

## Trans Fats – Overview of recent developments

### SUMMARY

'Trans fats' or 'trans fatty acids' (TFAs) are a type of unsaturated fatty acids that have been widely used in the food industry since the 1950s. There is now broad scientific consensus that high consumption of trans fats significantly increases the risk of coronary heart disease (CHD), and may also be associated with increased risk of other cardiovascular diseases, obesity and type 2 diabetes.

The main dietary source of industrial trans fats are partially hydrogenated vegetable oils. The World Health Organization argues that the removal of partially hydrogenated vegetable oils from the food supply would result in substantial health benefits. After determining in June 2015 that partially hydrogenated oils (PHOs) were no longer 'generally recognized as safe' for use in human food, the United States Food and Drug Administration requested food manufacturers to remove them from products by June 2018.

The European Union does not have legislation regulating the content of trans fats in food products or requiring their labelling. Thus, should a product contain partially hydrogenated oils (and hence, possibly TFAs), its label will indicate this, but it will not indicate the exact amount of trans fats present.

Four EU Member States have set legal limits on industrially produced trans fats in foods and there has been growing pressure to establish this as an EU-wide practice. In a report on trans fats published in December 2015, the European Commission concluded that a legal limit for industrial TFA content would be the most effective measure for tackling the problem. Stakeholders have generally welcomed the Commission report, while stressing that thanks to voluntary reformulating efforts by the industry, TFA levels in foods are already quite low.



### In this briefing:

- Background
- Recent developments at international level
- State of play in the European Union
- Stakeholder views
- Other EU actions and outlook
- Main references

## Background

'Trans fats' or 'trans fatty acids' (TFAs) are a type of unsaturated fatty acids. While they occur naturally in some foods, they can also result from heating and frying oil at high temperatures, or be produced industrially.

Naturally occurring trans fats are produced through chemical processes in the stomachs of ruminant animals such as cattle, sheep and goats, and are found in small amounts in their milk and meat.

The main dietary source of industrial trans fats today are those produced by modifying fats or oils – usually vegetable oils such as soybean and cottonseed oil – by partial hydrogenation, where hydrogen is added to the vegetable oil to make it solid or semi-solid at room temperature. This texture makes the oil more attractive for food-producing purposes, as it makes it more tolerant to repeated heating, enhances the texture of processed foods and increases their shelf life. Partially hydrogenated oils contain both saturated and unsaturated fats, including TFAs in variable amounts (from small amounts to more than 50%, according to the production technology used). Partially hydrogenated fats have been widely used in the food industry since the 1950s in products like margarine, ready meals, snack food, breakfast cereals, chips, soup powders, ready-made sauces and cooking oil used for frying fast food. Partially hydrogenated vegetable oils replaced animal fats because they were cheaper, and also because it was believed that they were healthier than the saturated fats of lard or butter. Since the early 1990s, however, there has been growing evidence that industrial trans fats increase the risk of cardiovascular disease.

### Foods that may be high in trans fats:

- frying fat for industrial use
- margarine used in pastry
- pre-packed bakery products, cakes, biscuits and wafers
- microwave popcorn
- deep-fried foods
- soups and sauces.

## Health effects of trans fatty acids

There is now broad scientific consensus that high consumption of trans fats increases the risk of coronary heart disease (CHD) and may also be associated with increased risk of other cardiovascular diseases, obesity and type 2 diabetes. Heart disease is the [leading cause of death](#) in the EU; the [World Health Organization \(WHO\)](#) points to evidence suggesting that trans fats increase the risk of CHD more than any other dietary source of energy (the [risk of dying](#) from heart disease is estimated to be 23% higher when 2% of the daily energy intake is in the form of trans fats). Trans fats contribute to heart disease by raising the levels of 'bad' cholesterol (low-density lipoprotein, or LDL), lowering the levels of 'good' cholesterol (high-density lipoprotein, or HDL) and damaging the cells in the linings of blood vessels, thereby contributing to inflammation and blockage, and ultimately to heart attacks.

