

Health impact of high fat, sugar and salt (HFSS) foods

Purpose: Short review of key published research as part of a set of three evidence reviews of HFSS foods to inform the development of marketing of food and drink. This paper summaries current evidence on the link between consumption of HFSS foods and increased risk and incidence of certain diseases such as type 2 diabetes, cardiovascular disease, certain cancers as well as contributing to high levels of obesity both for children and adults.

What are healthy levels of consumption?

Food Standards Agency (FSA) guidelines state adults should eat no more than 6g of salt a day – that's around one full teaspoon. Children 10 years and under should eat less (1).

The FSA recommendations for fat and sugars at population level (5yrs and over) are¹:

- Saturated fat – no more than 11% of food energy
- Trans fat: no more than 2% of food energy
- Total fat: no more than 35% of food energy
- NMES (added sugars) – no more than 11% of food energy

What are the current levels of consumption?

The UK National Diet and Nutrition Survey (NDNS) reports that on average the population consumes too much saturated fat, non-milk extrinsic sugar (added sugars) (2). The key findings from 2008/09 – 2010/11 state:

- Mean intakes of saturated fat exceeded the recommended level in all age groups. For example, mean saturated fat intake for adults aged 19 to 64 years was 12.7% food energy
- Mean intakes of trans fat provided 0.7% of food energy for children and adults aged 19-64 years and 0.8% for adults aged 65 years and over, thereby not exceeding the guidance threshold level².
- Mean intakes of NMES exceeded the recommended level for all age groups, most notably for children aged 11-18 years where mean intakes provided 15.3% food energy.

The NDNS reports that while on average the UK population consumes about the right amount of total fat (not more than 35% of food energy intake), the highest consumers of fat are eating close to 50% of their energy as fat, far higher than recommended amounts (1).

Currently, most people consume too much salt. In the Scotland the mean salt intake was 8.8 g/day, with a mean of 10.0 g/day among men and 7.8 g/day among women. Overall, 75% of the population had a daily intake higher than the recommended 6g/day (89% of men, 72% of

¹ Saturated fat is found in butter and lard, pies, cakes and biscuits, fatty cuts of meat, sausages and bacon, and cheese and cream. Trans fats can be formed when oil goes through a process called hydrogenation, which makes the oil more solid. This type of fat, known as hydrogenated fat, can be used for frying or as an ingredient in processed foods. Industrially-produced trans fatty acids (IPTFAs) constitute a significant health hazard and there for consumption levels should be regarded as guidance threshold levels for adverse health risk.

(<http://www.nhs.uk/LiveWell/Goodfood/Pages/Goodfoodhome.aspx>)

² Although the population mean consumption of trans fat is under the threshold level, there are groups within the population who are consuming more (for instance, those who regularly eat fried fast-food) and these people may be already more likely to be at risk of cardiovascular disease. A recent NICE review highlighted the need to consider removal of trans fats in the UK. <http://www.nice.org.uk/nicemedia/live/13024/49273/49273.pdf>

women), compared with 85% of men and 65% of women exceeding the 6g/day of salt target in 2006 (3).

The Diet and Nutrition Survey of Infants and Young Children (DNSIYC) Scotland reports mean daily intakes of salt were only 79% of the Reference Nutrient Intake (RNI) for children aged 4 to 6 months, but increased to 203% for children aged 12 to 18 months. This equates to an intake of 2.5g salt per day for children aged 12 to 18 months, exceeding the population goal for this age group of no more than 2g salt per day(4)³.

The Survey of Diet Among Children in Scotland 2012 reported that children exceeded the recommended level for NMES (no more than 11% of food energy). For children aged 3-16yrs reported that between 2006 and 2010, mean NMES intake decreased from 17.4% to 15.6% food energy. The largest decrease occurred in 12-17 year olds (19.1% to 16.6% food energy) although this is still above the recommended level and is higher in Scotland than in the rest of the UK (15.3% for this age group). The survey also reported main contributors to NMES intake were non-diet soft drinks (16%), confectionery (13%), biscuits, cakes & pastries (12%), yoghurt & fromage frais (7%) and fruit juice (6%) (5).

