of the psychiatry department at the University of Florida in Gainesville. It is an adaptation of the conclusion of their *Food and Addiction: A Comprehensive Handbook*., whose chapters are written by a series of authorities in the field (12). The book was published on 31 August, the day before this issue of *WN* went on-line.

Here is a passage from the conclusion. 'Food can act on the brain as an addictive substance. Certain constituents of food, sugar in particular, may hijack the brain and override will, judgment and personal responsibility, and in so doing create a public health menace. The foods most likely to trigger an addictive process appear to be those marketed most aggressively by industry, which manipulates its products to maximize palatability. Just like drugs of abuse, brain-rewarding effects or reinforcement from food can lead to loss of control. Vast numbers of people are likely to be affected, particularly those most vulnerable such as youth. The addictive impact of food may be a contributor to the global health crises created from obesity and diabetes, to the point where legislative and legal efforts might be informed by advances in this field, much as they were with tobacco'.

So the game changes here. The next question is: which foods, and which substances, are most liable to be addictive? As Kelly Brownell and Mark Gold say, the answer may lead to a real breakthrough in obesity control, starting with young children.

Predictably, the industry does not go along with any of this thinking. Richard Adamson, a pharmacologist and consultant for the American Beverage Association, is quoted as saying 'I have never heard of anyone robbing a bank to get money to buy a candy bar or ice cream or pop' (8). But there is an answer to that. There is no need to rob a bank. Pop is cheap.

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To order the book please go to http://www.amazon.com/Food-Addiction-A-Comprehensive Handbook/dp/0199738165 /ref= sr_1_ 4?ie= UTF8&qid=1344867608&sr=8-4&keywords=kelly+brownell

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