

Acrylamide – the risk?

Amanda Woodvine updates a food scare that first surfaced four years ago

It causes cancer in animals, was discovered in food by chance in 2002 and sent shock waves through the scientific world – not least because of the wide range of products that contain large amounts of it. Acrylamide is in starchy foods cooked at high temperatures, including crisps, cereals, chips, bread and crispbreads.

Four years down the line, the panic seems to have disappeared but has the problem?

Acrylamide is an industrial chemical with a variety of uses – so many that between 80,000 and 100,000 tonnes of it are made in the EU each year. Cigarette smoking is another source.

The presence of acrylamide in cooked foods was stumbled upon by a team of Swedish scientists in April 2002 – particularly crisps and biscuits where it was present at higher levels the World Health Organisation (WHO) recommends for drinking water (1).

Several countries have now confirmed the Swedish findings, reporting similarly high levels of acrylamide in their crisps, cereals and chips. Studies with potatoes found no measurable levels, whether raw or boiled. When fried, however, there were significant levels and overcooking fried potatoes seemed to increase the levels even further (6).

Acrylamide in food isn't due to contamination but is a natural by-product that forms when certain foods are fried, baked, roasted, toasted or even microwaved at high temperatures (14). The highest levels found so far have been in starchy foods such as potato and cereal products. It seems there is no escape by switching to organic products as it is the cooking itself which is responsible.

When foods are cooked, a reaction takes place which gives them their distinctive colour and flavour (the Maillard reaction). It's what makes baked bread taste better than raw dough and fried potatoes very different to boiled. The key ingredients in this process are 'free amino acids', especially one called asparagine.

Experiments by food chemist Don Mottram, of Reading University, and Richard Stadler, of the Nestle Research Centre in Switzerland (2, 3), have shown that heating asparagine with sugar at 185°C turns much of it into acrylamide.

Acrylamide forms at temperatures between 120 and 140°C so exposing food to higher temperatures, such as in crisp making,

produces more of the stuff. So too does cooking for longer. Fast-food French fries are particularly high in it – one large serving giving more than 300 times the amount allowed in a glass of drinking water (8). And the browner the colour of food, the more acrylamide it is likely to contain. Dark brown crisps contain particularly high levels and are best discarded (11).



Even toasting raises acrylamide levels in bread significantly – particularly the crust – while crumpets and naan bread are far less sensitive.

The big question is – is it doing us any harm? The International Agency for Research on Cancer (IARC) reckons acrylamide is 'probably carcinogenic to humans' – but based on animal studies (14). Few studies have been done on humans but workers exposed to acrylamide through the air and skin contact didn't show increased rates of cancer death – although the studies are seen as inadequate.

The US Food and Drug Administration remains uncertain, saying that some risk should be assumed.

The WHO and the UK's Food Standards Agency maintain there's no need to change our diets or alter the way we cook food but everyone should eat a healthy, balanced diet including plenty of fruit and vegetables.

There is one obvious piece of advice – when cooking, don't frazzle it!

