

MA PUBLIC POLICY

“Why are trans fats banned in 3 places - Denmark, Switzerland and California, yet the UK is not committing to banning this food preservative?”

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SUBMISSION DATE: 23/04/2010

WORD COUNT: 6975

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INTRODUCTION

Trans fats (TFs) are preservatives found in foods. Scientific evidence showing significant risk to health from TFs has led to much scientific, government and public review since 1994 and subsequent legislation in some areas reducing their limits in foods. The first legislation to this effect came into force in January 2004 in Denmark; Switzerland and states in the United States (US) then followed. However, the United Kingdom (UK) only has voluntary agreements in place, and there are no requirements regarding their labelling. Is this a situation that needs to change for the UK, as there is increasing medical evidence highlighting their detrimental effects on health? Why has the UK not followed the lead of these other countries?

In order to understand the issues surrounding TFs, this essay will first provide some background information. Then, it will discuss policy in those countries and American states that have passed legislation. This will be an in depth analysis of why these areas took the move to legislate against TFs and the difficulties that they encountered in doing so. Finally, it will explore the UK's position on TFs, using a case study of one supermarket to highlight the issues the UK government faces.

BACKGROUND

What are TFs and how are they produced?

TFs are unsaturated fatty acids. That means they have a minimum of one double bond in the 'trans' configuration (EFSA 2004 p 1), rather than the common 'cis' configuration (SACN 2007 p 1). The altered configuration of the double bond causes physiochemical and functional changes of the fatty acid, and also has consequences for the way it is metabolised in the human body (SACN 2007 p 1). It is because TFs have this particular chemical structure that there are health implications.

TFs originate from three main sources, but are predominantly man-made, being a by-product of the hydrogenation process of liquid vegetable oils being turned into solid fats (Stanfield 2010, Maryon-Davis 2010). TFs are also created during heating and frying of oils at very high temperatures (EFSA 2004 p 1).

Natural TFs are not a health risk (News-Medical 2010). Trace amounts of healthy 'TFs', also known as vaccenic acid and conjugated linoleic acid, occur naturally in meat, milk and dairy products, (Stanfield 2010, News-Medical 2010). These 'TFs' are created by bacterial transformation of unsaturated fatty acids in the rumen of ruminant animals (EFSA 2004 p 1). These healthy natural 'TFs' are excluded from the international standardized trade definition of TF in Codex Alimentarius, as they have a different chemical structure from unhealthy TF (News-Medical 2010). For the purposes of this essay, the use of the term "TF" shall from now on refer to only unhealthy TF that is industrially produced (IP) from the first 2 sources described above.

History of TFs

IP-TFs were first created in 1903 by a German chemist, Wilhelm Norman, who was experimenting to find an alternative to tallow, an ingredient, expensive at the time, used in candles (Stanfield 2008). Norman discovered that boiling cottonseed oil to a temperature of 260 degrees Centigrade with a catalyst, caused the oil, once it had cooled down, to solidify (Stanfield 2008). He used his discovery of hydrogenating vegetable oil to produce cheap candles (Stanfield 2008).

The multinational consumer goods company Proctor & Gamble (Proctor & Gamble 2010) purchased the patent for IP-TFs in 1909 for food production uses, and manufactured Crisco shortening in the USA (Stanfield 2010). Crisco was heralded as a wonder food because it did not contain animal fat, had a long shelf life and didn't interfere with other flavours in food (Stanfield 2010). In the following years, Crisco and other TFs became very popular within the food industry and were widely used in food. However, it was not until the 1970s that the health risks associated with TFs began to be discovered (Stanfield 2010).

The advantages of TFs in food

Manufacturers use TFs in food because they are cheap to produce and improve texture and taste. Some types of TFs are used in foods to provide a "smooth creamy texture of a soft fondant coating" (Bell 2006). Other types of TFs can help make cooked food crisp and flavourful (Steinhauer 2008). Thus they had many benefits in food manufacturing, which led to their original success.

The hydrogenation process in the manufacture of IP-TFs makes food ingredients more stable, thus TFs maintain the freshness and prolong the shelf life of food (Bell 2006, Stanfield 2008). Retailers benefit economically from having products with longer shelf lives, as they have a longer period to sell foods, thus reducing the amount of unsold out of date food products that has to be disposed of.

TFs are more stable at high temperatures than other oils used for frying, and so develop off flavours less quickly, thus the oil used for frying can be changed less frequently (Bell 2006). This also provides economic benefits to food producers. TFs revolutionised manufacturing processes, giving an economic advantage to food manufacturers and retailers who used them.

