Evaluating mandatory restrictions on trans fatty acids

An analysis of the impact of New York City policy to restrict the use of trans fat for human consumption shows a significant fall in the trans fat content of fast food purchases, without a commensurate rise in the level of saturated fat.

Overview: Trans fatty acids occur naturally in dairy products and some meats. They are also formed artificially during industrial hydrogenation of oils. Fats containing industrially produced trans fatty acids are solid at room temperature, have some technical advantages in food processing, and prolong the shelf life of food. However, human consumption poses a significant risk to health.

A meta-analysis of 4 large prospective studies found that an intake of trans fatty acids corresponding to 2% of the total energy intake (approximately 5 g/day) was associated with a 23% increase in the risk of coronary heart disease (Mozaffarian et al. 2006).

New York City in the USA, and countries Denmark and Austria have imposed mandatory restrictions on the use of trans fatty acids in food products. In the UK, manufacturers and caterers are encouraged by the Food Standards Agency to reduce the use of these fats, however, this action remains voluntary.

Current advice: Trans fats make up 1% of food energy in the UK, which is half the maximum recommended by the Scientific Advisory Committee on Nutrition.

However, although consumption across the population as a whole may be well below the maximum, those who regularly eat fried fast-food may be consuming a substantially higher amount than average.

For health reasons NICE recommends the elimination of industrially-produced trans fatty acids for human consumption. NICE guidance on prevention of cardiovascular disease recommends that local and national conditions should also support a reduction in the amount of industrially-produced trans fatty acids in foods, while ensuring levels of saturated fat are not increased as a substitute. Instead, the use of vegetable oils high in polyunsaturated and monounsaturated fatty acids should be encouraged, to replace oils containing industrially-produced trans fatty acids.

New evidence: In 2008, New York City brought in a regulation restricting all food service establishments from using, storing or serving food that contains partially hydrogenated vegetable oil and has a total of 0.5 g or more trans fat per serving. Federal regulations allow products that contain up to 0.5 g of trans fat to be labelled as containing 0 g of trans fat.

To evaluate the effect of the regulation, a cross-sectional before and after study compared trans fat, saturated fat, and trans fat plus saturated fat content, in lunchtime food purchases intended for individual consumption, across 11 national restaurant chains at 168 locations in New York City (Angell et al. 2012). The study sample totalled 14,854 purchases (6969 from 2007 and 7885 from 2009).

Between 2007 and 2009, mean trans fat content per purchase fell by 2.4 g (2.9 vs 0.5 g; 95% CI, -2.8 to -2.0 g, p<0.001). Mean saturated fat increased by 0.55 g (10.9 vs 11.4 g; 95% CI 0.1 to 1.0 g,
Mean trans plus saturated fat content decreased by 1.9 g overall (13.8 vs 11.9 g; 95% CI 2.5 to -1.2 g, p<0.001). Over the same period, purchases with trans fat content listed as 0 g increased from 32% to 59%.

The researchers conclude that the introduction of a local restaurant regulation was associated with a significant decrease in the trans fat content of purchases at fast-food chains, without a commensurate increase in saturated fat.

**Commentary:** "The research supports the idea that policy interventions can have a powerful and influential impact on consumption of harmful substances, in this case industrial trans fats.

"The wider US policy picture is informative, and heartening. After the New York City ruling, major US restaurant chains faced making technical changes to accommodate the New York City requirements. Many decided that a localised response made no business sense. They instead decided to implement a US-wide trans fat free policy. That made production requirements consistent (and simpler), and also potentially offered marketing advantages over competitors. The consequence is that in US adults, blood levels of trans fats have halved in the last decade. Good news indeed.

"However, Denmark still remains the exemplar. The 1993 Lancet paper by Willet et al. prompted an avalanche of scientific, media, public and political interest in Denmark. This ensured the attention of local food manufacturers and distributors including the local margarine industry. They demonstrated a shrewd philanthropy, responding rapidly. They identified technical solutions to progressively reduce and then eliminate trans fats from an increasingly wide range of food products. This was followed by wider policy debates. However, the supporting legislation to eliminate industrial trans fats was not actually implemented until 2003. Industrial trans fat consumption had already fallen substantially by then, before being virtually eliminated within 2 years. Other European countries have now emulated this regulatory success, including Austria, Switzerland and Iceland: others may follow.

"Limitations to this study are obvious but understandable. Intervention randomisation was not possible. Some New York City residents may rarely use restaurant chains, hence a degree of selection bias. The ideal study would quantify comprehensive dietary consumption in randomised samples of New York City residents. Other powerful dietary factors could then be considered, such as consumption of saturated fat, salt, sugars, fruit and veg, along with consideration of the broader environment (food providers other than chain restaurants, healthy alternatives, differential pricing or tax policies, marketing restrictions etc)." – Simon Capewell, Professor of Clinical Epidemiology, University of Liverpool