

## Saturated fat consumption

In response to recent debate over saturated fat intake, Diabetes UK joined the Diabetes Specialist Group of the British Dietetic Association to appraise the current evidence and has produced a policy statement on dietary fat intake<sup>1\*</sup>. **Douglas Twenefour**, registered dietitian and Deputy Head of Care at Diabetes UK, reviews the statement, the evidence and the conclusions

The saturated fat debate has been around for quite a while. However, it came under new scrutiny recently, following a systematic review which concluded that the evidence available does not clearly support current cardiovascular (CV) guidelines that encourage high consumption of polyunsaturated fat and low consumption of saturated fat<sup>2</sup>. This article was widely reported and generated much controversy. There was criticism from the research community, and even calls for the paper to be withdrawn. The British Heart Foundation, which had part-funded the review, cautioned against changes to the dietary guidelines. Many wanted to know Diabetes UK's view, which is why the current policy statement has been put together.

### It's complicated

Unsaturated fats (both MUFAs and PUFAs – see box, right) are generally associated with health benefits. There is strong evidence for the adverse effect of industrial trans fatty acids on blood lipid profile and cardiovascular disease (CVD) risk. However, naturally occurring trans fatty acids in dairy and certain animal products are different, and are not deemed to be detrimental to health. In the UK, consumption of trans fats is generally within current guidelines. However, there are certain communities who still consume too much of these fats.

Saturated fatty acids have been identified as a clear concern. But individual SFAs have different physiological effects<sup>3</sup>. For example, myristic acid, found in butterfat, and palmitic acid, found in palm oil, have adverse metabolic effects, and increase the risk of CVD. However, stearic acid, which is found in dairy products, beef, dark chocolate and olive oil, is not thought to increase cholesterol or influence cardiovascular risk. But, how realistically can the information on the risks and benefits of each of the different saturated fats be translated into clear and consistent public health messages that are both easy to understand and practical to implement?

The current advice for the general UK population is to reduce all fats to less than 35 per cent of energy, with the emphasis on reducing saturated fats to less than 10 per cent of total energy. However, there is a practical challenge in adequately explaining such nutrient-based advice without seeming simplistic, because food contains differing mixtures of saturated fats and, also, saturated fats are not eaten in isolation. For any single SFA, therefore, the physiological effects can be complex, with the potential for both benefit and harm.

### Dietary fat – language and definitions

Foods contain a mixture of fatty acids, with no one food being a pure source of any specific fatty acid. For easy communication, conventional public health messages have considered four main types of fats:

- Monounsaturated fatty acids (MUFAs) are mostly found in olive oil, rapeseed oil and walnut oil.
- Polyunsaturated fatty acids (PUFAs) are found in sunflower oil, corn oil and oily fish (these are also known as omega-3 fatty acids).
- Saturated fatty acids (SFAs) are very broadly equated with 'animal fats' (eg in meat and dairy products), but can also be found in palm oil.
- Trans fatty acids (also called hydrogenated fats) are a subgroup of unsaturated fats which include some (but not all) fats that are artificially manufactured by industrial hydrogenation of vegetable oils.

### Looking at the evidence

For dietary studies, the challenge of altering a single variable with interventions consisting of foods that are complex mixes of many nutrients (and non-nutrients) means that recommendations should be made with the necessary caveats. In the real world, long-term randomised controlled trials (RCTs), looking at the effect of one dietary component on hard CVD endpoints, pose many challenges. This is particularly so for SFAs, as they are not homogeneous. Thus, most of the evidence in nutritional research relies on short-term RCTs of intermediate endpoints, such as lipid profile, and from observational cohort studies providing epidemiological evidence.

In considering the evidence to support reduction in saturated fats, it is important to understand whether it is the reduction of SFA *per se* in the diet that might influence future coronary heart disease (CHD) risk, or whether the replacement nutrient related to a decrease in SFA intake matters. For instance, eight RCTs that considered replacing SFA with PUFA did not, individually, find significant effect for CHD events. However, a meta-analysis reported that CHD risk was lowered by 10 per cent for each 5 per cent energy from PUFA intake replacing SFA<sup>4</sup>. Meanwhile, in the largest trial (The Women's Health Initiative), there was no significant

reduction in incidence of CHD or total CVD on reduction of total fat/SFA intake. But here, this reduction in SFA was replaced largely with carbohydrates. This highlights the fact that the replacement nutrient(s) is/are of significance.

Furthermore, a recent Cochrane review, combining both primary and secondary prevention RCTs, concluded that reduction of SFA could reduce the risk of CV events by a modest, but significant, 17 per cent, and that replacement of SFA by PUFA was a useful strategy<sup>5</sup>. Notably, effects were less clear for all-cause or CV mortality, myocardial infarction and for stroke.

The review also found, in subgroup analyses, that reduction in CV events was seen in studies that primarily replaced SFA calories with PUFA, but no effects were seen in studies replacing SFA with carbohydrate or protein. Although this review found that there was not enough evidence to support replacement of SFA by MUFA, a meta-analysis of RCTs conducted in people with Type 2 diabetes has reported positive effects of a Mediterranean-type MUFA-rich diet on both glycaemic control and CVD risk.

Meanwhile, data from general population cohort studies have generally reported similar findings to the RCT evidence. For instance, one review published suggested that replacement of SFA by PUFA (but not carbohydrate or MUFA) prevented CHD<sup>6</sup>. However, a more recent study notes that SFA were not associated with all-cause mortality, CVD, stroke or development of Type 2 diabetes<sup>7</sup>, although the authors reported some limited evidence that SFA may increase the risk of CVD and mortality among people with Type 2 diabetes<sup>8</sup>.

### Low carb diets

Interestingly, there are no studies investigating the specific impact of high SFA diets on glycaemic control in people with Type 2 diabetes. Most evidence is derived from low carbohydrate studies, where the assumption is that lowering carbohydrate increases total fat and SFA intake. Although this is true for the proportion of energy derived from fats, absolute intakes of both total fat and SFA are reduced in the majority of studies, as many processed fatty foods, high in both carbohydrate and fat, are eliminated from the diet. The effects of low carbohydrate diets are therefore unlikely to be related to either higher total fat or higher SFA intake.

### Conclusions

Based on the available evidence, the policy statement concludes that:

- Replacing SFA with MUFA and PUFA reduces the risk of CVD in general populations and in high CV risk populations, including people with Type 2 diabetes.
- When saturated fat intake is replaced by carbohydrates (wholegrain and unrefined only), there is evidence for CV benefit. Substitution with refined carbohydrates appears to increase CV risk. Therefore, it is important to consider both what should be reduced and the likely effect of the substituting nutrients.
- There is no evidence suggesting that an increase in SFA intake reduces CVD risk. Therefore, diets high in SFA should not be recommended.

- Low carb diets that are not high in SFA, Mediterranean-type (MUFA-rich) diets or other evidence-based dietary approaches included in the Diabetes UK nutritional guidelines ([www.diabetes.org.uk](http://www.diabetes.org.uk)) can continue to be recommended in specific cases and under the appropriate dietetic or medical supervision.
- The recommendations relating to fat should be considered within the overall context of a healthy diet; higher in vegetables, fruits, wholegrains, dairy, seafood, pulses, and nuts; lower in red and processed meat; and low in sugar-sweetened foods, particularly sugar-sweetened beverages, and refined grains.

## REFERENCES

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*\*Even though the policy statement specifically looked at the evidence for dietary fat consumption in the management of Type 2 diabetes, the advice to choose foods that have health benefits and to restrict intake of saturated fat is applicable to the population in general and people with all types of diabetes.*