In what foods are TFs found

Any food that has hydrogenated or partially hydrogenated vegetable oil, vegetable shortening or margarine on the ingredients list, contains TF (tfX 2010¹). Foods likely to contain TFs include cereals, cakes, biscuits, crackers, confectionary, chips, potato products, fried foods, batters, pastries, pies, canola and rapeseed oils, ice cream and shakes (tfX 2010¹, Maryon-Davis 2010). It can be seen therefore that TFs are very significant ingredients in many everyday food products, making it difficult to substitute or not use them as ingredients.

The health effects of TFs in food

TFs lower “good” or high-density lipoprotein (HDL) cholesterol levels and raise “bad” or low-density lipoprotein (LDL) cholesterol levels in the body (Stanfield 2010, American Heart

Association 2009), which can contribute to heart disease. The US Cohort Study, carried out between 1980 and 1994 on over 80,000 female nurses, showed that substituting 2% of dietary energy from trans unsaturated fats with unhydrogenated unsaturated fats was associated with a 53% reduction in risk of coronary disease (95% confidence interval, $P < 0.001$) (Hu et al 1997 p 1496). The study also showed that TFs are more damaging to the heart and coronary arteries than saturated fats (Hu et al 1997 p 1496). The European Food Safety Authority issued a statement in early 2005 saying that weight for weight IP-TFs could be more harmful than saturated fat (Bell 2006). Thus it can be seen that IP-TFs can seriously damage health if a person's diet contains high levels of them.

In April 2006, research by Mozaffarian et al showed a 2% increase in TF intake was associated with a 23% increased incidence of coronary heart disease (CHD) (Mozaffarian et al 2006 p 1605). This meta-analysis found lower associated risks of TF consumption and CHD than Hu et al's study, but still provided strong evidence for governments worldwide of the dangers of 2% of dietary energy intake coming from TFs.

CHD is linked to heart attacks, medically known as myocardial infarctions. Heart attacks are one of the leading causes of death in England, with estimated figures of 111,000 people having a heart attack every year (NHS 2010). Chest pain, caused by angina affects as many as 3% of the UK population (BBC 2003). The cost of CHD to the National Health Service (NHS) in 2004 was £16 billion, with 69 million work days lost, costing the UK economy an estimated £3 billion (BBC 2006). If reducing or eliminating IP-TFs in the diet of the UK population could lead to a reduction in CHD, the savings to the NHS and economy could potentially be huge.

TFs are also associated with obesity, insulin resistance and Type 2 diabetes (Stanfield 2008). A study by Morris et al published in 2003 concluded high intakes of saturated fat and TF were positively associated with the risk of developing Alzheimer disease (Morris et al 2003 p 198). There has also been some research showing an association between TFs and inflammatory diseases, and infertility (Stanfield 2008). Again, if TFs were reduced in the population's diet, vast savings to the NHS and economy could follow.

There is disagreement amongst scientists as to whether there is an association between the intake of TF and the risk of developing cancer. A US study by Chavarro et al published in April 2006, found an association between TF intake and increased risk of non-invasive prostate cancer in men (Chavarro et al 2006). The American Cancer Society (ACS) has information on its website, approved in May 2006 and updated in March 2008, saying the relationship between TF and cancer risk "has not been determined", but advises people to "eat as few TFs as possible" (ACS 2008).

A study by Chajès et al published in February 2008, advised that a high serum level of IP-TFs probably is one factor contributing to an increased risk of invasive breast cancer in women (Chajès et al 2008 p 1312). It is evident that further research needs to be undertaken so that national organisations such as the American Cancer Society can provide the public with accurate health information regarding TFs and risk of cancer. Ultimately it can be seen that TFs have wide reaching and serious health implications. It is therefore the case that TF limits in foods have been set at an international level.

Safe limits of TFs

The World Health Organisation (WHO) recommended in 2003 that TF consumption should not exceed 1% of total energy intake (WHO 2003). The American Heart Association (AHA) published identical guidance in June 2006 (AHA 2010). For the average person who eats 2000 calories per day, this means he/she should consume less than 2 grams of TFs per day (AHA 2010). For example, at McDonald's restaurants in New York City in April 2006, prior to TF regulations, a meal of chicken nuggets and a large portion of fries contained over 10 grams of TFs (Associated Press 2006¹), more than five times the recommended daily maximum. The amount of TF is, however, variable in each country and restaurant according to oils used in cooking, as well as whether that country has adopted legislation on TFs.