There has been discussion on whether ruminant and industrial trans fats are equally harmful to health. While there is some [new evidence suggesting](#) that low levels of industrial TFAs may not be as harmful to health as previously thought, and that trans fats naturally occurring in dairy and meat products may even be beneficial, [another recent study](#) suggests that ruminant and industrial TFAs have similar adverse effects on health. The European Food Safety Authority (EFSA) [concluded](#) in 2010 that TFAs from ruminant sources have similar adverse effects on blood lipids and lipoproteins as TFAs from industrial sources, when consumed in equal amounts.

The WHO's 2009 [Scientific Update on trans fatty acids](#) suggests that the intake of ruminant TFAs is low enough in most populations not to constitute a significant risk factor. Because ruminant fat contains low levels of TFA (dairy and beef fat [usually contain](#) around 3 to 6% TFA, while levels in lamb and mutton can be somewhat higher), the potential amount of TFA from this source is still quite modest, even when the total ruminant fat intake is relatively high.

## Recent developments at international level

### The World Health Organization

The WHO says there is now overwhelming evidence of the adverse health effects of consuming trans fats, and recommends bringing them down to less than 1% of total daily energy intake. In its 2009 Scientific Update, it concluded that the removal of partially hydrogenated vegetable oils (the main source of trans fats in processed foods) from the food supply would result in substantial health benefits. The WHO stated that health benefits would be greatest if these oils could be replaced with vegetable oils, but even replacement with tropical oils (such as palm, palm kernel or coconut oil) or animal fats (for instance butter or lard) would result in benefits.

The WHO Regional Office for Europe's [European Food and Nutrition Action Plan 2015–2020](#) notes that the most important factors undermining health and wellbeing in Europe are diet-related, and stresses that the development of policies for eliminating trans fats from the European food supply is a priority. Accordingly, the Action Plan mandates the WHO to work with countries on achieving this task. The Regional Office says that [removing trans fats from the food supply](#) would be one of the best ways to reduce the risk of cardiovascular diseases and some cancers, and to improve diet.

In September 2015, the above-mentioned Regional Office published a [policy brief on eliminating trans fats in Europe](#), related to the Action Plan. It assesses the efficiency of the different policy options available for eliminating TFAs (legal limits on trans-fat content, voluntary reductions by the food industry and mandatory labelling). Furthermore, it notes that despite a decline in the average TFA intake in many European countries, it is estimated that millions of Europeans still consume trans fats at levels that significantly increase their risk of coronary heart disease. The policy brief concludes that the most effective measure in targeting all products containing trans fats and all socio-economic groups, would be to establish a legal limit for the content of trans fats in all foods.

### TFA regulation in the United States

Nutritional labelling of TFAs has been mandatory in the USA since 2006. As a result, the food industry started massively reducing TFA content in their products, with many big food companies like McDonalds, KFC, Starbucks and Burger King moving away from using trans fats.

The city of New York has been restricting industrially produced TFAs in restaurants since 2007, as has the state of California (since 2011). On 17 June 2015, the US Food and Drug Administration (FDA) published a [decision](#) determining that partially hydrogenated oils, the primary dietary source of industrial trans fats in processed foods, were no longer 'generally recognized as safe' for use in human food. Drawing on evidence showing qualified experts were no longer unanimous that PHOs are safe, the decision set a deadline – 18 June 2018 – by which food manufacturers need to have removed PHOs from their products.

After losing their 'generally recognized as safe' (GRAS) status, partially hydrogenated oils will qualify as food additives, subject to FDA approval. Food companies can still seek approval of exemptions for specific uses, such as the sprinkles on cupcakes and cookies.

#### **Possible substitutes to industrial TFAs**

Considering the feasibility of removing partially hydrogenated vegetable oils from the global food supply chain, the WHO noted in its 2009 Scientific Update that there is an insufficient supply of replacement fats and oils to meet demand if this is to be done in a short period of time. The WHO further said that there is a clear need to alert oil seed producers and farmers that there will likely be a need for an increased supply of replacement oils, which represents an opportunity to expand or develop new oil seed varieties. The WHO also pointed out that it is important to consider environmental sustainability in choosing appropriate replacement fats and oils.

