

The rise and fall of *trans* fat: is the battle won?

"We are indeed much more than what we eat, but what we eat can nevertheless help us to be much more than what we are." Adelle Davis (1904-1974)

Unsaturated, saturated, polyunsaturated or *trans*, one gram of fat will provide you with nine calories of energy; considerably more calories than provided by the same weight of protein or carbohydrate. However, while all fats may result in weight gain, they have different effects on our hearts.

Fats contain long fatty acid chains, and depending on the number of hydrogen atoms in the chain, a fat will either be 'saturated' (containing the maximum number of hydrogens) or 'unsaturated' (containing less than the maximum). By subjecting unsaturated fats to a chemical process of partial hydrogenation, their configuration can be twisted from their typical '*cis*' shape into a '*trans*' orientation.

Trans fats are of particular use to the food industry because they have a higher melting point than *cis* unsaturated fats, increasing shelf-life and also improving flavour stability of foods. Ten years ago, the European Union (EU) published a study that identified which foods were contributing to the highest proportion of dietary *trans* fats in 14 Western European countries. The study showed that, in general, partially hydrogenated oils and fats were the biggest culprits, although results did range widely between countries (from 0.4% in Greece to 46.4% in Norway). Biscuits and cakes made up from 6.6% (Finland) to 20.6% (Sweden) of dietary *trans* fat intake. Other sources included chips and savoury pies.

Unlike other unsaturated fatty acids which protect against heart disease, *trans* fatty acids do the opposite, and their effects on the cardiovascular system are even worse than those of saturated fats. While saturated fats just increase 'bad cholesterol' (low density lipoproteins – LDL), *trans* fats also decrease 'good

cholesterol' (high density lipoproteins – HDL).

Trans fats do occur naturally in meat and dairy produce – principally as vaccenic acid. However, studies suggest that these *trans* fats do not have the same negative health effects as those industrially produced, and one example, conjugated linoleic acid (CLA), has even been shown to have anti-carcinogenic functions. In this article, the term '*trans* fat', does not refer to those fats produced naturally.

The WHO states that "there is convincing evidence" of the relationship between *trans* fats and an increased risk of developing cardiovascular disease. Current statistics suggests that consuming just 5g per day can increase risk of coronary heart disease by 25%. The WHO also recommends that, "to promote cardiovascular health, diets should provide a very low intake of *trans* fatty acids," and that in practice this implies "an intake of less than 1% of daily energy intake." The UK Government guidelines are not quite that stringent, but suggest that no more than 2% of intake should be *trans* fat.

In March 2003, Denmark became the first country in the world to ban all but very small quantities of *trans* fat in food (the law states that no more than 2% of the fats and oils in any food product can be *trans* fat). Heart disease rates have subsequently declined by more than 20%. Some US cities have introduced their own bans, including New York City and Philadelphia, and in July 2008, California became to first US state to introduce a ban, incorporating restaurants and school cafeterias as well as packaged food. Many other cities, states and countries are still in the process of deliberating over their own *trans* fat legislation. Canada was the first country to require food labels to list the *trans* fats present in packaged food.

In May 2003, Ban *Trans*Foods Inc, a Californian non-profit corporation, committed to the eradication of *trans* fats from food, took the unprecedented step of taking Kraft Foods to court over the *trans* fat levels in its Oreo cookies. They called for an injunction forcing Kraft to "cease and desist marketing and selling Oreo Cookies to children in the State of California, until such cookies contain no partially hydrogenated oil or other *trans* fat." The case was a success – following massive media coverage, Kraft Foods agreed to reduce *trans* fats without either party setting foot in a court room. As hoped by Ban *Trans*Foods Inc, this result has subsequently resulted in other food companies following suit, and from January 2006 the US Food and Drug Administration (FDA) ruled that all *trans* fat in packaged food must be labelled – although if foods contain less than 0.5g they can still be labelled '*trans* fat free'.

A study published in the New England Journal of Medicine in April 2006 looked at levels of *trans* fats in KFC and McDonald's fast food in 20 countries around the world. It demonstrated that there was a huge range in the levels of *trans* fats present, based upon which oils were used for cooking. Denmark and Germany had less than 1g *trans* fat per serving in the foods tested, whilst McDonald's in New York had 10g, and KFC in Hungary had 24g. Fifty percent of the servings studied had more than 5g of *trans* fat. The study demonstrated how possible it is to avoid the use of *trans* fats – if only the will is there to choose healthier options by large corporations.