Dr Maryon-Davis, President of the UK Faculty of Public Health, stated in January 2010 that "there is no safe level" of TFs in the diet (Maryon-Davis 2010). To eliminate IP-TFs completely from our diet would require manufacturers, retailers and food outlets to reformulate products and change cooking oils. This would be at considerable cost, and would be likely to reduce manufacturers and retailers profit margins at first. Would this happen without legislation? TF legislation is an issue that is currently being considered in the EU, following legislation in several nations.

DISCUSSION

WHY HAVE SOME AREAS IMPLEMENTED LEGISLATION ON TFs?

Denmark was the first country to legislate against TFs in food, with Switzerland following its lead. Some states in the US then passed similar legislation. What follows is a discussion and in depth analysis exploring the reasons how, the motives why and backlash that then occurred when these countries and states took the move to try to protect their citizens from the health implications associated with TFs. The discussion will then proceed to examine TF policy in the UK, using a case study to demonstrate key factors in the debate.

Legal policy in Denmark

Denmark passed a law in 2003, which came into effect in January 2004, making it illegal for any food to contain higher than 2% of TFs (Associated Press 2006²). It became the first country in the world to regulate the sale of TFs in foods (CBC News 2008). The passing of the TF law in 2003 came about after ten years of work by the Danish Nutrition Council (DNC) following the publication of a study by Professor Willett et al on 6th March 1993 in the Lancet, one of the world's leading medical journals (L'Abbé et al 2009).

Willett et al's study concluded:

“Our findings must add to concern that the practice of partially hydrogenating vegetable oils to produce solid fats may have reduced the anticipated benefits of substituting these oils for highly saturated fats, and instead contributed to the occurrence of CHD” (Willett et al 1993 p 585).

A press release about the study stated that women who ate four or more teaspoons per day of margarine had a 50% increased risk of CHD (L'Abbé et al 2009, Astrup 2006 p. 44). Arne Astrup, Chairman of the DNC from 1992-2003, commented on 7th March 1993 on the midday Danish radio news that “the health benefit of margarines may have been overestimated” (Astrup 2006 p 44). Denmark consumes high levels of dairy products, thus the study's conclusion made front-page news in many large Danish newspapers, with headlines such as “Butter more healthy than margarine” (L'Abbé et al 2009). The TF issue, which had been of scientific concern, became hyped by the media and became a huge public concern in Denmark.

The next day the DNC held an emergency meeting on IP-TFs, reported on by all the Danish media on 8th March 1993, with headlines such as “Emergency meeting on margarine hazard” (L'Abbé et al 2009, Astrup 2006 p 44). The DNC concluded that as there was no evidence whatsoever of any health benefits from an intake of IP-TFs, and some non-robust evidence that IP-TFs are more harmful than saturated fatty acids, the primary consideration should be the protection of public health (Astrup 2006 p 44). This sudden recognition of the serious health implications of IP-TFs was of major importance to the Danish population whose diet is high in IP-TFs.

It followed that the DNC set up a working group to write a scientific report on IP-TFs and their effects on health (L'Abbé et al 2009). The first of 3 reports was produced in 1994 and concluded that health concerns were well founded. The strongest evidence related to IP-TFs causing coronary heart disease, but there was also some evidence that IP-TFs harmed development in utero (L'Abbé et al 2009). The DNC urged Danish margarine producers to

produce products without IP-TFs, and they responded positively, producing zero-TF margarines (L'Abbé et al 2009). The DNC also advised Danish authorities to ask the European Union (EU) to consider compulsory labelling of prepackaged foods to show the IP-TF content (L'Abbé et al 2009). However the EU's Scientific Committee decided there was insufficient evidence to mandate labelling (L'Abbé et al 2009).

The second DNC report was published in 2001, and the third report in 2003, and contained further evidence of the damaging effect of IP-TFs on CHD (L'Abbé et al 2009). The 2001 report analyzed IP-TF levels in 43 popular fast food products, and concluded that daily IP-TF consumption would be in excess of 30g/day if people were to consume fast foods (L'Abbé et al 2009). This prompted the DNC to recommend a legislative ban on any foods with greater than 2% content of IP-TFs in the oils or fats used, from 1st June 2003 (L'Abbé et al 2009). This legislative ban was possible in Denmark because the DNC had prepared the public, media and food, fats and oil industry for this legislative ban for the proceeding 10 years (L'Abbé et al 2009).