[Possible replacements for TFAs](#) include oils produced by modified hydrogenation (altering the technique to produce oils containing less trans fats), modified oils (selective breeding or genetic engineering to create, for instance, soybean, sunflower or cotton seeds low in unsaturated fat), butter and animal fat, natural saturated oils such as palm and coconut oil, natural unsaturated vegetable oils (olive, canola, corn or soy oil) and non-fatty texture-building substances (such as plant fibre or whole oats). Saturated fatty acids, particularly palm oil, are often used in reformulating bakery foods, while unsaturated fats are normally used for replacing trans fats in reformulating fried foods.

The alternatives used in reformulating depend on the food group and production process, but [mainly include](#) non-hydrogenated vegetable fats and oils (palm, palm kernel, coconut, rape or sunflower oil). Plant breeding methods have been used to create high-oleic seed oils that are better suited for use in frying oils. Fully hydrogenated oils are also used in combination with tropical (palm and coconut) oils, especially in margarines.

### **State of play in the European Union**

#### **Current EU legislation concerning trans fatty acids**

Currently, there is no EU legislation regulating the content of trans fats in food products. There are no specific labelling requirements either. [Regulation \(EC\) No 1169/2011](#) on the provision of food information to consumers (the 'FIC Regulation'), requires food producers to list all of the ingredients contained in a product on its label or package (naming the vegetable oil used, for instance sunflower oil), but does not require them to specify the type of fats. From the list of ingredients, consumers can see whether the product contains partially hydrogenated oils. If it does, industrial trans fats could be present, but their exact proportion will not be shown.

The FIC Regulation introduces a list of mandatory nutrient information that must feature on a product's label, as well as a list of nutrients that may be listed voluntarily; TFAs are not mentioned in either list. As a consequence, legally it is not possible to indicate TFA content in the EU.

Thanks to voluntary reformulation of products by the food industry, the level of TFAs has decreased significantly over the past ten years in many EU Member States. However, foods high in trans fats can still be imported without restrictions. The maximum TFA content is currently only regulated for a specific category of foods: infant formulae and follow-on formulae.<sup>1</sup>

**EFSA**

The European Food Safety Authority (EFSA) has issued two opinions on TFAs. The first, [published in 2004](#), recognised a clear link between increased dietary intake of TFAs and elevated levels of 'bad' LDL cholesterol in blood. The 2004 opinion found no consistent scientific evidence of a relationship with blood pressure, cancer or diabetes. It noted that the TFA content of bakery products, breakfast cereals, chips, soup powders, sweets and snack products may vary considerably (from below 1% up to 30% of total fatty acids) depending on the type of fat used. Mean daily intakes of TFA in the EU ranged from 1.2 to 6.7 grams per day (from 1.2 to 6.7 g/d for men, and 1.7 to 4.1 g/d among women), corresponding to 0.5-2.1% of total daily energy intake.

EFSA's [2009 opinion](#) gave a dietary recommendation stating that TFA intake should be 'as low as possible', without compromising a nutritionally adequate diet, as fats and oils are also important sources of essential fatty acids and other nutrients. EFSA also noted that intakes of TFA had decreased considerably over recent years, mainly due to reformulation of food products to reduce their TFA content.<sup>2</sup>

**European countries**

Voluntary measures to reduce TFA content are in place in Belgium, Germany, the Netherlands, Poland, the United Kingdom and Greece. National dietary recommendations have been issued in Bulgaria, Malta, Slovakia, the UK and Finland.

Denmark was the first EU Member State to limit the content of trans fats in oils and fats intended for human consumption. According to a law adopted in 2003,<sup>3</sup> the content of trans fats may not exceed 2 grams per 100 grams of oil or fat.<sup>4</sup>

A recent [study](#) confirmed that Danish cardiovascular mortality has decreased faster than it would have done hypothetically, following the trend in other OECD countries, without the ban. [Before the ban](#), approximately 26% of products analysed (that is, fast food products, chocolates, biscuits, chips and frying oils) contained more than 2% TFAs, with many products having high levels of up to 30-40%. In a study carried out in 2013, only 6% of products were found to be high in TFAs. The ban did not cause a significant rise in prices, nor did it affect the availability of food products.