"I think it is now clear that the task of removing *trans* fat from the food supply is really not that difficult – it can be done," says Oliver Tickell, Founder of tfX, the

UK campaign against *trans* fats in food. “The main cost for a company is not actually in the higher ingredient cost, the main cost is simply the management focus and attention.”

In a recent paper published in the European Journal of Clinical Nutrition, Mozaffarian and Clarke identified the types of food stuffs that should be used to replace *trans* fatty acids. They demonstrated that using soy bean or canola oil as a substitute provided huge reductions in cardiovascular disease risk – up to 39.6% and 38.6% respectively in hydrogenated oils containing 45% *trans* fats. They conclude, “Our findings indicate that the replacement of PHVO [partially hydrogenated vegetable oils] with alternative fats and oils would substantially lower CHD [coronary heart disease] risk.”

This is advocated by the British Heart Foundation. “The BHF would recommend that food manufacturers work to reduce the *trans* fatty acid content of foods – or the oil in which they are cooked – as alternatives are available,” says Alex Callaghan, Policy Officer. “Such measures would help to ensure that the population’s consumption of *trans* fatty acids would not rise above maximum recommended levels in the future.”

In the UK many food companies have taken the initiative and sought to remove *trans* fats from their food – without any government legislation to force their hand. It is due to this action that *trans* fat levels in the UK diet are on average half UK recommended maximum levels. At the end of 2007, the Food Standards Agency (FSA) published a report which highlighted the progress made. They reported that according to the Margarine and Spreads Association, all brands of spread available in the UK now contain less than 1g of *trans* fat per 100g. The majority of biscuits, cakes and pastries had also reached these levels according to information provided by the Biscuit, Cake, Chocolate & Confectionery Association. In addition, many supermarkets have addressed the issue, with Sainsbury’s being

the first supermarket to remove *trans* fats from their own brand products.

Yet despite the progress made, there is no law to prevent the use of *trans* fats in UK food (the FSA ruled that this was not necessary as intake levels are already low), and there is also no requirement for labelling of *trans* fats on packaged foods. There is also the concern that unpackaged foods (i.e. those sold in canteens, fast food outlets or bakeries) have no controls, and there is nothing to inform consumers about *trans* fat levels in the foods they buy. “Doubtless there are hundreds or thousands of fish and chip shops and canteens that are using hydrogenated oil up and down the country, but we, as customers, don’t know which ones they are,” comments Oliver Tickell.



Whether or not the labelling of foods is the answer produces a mixed response. Alex Callaghan says, “The British Heart Foundation does not believe there is currently enough evidence to support government action such as a ban on *trans* fatty acids. However, we do believe that manufacturers and retailers should clearly label *trans* fatty acids, so that people can make informed decisions about their diets.”

Oliver Tickell however disagrees. “I think that labelling is an imperfect solution. There are always those people who don’t read labels or who don’t understand labels, or take any notice, and I don’t think that people’s health ought to be subject to that consideration.” In Denmark, having looked at both options, they concluded that a ban on *trans* fats was a much better solution than labelling. “They decided that the people who don’t read labels

should get the same protection as for their health,” says Mr Tickell.

The Danish example shows that there is nothing in EU law to prevent countries bringing in *trans* fat legislation, and that the EU will not stand in the way of constituent countries who wish to bring in similar laws. However the EU itself has not addressed this issue, despite the evidence that bringing in Europe-wide legislation would help to address the health needs of its citizens – particularly in those countries where governments are unwilling or unable to tackle the issue themselves.

The World Health Organisation (WHO) is clear that the *trans* fat issue is particularly pertinent to the developing world, and states that the recommendation of less than 1% of daily energy intake from *trans* fats is “especially relevant in developing countries where low cost hydrogenated fat is frequently consumed”. Examples of this include the fats most commonly used for home cooking in Iran, which contain 34-36% *trans* fat, and in India, vanaspati, a margarine-like food stuff commonly used in cooking, can contain up to 43% *trans* fatty acids. Anti-*trans* fat movements have begun in Singapore, Malaysia and South America.

Clearly much has been done to tackle *trans* fats since the beginning of the 21st century, but there remains substantial work to be done. Cardiovascular disease is a huge killer worldwide, and it seems a real missed opportunity not to make concerted efforts globally to reduce *trans* fat in food. It is too soon to claim that the *trans* fat issue has been dealt with – and focus now needs to turn to the developing world where, in many cases, *trans* fats have not yet even made it onto the health agenda.

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