Objections to Denmark's ban came only from other countries in the European Union, who argued that they would be economically disadvantaged as their foods would not be able to be legally imported into Denmark (Associated Press 2006²). No food scientist or expert in Denmark defended IP-TFs, and no producer of margarine objected publicly to the ban (L'Abbé et al 2009). Many politicians regarded the ban to be reasonable as it was an artificial substance that was suspected strongly of being damaging to health (L'Abbé et al 2009).

There was a significant spill over effect of reduced IP-TF content in foods sold or produced in the neighbouring Scandinavian countries of Sweden, Norway and Finland, despite these

countries having no specific legislation regarding IP-TF levels in foods (L'Abbé et al 2009). It is interesting that these three countries reduced IP-TF content without legislation, yet the UK did not follow. Perhaps this is because Scandinavian countries support each other and are more closely linked.

The European Commission, the executive body of the European Union, initiated legal proceedings in 2005 against Denmark for its 2003 rules limiting the content of TFs to 2% in food, claiming these infringed the European treaty (FVM 2008). The European Community treaty 2002, article 28, prohibits the imposition of “quantitative restrictions on imports...between member states” (Wandall 2008 p 3572, Consolidated Version of the Treaty Establishing the European Community (CVTEEC) 2002 C325/47). Denmark was the only EU member state to regulate the sale of foods with TF content above 2%, and so was in contravention of the European Community Treaty 2002. However, article 30 of the treaty permits restrictions if they can be “justified on grounds of... protection of health and life of humans” (Wandall 2008 p 3572, CVTEEC 2002 C325/47). The European Commission requested scientific opinion from the European Food Safety Authority (EFSA) examining the evidence of the effect on human health of the consumption of TFs.

BEUC, the European consumers' organization, and other organizations, called on the European Commission in June 2006 to not intervene in the Danish ruling and to instead introduce similar rules throughout the EU (FVM 2008). The European Commission dropped the case against Denmark in 2007 (FVM 2008). To date no legislation has been passed in the EU, but Switzerland (which is not bound by EU regulations, only having trading agreements) followed Denmark's example.

Legal policy in Switzerland

Switzerland was the second country in the world to limit the levels of TFs in foods (Leybold-Johnson 2008, ETH 2008). Legislation was passed after a Swiss study in 2007 revealed nearly a third of a sample of 120 foods tested contained high levels of TFs (Leybold-Johnson 2008). Thus Switzerland used its own research to build legislation.

Swiss regulations came into force on April 1st 2008, limiting IP-TFs to a maximum of 2 grams in 100 grams of vegetable oil or fat (ETH 2008); legislation was equivalent to that passed in Denmark. Food producers had a period of one year from April 2008 to reformulate recipes (Leybold-Johnson 2008). Michael Beer, head of the Food Safety Division of the Federal Office of Public Health, said the Federal Office “was of the opinion that a restriction would make the conditions clear and equal for all food producers and the trade as a whole” (ETH 2008). The reduction in IP-TF levels in Swiss food production was introduced gradually, to minimise effects on producers’ and retailers’ profit margins. Outside of Europe, developments regarding TF legislation were occurring in the United States.

Legal policy in the United States

Legislation requiring mandatory TF labelling has been implemented in the US on a nationwide basis. Legislation regarding restrictions on levels of TFs served by food facilities and goods baked by retailers has been implemented on a city and state basis, rather than nationally. New York City was the first US state to ban the use of TFs in amounts greater than 0.5 grams per serving in restaurants (Lueck & Severson 2006). Several states and cities

followed New York City's lead in banning TFs in restaurants, including Boston, Philadelphia and Washington (Resnik 2010 p 27). California was the first US state to ban artificial TFs in retail baked goods, as well as restaurant foods. What follows is a discussion about policy measures implemented by specific US states, analysing why only some states imposed measures on IP-TFs.

Nutrition panels on food packaging in the US

The Food and Drug Administration (FDA) announced in July 2003 that it would be a mandatory requirement from 1st January 2006 for food manufacturers to list the amount of TF on Nutrition Facts panels and some Supplement Facts panels on food packaging (FDA 2010). Consumers are given information on saturated fat, TF and cholesterol levels, in grams, in food (FDA 2010). However FDA regulations say, "if a serving contains less than 0.5 gram (of TF), the content, when declared, must be expressed as zero" (FDA 2003). This prevents consumers from knowing exactly which foods contain low levels of TFs, and avoiding them if they so choose. In addition the FDA decided on food labels to leave blank the % daily value for TFs, and not to include an asterisk with a footnote saying "intake of TF should be as low as possible" (FDA 2003). The online US campaign "Ban TFs" states on its website that the FDA had planned to include this warning on labelling, but it was dropped because of food industry pressure (Ban TFs 2010).