Since 2003, Switzerland (2008), Austria (2009), Iceland (2011), Hungary (2013) and Norway (2014) have also set legislative limits on industrially produced trans fats in foodstuffs, limiting the content of trans fats to a maximum of 2 grams per 100 grams of fats. Latvia notified its national measure to the Commission in September 2015.

In Germany, the Netherlands and the UK, voluntary agreements have been made with the food industry to reduce the amount of trans fats in foods.

**European Parliament**

In April 2007, four Members of the European Parliament (MEPs) presented a [declaration](#) calling for more restrictive regulation of trans fats in the EU. In November 2008, Parliament's Policy Department A published a [study](#) examining different models of regulation in EU and non-EU countries, and recommending that a ban of industrial TFA be considered at EU level.

In recent years, MEPs have posed several questions to the Commission insisting on the introduction of legislation to regulate the presence of industrially produced TFAs in food marketed in the EU. On 14 April 2015, the MEP Heart Group – which actively promotes measures to reduce the burden of cardiovascular diseases – organised a panel discussion on this subject. The group co-chairs addressed a [letter](#) to Commission

President Jean-Claude Juncker, calling on him to bring forward a proposal to set legal limits on the use of trans fatty acids in foodstuffs in the EU.

### **Council**

In September 2015, the Council discussed the issue of trans fats in an informal meeting of health ministers in Luxembourg. According to the [discussion paper](#) submitted for the debate, at a previous informal meeting held in Riga in April 2015, a large majority of Member State delegations had expressed their support for the necessity of reducing TFAs in food products. However, different views have been voiced on how best to achieve this, with some Member States preferring independent national approaches coupled with voluntary cooperation with the food industry, while others favour binding EU legislation. Several Member States have signalled their readiness to take national measures in the absence of a decision at EU level.

### **European Commission**

When the FIC Regulation was adopted in 2011, the Commission was asked to submit by 13 December 2014 a report on the presence of trans fats in foods and in the overall diet of the EU population, accompanying it with a legislative proposal, if appropriate. On 3 December 2015, a year later than scheduled, the Commission published the said [report](#), based on [data](#) gathered and analysed by the Joint Research Centre (JRC).

The report notes that even though the majority of EU food products analysed contain less than 2 grams of trans fats per 100 grams of fat, some products, such as biscuits and popcorn, have TFA values of up to 40-50 grams per 100 grams of fats. In some eastern and south-eastern European countries, TFA levels in pre-packed bakery products have hardly fallen at all over the past ten years, suggesting that certain parts of the EU have seen little progress.

The average TFA intake has been decreasing in many European countries to below the recommended level of 1% of daily energy intake. However, some parts of the population, such as low-income citizens and those within the 18-30 age range, are at risk of excessive consumption.

The Commission report notes that the limited information on consumer understanding of TFAs suggests that the majority of Europeans do not know about TFAs and the risks they pose to health. Therefore, mandatory labelling would make little sense without appropriate consumer education programmes. Labelling would also only target pre-packed foods, not food sold loose or food consumed in restaurants.

The Commission considers that efforts to reduce TFA levels should be targeted at industrial TFAs, because the proportion of trans fatty acids in those can be modified, whereas their proportion in ruminant fats is relatively stable.

The report concludes that setting a legal limit for industrial TFA content would be the most effective measure in terms of public health, consumer protection and compatibility with the single market. The Commission will launch a public consultation and carry out an impact assessment on how to put this into practice technically, before deciding on the way to proceed.

The Commission report was presented to the Employment, Health, Social Policy and Consumer Affairs Council on 7 December 2015.



## Stakeholder views

Following the FDA's decision to ban industrial trans fats, the [European Society of Cardiology](#) (ECS) urged European policy-makers to bring forward EU-wide regulation urgently. According to the ECS, cardiovascular disease causes 47% of all deaths in Europe, accounting for over 4 million deaths each year.

