

## Acrylamide

Acrylamide is a chemical substance formed when starchy foods, such as potatoes and bread, are cooked at high temperatures (above 120°C). It can be formed when foods are:

- Baked
- fried
- grilled
- toasted
- roasted

Acrylamide is not deliberately added to foods – it is a natural by-product of the cooking process and has always been present in our food.

It is found in wide range of foods including:

- roasted potatoes and root vegetables
- chips
- crisps
- toast
- cakes
- biscuits
- cereals
- coffee

### **Potential health effects of acrylamide**

Laboratory tests show that acrylamide in the diet causes cancer in animals. Scientists agree that acrylamide in food has the potential to cause cancer in humans as well. We recommend that the amount of acrylamide we all consume is reduced, as a precaution.

### **What the food industry is doing to reduce acrylamide**

The food industry has undertaken a lot of work to identify and implement measures to reduce acrylamide levels in food. This includes developing guidance on ways to limit acrylamide formation in a variety of foods and processes. New legislation will require food business operators to put in place simple, practical steps to manage acrylamide within their food safety management systems.



## Acrylamide legislation

Information on the measures concerning acrylamide levels in food, guidance for food business operators and benchmark levels for monitoring acrylamide levels in different food categories.

All food businesses operators (FBOs) are required to put in place simple practical steps to manage acrylamide within their food safety management systems. This ensures that acrylamide levels are as low as reasonably achievable in their food.

Regulation 2017/2158 establishes best practice, mitigation measures and benchmark levels for the reduction of the presence of acrylamide in food.

Businesses are expected to do the following:

- be aware of acrylamide as a food safety hazard and have a general understanding of how acrylamide is formed in the food they produce;
- take the necessary steps to mitigate acrylamide formation in the food they produce - adopting the relevant measures as part of their food safety management procedures
- undertake representative sampling and analysis where appropriate, to monitor the levels of acrylamide in their products as part of their assessment of the mitigation measures
- keep appropriate records of the mitigation measures undertaken, together with sampling plans and results of any testing
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The measures are proportionate to the nature and size of the business, to ensure that small and micro-businesses are not burdened. The legislation applies to all FBOs that produce or place on the market the foods listed below:

- french fries, other cut (deep fried) products and sliced potato crisps from fresh potatoes
- potato crisps, snacks, crackers and other potato products from potato dough
- bread
- breakfast cereals (excluding porridge)
- fine bakery wares: cookies, biscuits, rusks, cereal bars, scones, cornets, wafers, crumpets and gingerbread, as well as crackers, crisp breads and bread substitutes



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- coffee: (i) roast coffee; (ii) instant (soluble) coffee
- coffee substitutes
- baby food and processed cereal-based food intended for infants and young children

Different requirements apply to local and independent FBOs selling food directly to the consumer or directly into local retail. For example, independent cafes, fish and chip shops and restaurants.

For larger centrally controlled and supplied chains with standardised menus and operating procedures the legislation reflects that the controls of acrylamide can be managed from the centre. This would apply to for example, large restaurants, hotels and café chains.

## **How to reduce acrylamide at home**

To reduce your consumption of acrylamide when preparing food at home, we advise you should:

- aim for a golden yellow colour or lighter when frying, baking, toasting or roasting starchy foods
- follow the cooking instructions on the pack when cooking packaged foods like chips and roast potatoes
- eat a healthy, balanced diet and get your 5 A Day to help reduce your risk of cancer

You also need to make sure that you don't store raw potatoes in the fridge if you intend to cook them at high temperatures, such as by roasting or frying. This is because keeping raw potatoes in the fridge can lead to the formation of more free sugars in the potatoes. This process is sometimes called 'cold sweetening'.

Cold sweetening can increase overall acrylamide levels, especially if the potatoes are then fried, roasted or baked. Raw potatoes should be stored in a dark, cool place at temperatures above 6°C.

## **FSA Explains**

Acrylamide is formed during high temperature cooking, when water, sugar and amino acids combine to create a food's characteristic flavour, texture, colour and smell. This process is called the Maillard reaction. Long cooking times and higher temperatures form more acrylamide than short cooking times and lower temperatures.



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Organisations including the World Health Organisation, the European Food Safety Authority (EFSA) and UK scientific advisory committees have assessed the risks posed by acrylamide.

In 2015, the EFSA published its risk assessment of acrylamide in food. The assessment confirms that acrylamide levels found in food have the potential to increase the risk of cancer for people of all ages. However, it's not possible to estimate how much the risk is increased. Acrylamide in your diet could contribute to your lifetime risk of developing cancer.

As it's not possible to establish a safe level of exposure for acrylamide to quantify the risk, the EFSA used a 'margin of exposure' approach. The margin of exposure (MOE) approach provides an indication of the level of health concern posed by a substance's presence in food.

EFSA's Scientific Committee states that, for substances that are genotoxic and carcinogenic, a MOE of 10,000 or higher is of low concern for public health. The MOE identified in our total diet study on acrylamide have indicated a concern for public health. These range between 300 for an average adult consumer and 120 for toddlers.

## FSA work on acrylamide

To understand more about acrylamide and how to reduce the risk it presents we are:

- supporting food manufacturers' initiatives to reduce acrylamide in foods
- conducting and publishing annual monitoring data for acrylamide in a range of foods
- working with industry to help manufacturers comply with the new legislation
- advising people what they can do to reduce acrylamide in food they cook at home

## **Further info...**

<https://www.food.gov.uk/safety-hygiene/acrylamide>

<https://www.nhs.uk/live-well/eat-well/how-to-prepare-and-cook-food-safely/>