The Washington-based group called the "Center for Consumer Freedom" (CCF) lobbies against public health campaigns, and is funded primarily through donations from big food companies such as Coca-Cola (Voiland 2008). Richard Berman is the Executive Director of the CCF (Berman 2006). The website "Berman Exposed" hosted by Citizens for

Responsibility and Ethics in Washington (CREW) says “each year, Berman, using his front groups (such as the CCF) to spread misinformation, spends millions of dollars distracting the public with misleading ads” (CREW 2009).

The FDA estimated the requirement for the TF level to be listed on food packaging would cause a one-time cost to industry of between \$140 to \$250 million (Crawford 2005). This cost would include determining the amount of TF, relabelling costs to include TF, and the voluntary reformulation of food products to lower the amount of TF (Crawford 2005). If the FDA estimated TF labelling cost figures are accurate, it poses the question of why food industry companies donate so much money to organisations such as CCF, when they could be using this money to reformulate their food products to reduce levels of TFs, or eliminate their use completely. Even under such pressure from lobby groups, New York City took pioneering steps in the US to move towards reducing TFs.

Legal policy regarding restaurants in New York City

On December 5th 2006, the Board of Health in New York City approved a ban on all but tiny quantities of TFs, and imposed this ban in two stages (New York City Department of Health and Mental Hygiene (NYCDHMH) 2010). From 1st July 2007, food service establishments were prohibited from using oils, shortening and margarine containing 0.5 grams or more of IP-TFs per serving (NYCDHMH 2010). From 1st July 2008, all foods served by restaurants across New York City had to contain less than 0.5 grams of IP-TFs (Lueck & Severson 2006, NYCDHMH 2010). California followed New York City’s lead, but went a step further.

Legal policy in California

California became the first US state, in July 2008, to legislate against artificial TFs in food (Steinhauer 2008). Under this legislation, artificial TFs were banned from restaurant foods from 1 January 2010, and will be banned from all retail baked goods by 1st January 2011 (CCDEH 2010 p 1, Steinhauer 2008). Any Californian businesses classified as “food facilities” had to cease using TFs at levels greater than 0.5 grams per serving (CCDEH 2010 p 1, Steinhauer 2008). In addition, food facilities have to keep the labels on their cooking products for “as long as the food or food additive is stored, distributed, served or used in the preparation of food within the food facility” (CCDEH 2010 p 4), so that inspections of products for TFs can take place (Steinhauer 2008). Violators of the ban can be fined from \$25 for a first offence, up to \$1000 for subsequent violations (CCDEH 2010 p 2, Steinhauer 2008).

The legislation was opposed by the California Restaurant Association (CRA), who said the mandate would be costly as there were fewer distributors of alternative oils that did not contain artificial TFs, and these costs would be passed on to consumers (Steinhauer 2008). The CRA also argued that legislation should be the remit of the federal government, not individual states (Steinhauer 2008). The CRA has not challenged the TF law, as rising consumer awareness has led to public demand for restaurants in California to eliminate TFs from menus (Steinhauer 2008).

Pre-packaged goods, sold or served in the manufacturer’s original sealed package, were exempted from TF legislation, but have to be labelled with the quantity of TF contained in the food product (CCDEH 2010 p 2, Steinhauer 2008). Labelling of TFs in packaged goods is a massive step forward, but still requires consumers to be educated regarding the health risks

of eating foods high in TFs, and be motivated to choose foods low in TFs. So what has been achieved in the US?

The effects of legislation in the US

A study by Niederdeppe and Frosch, published in 2009, concluded that mandatory labelling of TF content in products led to a reduction in US consumers' short-term purchasing patterns of groceries containing TFs (Niederdeppe & Frosch 2009). The 2009 Food and Health Survey of over 1000 Americans aged over 18, found 57% of Americans who looked at the Nutrition Facts panel said they used the TF information provided (International Food Information Council Foundation 2009). This demonstrates a need for further public education campaigns about TFs in order for more people to be aware of what they are eating and use the information provided on labels.

Interestingly, if the US Food and Drug Administration imposed a ban across the entire country of foods containing more than 0.5 grams of TF per serving, it would reduce the costs needed for health care. It would also reduce health campaigns to raise public awareness. Furthermore, it would help Americans meet the target set by The American Heart Association (AHA) for individuals to consume TFs in quantities less than 1% of their total daily calories (AHA 2010).