The European Consumer Organisation (BEUC) has been [calling](#) for years for legislation banning industrial TFAs or setting a limit on them. BEUC [welcomed](#) the Commission's report, saying that restricting the use of trans fats is one of the easiest and fastest measures to improve consumer health.

In October 2015, a group of four big food companies (Nestlé, Kellogg's, Mars and Mondelez), together with BEUC, the Standing Committee of European Doctors (CPME), the European Heart Network (EHN) and the European Public Health Alliance (EPHA) sent an [open letter](#) to the European Commission, calling for a legislative limit of 2 grams per 100 grams of fat to be set for industrial TFAs in foods.

[FoodDrinkEurope](#), the confederation of European food and drink companies, stresses the product reformulation efforts made by the industry over the past decades. Although TFAs from partially hydrogenated vegetable oils have virtually been eliminated from many products, small and medium-sized enterprises, in particular, still face technological difficulties in achieving this aim. FoodDrinkEurope supports implementing a recommendation that the proportion of industrial TFAs in the total fat content should be a maximum of 2%. It also points out that a total ban on industrial trans fats is not feasible, since all refined vegetable oils and fats contain small unavoidable amounts of them. Therefore, trace amounts should be permitted, for instance in additives and flavourings.

[The European Margarine Association \(IMACE\)](#) stresses that most margarines and spreads today are 'already virtually free of TFAs, despite the challenge of reformulating while maintaining technical performances of the product'. If, however, legislators decide to introduce a legal limit, the current mandatory hydrogenation labelling should be deleted. According to IMACE, this labelling does not bring any added value to the consumer, as it does not provide information about the actual TFA content; in addition, it is discriminatory, as labelling does not apply to ruminant TFA.

[The European Vegetable Oil and Proteinmeal Industry Federation](#) (FEDIOL) welcomed the Commission report, recalling that it has been advocating an EU wide legal limit of 2% of TFAs on fat basis in product sold to the final consumers. In FEDIOL's view this would address the health concerns and ensure a level playing field across Europe.

### Other EU actions and outlook

The [EU Platform for Diet, Physical Activity and Health](#) discussed the trans fats issue in its meeting in September 2015, and members of the Platform have made commitments to reformulate their products to reduce trans fat content. The [High-Level Group on Nutrition and Physical Activity](#) published in 2015 an [overview of EU Member States' national initiatives](#), indicating that in 22 Member States trans fats are among the priorities with respect to reformulation or nutrient policy.

The overview will be used by the current Netherlands Presidency to inform their actions, as product reformulation is one of their priorities in the food-related area. The Netherlands hosted a [conference](#) on improving product composition on 22-23 February 2016 in Amsterdam.

At the Health Council meeting on 17 June in Luxembourg, the Presidency is planning to submit draft Council conclusions on food products improvement.

## Main references

[Eliminating \*trans\* fats in Europe – A policy brief](#), World Health Organization Regional Office for Europe, 2015.

[Proceedings of the Workshop on Trans Fats](#), European Parliament, DG IPOL, 2014.

[Report from the Commission to the European Parliament and the Council regarding \*trans\* fats in foods and in the overall diet of the Union population](#), European Commission, 2015.

## Endnotes

<sup>1</sup> [Commission Directive 2006/141/EC](#) on infant formulae and follow-on formulae and amending Directive 1999/21/EC.

<sup>2</sup> The average intake of TFA in the United Kingdom had halved to less than 1% of total energy intake; in France intakes had reduced by 40% to 1% of total energy intake (with 0.6% ruminant TFA and 0.4% TFA from non-ruminant sources), and in Denmark, Finland, Norway and Sweden average intakes had fallen to around 0.5 to 0.6% of total energy intake.

<sup>3</sup> Executive Order No 160 of 11 March 2003 on the Content of Trans Fatty Acids in Oils and Fats.

<sup>4</sup> In 2004, the European Commission [requested](#) that Denmark suspend its regulation, arguing that the restrictions can have adverse effects on trade within the EU. The case was dropped in 2007, when the Commission accepted the Danish argument that the measure was justified in the interest of public health.

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