The Survey of Diet Among Children in Scotland 2012 also reported mean total fat intake of 32.7% food energy was below the UK recommended population average of 35% food energy, and was similar to the mean intake of 32.9% in 2006. Mean saturated fat intake of 13.2% food energy however was above the recommended level of 11% food energy in all age and sex groups, and was similar to the mean intake of 13.8% in 2006 (5).

What are the health impacts of overconsumption?

It is well established that a poor diet (including high in fats, sugars and salt) is associated with increased risk of cardiovascular disease and some cancers (stomach and colorectal) (6). A person with high salt levels is at risk of raised blood pressure which increases the risk of heart disease and stroke (7). A systematic review concluded that there is a relationship between increased salt consumption and subsequent risk of cardiovascular disease (8).

Controlled trials and observational studies provide conclusive evidence that consumption of trans-fatty acids from partially hydrogenated oils adversely affects multiple cardiovascular risk factors and contributes significantly to increased risk of cardiovascular health events (9).

Excessive consumption of sugar has been linked to several metabolic abnormalities and adverse health conditions including diabetes and cardiovascular disease (10,11). The link between excess intake of sugar and obesity is more contentious as it is difficult to isolate individual contributing factors, although there is new evidence that intake of free sugars or sugar sweetened beverages is a determinant of body weight (12). The most consistent association has been between a high intake of sugar sweetened drinks and the development of obesity (13,14) and increased risk of type 2 diabetes (15)⁴.

³ Infant formula was the main contributor to sodium intake for children aged 4 to 6 months (50%) and 7 to 9 months (26%) followed by the food group 'commercial infant foods' (18%) for children aged 4 to 6 months and 'cereals and cereal products' for children aged 7 to 9 months (18%). The food group 'cereals and cereal products' was the main contributor for children aged 10 to 11 months (24%) and children aged 12 to 18 months (31%). The second largest contributor to sodium intake was the food group 'milk and milk products' for children aged 10 to 11 months (15%) and 12 to 18 months (20%).

⁴ Frequency of snacking on sugary food and drinks predisposes adults and children to dental problems (especially important for the elderly, children and adolescents who are at an increased risk of dental caries) (16).

Does a reduction in consumption improve health?

Reducing salt intake reduces blood pressure in adults and children and lowers the risk of cardiovascular disease, stroke and coronary heart disease in adults (17). This is critical because children with elevated blood pressure often become adults with elevated blood pressure. A recent systematic review concluded that reduced salt intake reduces blood pressure and has no adverse effects in adults and children (18).

Studies in children and adults have found that reducing sugary drink consumption can lead to better weight control among those who are initially overweight. One study found decreasing sugary drink consumption in adolescents had a beneficial effect on body weight that was strongly linked with baseline BMI (20). Another study in adults reported that replacement of caloric beverages with non-caloric beverages as a weight-loss strategy resulted in average weight losses of 2% to 2.5% (21).

Reduction in fat intake has also been shown to have an impact on health. A recent systematic review reported lowering total fat intake in adults compared with not lowering fat intake was associated with reductions in body weight, body mass index, and waist circumference with a similar effect in children and young people (19). Based on experience in Denmark, a study reported that, if trans-fat levels could be reduced to approximately 0.5% of total UK dietary energy intake, this would reduce the relative risk of death from cardiovascular disease by approximately 6%. Applying these benefits to the entire England and Wales population would prevent approximately 2700 deaths annually, saving the equivalent of approx. £235m a year (22). This research also reports that legislation or other measures to reduce dietary salt intake by 3g/day would prevent approx. 30,000 cardiovascular events in England and Wales, with a savings worth at least £40m a year.

At UK level, it is estimated that 70,000 premature deaths could be avoided with a healthier diet (23). This may be particularly important for Scotland which has a poorer diet in comparison with England (for example between 2007 and 2009 Scotland consumed 5% more saturated fat and 7% more salt per day). Evidence suggests that if Scotland had adopted a diet equivalent to the English diet then 40% of the excess cardiovascular and cancer mortality would be removed, with over 6,300 deaths delayed or diverted (24).

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