The FDA estimated in 2005 that by 2009 (3 years after the introduction of TF labelling), annually labelling would prevent between 600 to 1200 cases of coronary heart disease and 250-500 deaths per year in the United States (Crawford 2005). There have been no studies prior to March 2010 in the US regarding the effects of banning TFs (Resnik 2010 p 28). If

such research were carried out, and if it proved the benefits of banning TFs, this might lead to FDA legislation that would affect the entire country, with possibly other countries following the US's lead. With some states in the US banning IP-TFs, why is it that the UK still has not committed to this?

Legal policy in the UK

There is no requirement in the UK for food manufacturers to list TFs on ingredient labels (Maryon-Davis 2010). Currently in the UK there is only a voluntary agreement that has been adopted in 2006 by the British Retail Consortium (BRC), which represents 85% of food retailers, to phase out TFs as an ingredient in retailers own-brand products by January 2008 (Maryon-Davis 2010, British Heart Foundation (BHF) 2010 p 5). The Food Standards Agency reported BRC members had, by October 2007, reformulated nearly 7000 food products to remove IP-TFs (FSA 2007 p 21). However, for supermarkets such as Tesco or Sainsbury, "own brand" products account for less than 10% of all food products sold (Stanfield 2008). The voluntary agreement adopted by the BRC does not cover imported foods (Maryon-Davis 2010).

The voluntary agreement adopted by the BRC has no sanctions for retailers who are slow to act (Maryon-Davis 2010). With the additional costs of reformulating the food product, and potentially using a more expensive alternative ingredient rather than TF, there is little incentive for retailers to act. The UK Faculty of Public Health would like to see TFs banned in the UK, in line with other countries worldwide (Maryon-Davis 2010). However, this has not happened.

In 1994 the Department of Health published the report “Nutritional Aspects of Cardiovascular Disease”. It was produced by the Committee on Medical Aspects of Food and Nutrition Policy (COMA), which became the Scientific Advisory Committee on Nutrition (SACN) in 2001 (SACN 2005, tFX 2010²). The 1994 COMA report (quoted by SACN 2007 p 1) concluded that there was

“sufficient evidence for an association between TF intakes and CHD...to recommend that the average population intake of TFs should not exceed 2% food energy” (SACN 2007 p 1)

The 1994 COMA report was the basis for UK dietary advice on TF intake in 2007 (SACN 2007 p 1). Thus thirteen years after the Department of Health had acknowledged a serious health implication from dietary IP-TFs, there was no legislation regulating IP-TFs in the UK. During Parliamentary Answers on 28th March 2006, Caroline Flint, then Parliamentary Under-Secretary of State to the Department of Health said “No assessment has been made of the feasibility, costs or health benefits related to placing a legal maximum on the occurrence of TF in foods, and there are currently no plans to make such assessments” (Flint 2006).

Following legislation in Denmark and New York, the Secretary of State for Health, Alan Johnson, made a written request in 2007 to the Chair of the Food Standards Agency (FSA), Dame Deidre Hutton, to carry out a review of TFs (FSA 2008). The Secretary of State for Health wanted the FSA to analyse two options – maintaining the current voluntary approach, or introducing mandatory restrictions on TFs in foods (FSA 2007 p 1).

The FSA recommendation was agreed in January 2008 that the voluntary approach to reducing TFs be maintained (BHF 2010 p 4). The FSA found evidence to support a moderate effect of TFs on the risk of developing CHD, but insufficient evidence linking TFs to other diseases such as diabetes, obesity and cancers (such as colorectal, breast, prostate and non-Hodgkin's lymphoma)(FSA 2007 p 1 & 37). It is interesting that a moderately increased risk of CHD alone did not prompt the Department of Health to act.

The Office of Fair Trading (OFT) report "The competition impact of environmental product standards", published in October 2008, said:

"Policy makers are currently engaging industry to understand what combination of mandatory limits and voluntary labels could help lower the...fat content in food, while health and safety regulations must trade off the greater certainty of mandatory standards with the potentially lower costs of voluntary agreements" (OFT 2008 p 5).

The report went on to say:

"Enforcement (of policy) requires a framework which can detect compliance with the agreement, and sufficient sanctions for non-compliance. By contrast, voluntary agreements require all firms to have incentives to continue to comply. Agreements will fail if some firms are better off not taking part. " (OFT 2008 p 9).

Inter-firm competitive pressure should "create incentives for firms to invest in research or more expensive production processes" as customers respond by buying TF-free foods, or foods with low levels of TFs, generating extra sales for firms that have made these investments (OFT 2008 p 36). Mandatory labelling of TF content in foods would enable concerned consumers to identify which products they should be avoiding. It is likely that if

labelling legislation were passed in the UK, consumers would purchase fewer products containing TFs, a pattern Niederdeppe & Frosch demonstrated happened in the US.

