

## ACRYLAMIDE FACT SHEET

### What is acrylamide?

Acrylamide is a chemical that naturally forms in starchy food products during every-day high-temperature cooking (at above 120°C and low-moisture), due to a reaction between sugars and amino acids naturally present in many foods. This is known as the Maillard Reaction that also 'browns' food and affects its taste.

It is important to understand that **acrylamide is not added to food**. It naturally forms in a wide range of products, such as bread, biscuits, potato crisps, French fries and coffee, whether they are cooked at home, in restaurants or commercially. Even though scientists only discovered it in food in 2002, it has actually been present in the human diet for as long as people have been baking, grilling, roasting, toasting or frying foods. The amount of acrylamide in food depends on a wide range of factors, including crop variability, recipe design and process control.

### What are the risks for consumers?

While acrylamide has been found to cause cancer in animals in laboratory tests, evidence on the effect of dietary exposure to acrylamide on **human health remains inconclusive**. In 2015, the European Food Safety Authority (EFSA) reconfirmed previous evaluations that based on animal studies acrylamide potentially increases the risk of developing cancer for consumers in all age groups.<sup>1</sup>

### How is acrylamide currently legally managed?

In addition to general legislation applicable to all foods, Commission Recommendation 2010/307/EU<sup>2</sup> recommends that Member States should monitor acrylamide levels in certain specified foodstuffs and report the data annually to EFSA. Based on the results of the monitoring in the Member States from 2007–2011, the Commission set '*indicative values*' for acrylamide in various foodstuffs, which were then updated in Commission Recommendation 2013/647/EU<sup>3</sup>.

The '*indicative values*' are **not safety thresholds** but are intended to indicate the need for an investigation. The recommendation states that investigations should verify whether the food business operator has identified the relevant processing steps which may lead to acrylamide formation and whether appropriate mitigation measures have been taken.

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<sup>1</sup> EFSA Journal 2015;13(6): 4104

[EFSA scientific opinion on acrylamide in food](#)

<sup>2</sup> [Commission Recommendation 2010/307/EU](#)

<sup>3</sup> [Commission Recommendation No 2013/647/EU](#)

## What have food business operators done?

Since acrylamide was first identified in food in 2002, the food industry has worked closely with scientists and regulators to mitigate acrylamide formation. EFSA acknowledged that **FoodDrinkEurope's 'acrylamide toolbox'<sup>4</sup> is an important initiative to reduce acrylamide across food categories**. The toolbox provides information on tools to try to reduce the formation of acrylamide in foods. The toolbox was first published in 2005 and updated in 2013; it has been developed in close cooperation with the European Commission and national authorities. Uniquely it has been a collaborative effort across the food industry and contains ideas that are still at research or development stage as well as tools that have been shown to work in the commercial environment.

## What has been the result?

Many food business operators have found the toolbox approach to be very useful. Where they have applied tools, they have **seen reductions in acrylamide levels in their products**. These food business operators have embedded the tools as part of their food safety management systems.

For example, as referenced by EFSA, a dataset of over 40,000 samples of potato crisps from 20 European countries for the years 2002 to 2011 show that mean levels of acrylamide fell by 53%. In the same timeframe, the proportion of samples exceeding the indicative values for acrylamide fell from 23.8% to 3.2%.

## Is the toolbox being used by all food business operators?

It is known that tools included in the toolbox are already being used by the industry to a significant extent. As examples, in the biscuit industry, the application of asparaginase is seen as a key mitigation measure for the sector as it has been shown to be effective in many application opportunities to reduce acrylamide levels in biscuit products. Similarly, the French fries manufacturers voluntarily lowered cooking temperatures on all product packaging as of 2004 recommending frying at max. 175°C and typically 200-220°C for oven-cooked products, so that products are cooked to a light golden colour, limiting the potential formation of acrylamide. For the manufacturing of breakfast cereals, a key mitigation measure taken is to ensure an effective combination of temperature and/or heating times. Great care is taken not to over-bake or over-toast the product to minimize acrylamide formation whilst still baking to a food safe level.

However, data which indicates the take-up and effectiveness of these tools across the wider food industry (and in particular among small businesses) is not readily available. On the basis of the toolbox, sectors developed Codes of Practice for their products. **The purpose of the Codes of Practice is to require all food business operators to take action to mitigate acrylamide**. The Codes of Practice are intended to be an extension of the toolbox approach, and it is for this reason that the food industry supports making it mandatory for all relevant businesses.

The mandatory application and enforcement of the Codes of Practice will lead to a reduction in acrylamide levels and consumer exposure. It will also broaden understanding

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<sup>4</sup> [FoodDrinkEurope acrylamide toolbox](#)

of the issue and promote innovation of potential tools for mitigation across the food industry.

## What's in the pipeline?

The European Commission intends to publish a draft Regulation to reduce the presence of acrylamide in food and beverage products before the end of 2016. The main elements of the proposal are expected to be:

- to make it mandatory for food business operators to reduce acrylamide to As Low As is Reasonably Achievable (ALARA) by applying Codes of Practice developed by EU food industry associations and vetted by the Commission and national authorities;
- to establish the indicative values as benchmarks for food business operators and authorities to verify if mitigation measures are effective, and to review and reduce these indicative values immediately and periodically thereafter.

The Regulation will be a subsidiary measure under Regulation (EC) No 853/2004 on the hygiene of foodstuffs. It will be adopted via the regulatory procedure with scrutiny, which gives the Parliament and Council three months to scrutinise the draft measure.

## Will it be enforceable?

Thanks to the Official Controls legislation, compliance will now be strictly assessed as part of official controls. **Non-compliance will generate penalties like other breaches of food legislation.** Authorities will be able to ask food manufacturers for records of acrylamide mitigation activities to verify compliance. Penalties for any infringement will be handled on the basis of national legislation.

## Would legal limits be better from a public health perspective?

No, because the public health objective is to reduce consumer exposure as much as possible and to ensure that efforts are made along the whole food chain. **Requiring food business operators to target the lowest achievable levels will do more to reduce exposure** than simply requiring them to be below maximum values for the following reasons:

- Maximum values are static: they require compliance and do not encourage continuous improvement or levels that are ALARA
- While production process controls can help to reduce acrylamide levels, they cannot guarantee consistent outcomes: “outliers” will sometimes occur. Systematic pre-testing to ensure that, e.g. every portion of French fries in Europe is below set maximum levels, would be impossible.
- Legal limits would be difficult to enforce beyond manufactured food products. However, acrylamide formation also occurs during food preparation in restaurants and catering industries (dominated by SMEs) and in the home.

- Maximum levels would be a considerable burden on small and medium-sized enterprises; the testing required would have substantial financial and logistical impact.

In contrast, embedding the ALARA principle in legislation together with benchmarks (indicative values) will encourage continuous improvement and will be workable for the whole food chain.

Therefore, a regulation that includes indicative values and makes it mandatory for companies to reduce acrylamide to as low as is reasonably achievable is the most effective way to continue to reduce consumer exposure.