Labelling would also enable consumers to calculate how much TF they are consuming. I believe the US system of labelling foods with less than 0.5 grams of TF per serving as having zero TF to be dangerous. If people eat several “zero TF” foods that contain small amounts of TFs in a day, they could be eating more than the recommended level of 2 grams of TF per day. It is imperative that should UK labelling be introduced, it accurately reflects the amount of TF in foods.

Compulsory labelling of TF content could be applied to all food products sold in the UK using one of two approaches: listing total TF content, which consumers may find hard to understand; alternatively a traffic light system could be used, with red for products with greater than 2% of TF content, amber for 1-2%, and green for less than 1%. The labelling approach requires public education, and as shown from US research, only 57% US consumers took notice of the labelling. The FSA’s annual Consumer Attitudes to Food Standards Survey revealed 20% of UK consumers were concerned about TFs in 2007 (FSA 2007 p 51). This low figure indicates to me that there is a need for the UK government to bring in laws similar to those in Denmark and New York City.

Taxation of high TF content foods could provide an incentive to food manufacturers and retailers to reduce TF content in foods, and help to pay for education campaigns. However, imposing mandatory legal limits in the UK of 0.5 grams of TF per food serving would negate the need for public education and affect 100% of consumers.

If a ban on TFs was mandated in the UK, care should be taken by food manufacturers to not replace TFs with other saturated fats, which are also harmful to health. When the composition of foods is being redesigned to meet targets on TFs, consideration should be given to reducing the overall fat content of food.

The FSA estimated the average UK intake of TFs to be 1% of food energy, which is half the 2% maximum recommended average intake suggested by SACN (FSA 2007 p 1). This figure was taken from the TRANSFAIR Study which brought together data from pre-existing national surveys done in 14 Western European countries between 1980-1996 (FSA 2007 p 24). Data for the UK was collected in 1996, but there has been a rise in the consumption of convenience and fast foods since 1996, with continued expansion of fast food outlets even in the recession of 2009 (Fast Food Nation 2010).

In addition, researchers find it difficult to accurately measure IP-TF intake using dietary questionnaires and nutrient databases, the latter of which are often incomplete and often have inaccurate estimations of TF content of foods (Chajès et al 2008 p 1318). Subsequently, Chajès et al called for a “comprehensive evaluation of the public health effect of TFs”, and said this research should be carried out “in populations with diverse dietary practices” (Chajès et al 2006 p 1318), such as in the UK.

The British Heart Foundation (BHF) also released a policy statement in January 2010 calling for the FSA to collect robust data on UK TF consumption that does not rely on mean averages (BHF 2010 p 1). They requested data be collected “on actual consumption amongst different groups in the (UK) population” as this “will help to identify and tackle possible health inequalities arising from variations in intake of TFs” (BHF 2010 p 1).

Regardless of which policy instrument was chosen, namely labelling or a mandatory standard, independent assessors would have to check TF levels in food against manufacturers and food outlet retailers' claims. Consideration would have to be given to who could implement policy most effectively.

Oliver Tickell, a health campaigner for the ban of TFs, and founder of tfX, the UK campaign against TFs in food, succinctly wrote in response to Clarke & Lewington's editorial in the British Medical Journal (BMJ), "many people do not read food labels, understand nutritional information or act on the information provided" (Tickell 2006). He argued the UK government should act in the public health interest of the UK population by limiting trans fat levels in food, saying:

"Most of the TF many people eat is not in packaged food at all, but in unpackaged baked goods, pub and restaurant food, and take-away/fast food. These unpackaged foods are not subject to any labelling requirement and as such will be unaffected by a labelling regulation...the only truly effective solution is to impose legal limits on TF" (Tickell 2006).

The European Parliament will debate Food Information Regulation later in 2010, and this may have a new provision making it mandatory for information on TFs to be stated on food labels throughout the European Union (EU)(BHF 2010 p 3). The independent UK organisation, the National Institute for Health and Clinical Excellence (NICE), are currently developing guidance on cardiovascular disease prevention (BHF 2010 p 5). NICE's draft guidance recommends a ban on IP-TFs across the EU, and for consumption of IP-TFs to be reduced to less than 1% of dietary intake (BHF 2010 p5).

Policy has been effective in Denmark, Switzerland and California, despite the cost to the food industry to implement TF regulations. So why has no legislation been passed in the UK? It is likely that in the UK the crux of the matter is cost to industry. Smaller companies would have to shoulder a proportionately higher cost to reformulate and re-label food products than large companies. To explore this further I shall examine the retailer Marks and Spencer's response to the scientific community's and customers' concerns regarding TFs as a case study, to illustrate what measures can be taken by a large retailer.

CASE STUDY: Marks and Spencer's response to the problem of TFs

Marks and Spencer (M&S) became the first UK retailer to completely ban the use of IP-TFs in all their foods from 31st March 2006; longer shelf-life products such as frozen products produced before this date remained in store, but M&S food was totally free of IP-TFs by January 2007 (M&S 2010¹, Bell 2006). Sue Bell, M&S's Technical Manager for Health and Policy Development, said M&S have "strong supply chain partnerships allowing us to anticipate trends and respond quickly to issues as they arise" (Bell 2006). M&S has stores in over 40 countries worldwide (M&S 2010²), and in the UK currently 51% of their business is in food (M&S 2010³). M&S had a UK food turnover of £4.2 billion in 2009 (M&S 2009).

The "tipping point" for M&S's change in food policy regarding TFs came in 2005 after the European Food Safety Authority issued the statement regarding TFs being potentially more harmful than saturated fat (Bell 2006). Increased scientific and customer concerns caused M&S's Chief Executive, Stuart Rose, to publicly commit in 2005 to M&S removing TFs from

their foods (Bell 2006). A team of product developers and food technologists worked with over 250 suppliers to reformulate the recipes of food products (Bell 2006). M&S took the approach of reducing saturated fat levels in their products, as well as removing TFs, “to ensure we were being as robust as possible and not taking out one ‘bad’ fat and replacing it with more of another ‘bad’ fat” (Bell 2006).

Strategic market planning was probably at the forefront of M&S’s decision to ban TF in their food products. Brand image of healthy high quality food is important and M&S pride themselves on having “a reputation for taking a lead on issues such as food safety and health, and have come to be trusted for this by customers” (Bell 2006). M&S consumers are more likely to be from upper-middle class groupings, due to its “premium pricing strategy” which is set at a level accessible to more affluent customers (Consume UK 2004). Research has shown that people in higher socio-economic classes consume lower quantities of IP-TFs than those in lower classes (Bolton-Smith et al 1995 p 666). M&S’s consumers have more financial freedom to buy products according to health and nutritional knowledge than those in lower socio-economic classes who are more influenced by low cost. I argue that UK consumers in all socio-economic classes should be buying TF free products in whichever supermarket they choose to shop in.

CONCLUSION

Since 1994 there has been much scientific, government and public review on the issue of TFs because of their potential health risks. Mounting scientific evidence has shown the potential dangers connected with consuming large amounts of TFs. However, only Denmark, Switzerland and some states in the US have enforced legislation to reduce the risk of TFs on their citizens.

Mass media pressure, independent research on TFs and a very high butter intake consumed by its population, appeared to provide the Danish government the evidence and support they required to boldly reduce the amounts of TFs in their food. However, their journey to do so was not straight forward experiencing a backlash from the European Commission in response to the economic implications on food trading manufacturers.

Switzerland followed suit, trying to protect their population from the health risks associated with TFs. They used their own research, and were not closely tied to the EU so did not come under EU trading restrictions. This perhaps independently allowed them to make the change to their law regarding TFs in food, as well as potentially reaping the economic long-term benefits of a healthier population and thus less resources being spent on health.

The experiences of these countries seem to contrast with that of the US, where states have come under the pressure of lobby groups not to impose legislation on TFs. Indeed, the CCF lobbied against public health campaigns nationally, and the CRA challenged TF legislation in the state of California. However, some states have recognised the health implications and potential health service benefits to imposing some sort of legislation on TFs.

The UK is still to set legally binding legislation on TFs, perhaps because of concern about possible reactions from the European Commission, possibly mirroring that of Denmark. The UK is probably waiting for the forthcoming European Parliament regulatory debate, before committing to banning TFs in foods . Furthermore, NICE guidance, specific to the UK, has yet to be approved, making it unlikely that the government would act without full evidence and projected National Health Service cost advantages. Interestingly, unlike in the USA, there appears to be no evidence to suggest that the UK is under pressure from food industry lobby groups to not impose TF regulations. Indeed, the BRC's positive attitude to voluntarily reducing TFs in foods has been encouraging. However, voluntary agreements have not led to the shift required by manufacturers and retailers to eliminate IP-TFs from all UK food products, so they still pose a health threat. Thus, the UK government needs to enforce legally binding principles to protect the long term health of the population,

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