

Frequently Asked Questions about glycidamide in food

BfR FAQs 17 March 2009

In the summer of 2008 research scientists at the Technical University of Munich besides acrylamide detected glycidamide in potato crisps. Glycidamide is a metabolite of acrylamide. In its risk assessment of acrylamide BfR already took the toxic properties into account. Nevertheless, questions are repeatedly directed at BfR about the harmfulness of glycidamide. Here are the answers to the frequently asked questions.

What is glycidamide?

In the food context glycidamide is known above all as a metabolite of acrylamide. After the consumption of acrylamide-containing foods, the body converts this substance into glycidamide. Acrylamide, in turn, may be formed during the heating above all of carbohydrate-rich foods, mainly potatoes and cereals to high temperatures. We have put together further information on acrylamide in the document "Frequently Asked Questions about Acrylamide".

More recent research findings have shown that glycidamide can also be directly formed in food. It is formed during the heating of food to high temperatures, too, from the reaction between acrylamide and the hydroperoxides in unsaturated fatty acids. The levels of glycidamide detected up to now in food are relatively low. They account for roughly 1% of the glycidamide formed in the body during the metabolism of acrylamide.

In the summer of 2008 the Technical University of Munich published its research findings on glycidamide. What did they encompass?

The scientists had examined crisps and chips and identified glycidamide levels of between 0.3 and 1.5 microgram per kilogram. Whereas it has been possible for some time now to reliably detect acrylamide in processed foods, up to now it had been very difficult to determine glycidamide.

Is glycidamide harmful?

The substance acrylamide from which glycidamide is formed is deemed to be mutagenic and carcinogenic. It can be assumed that the effects of acrylamide are mainly caused by its metabolite glycidamide. As glycidamide is mainly formed during the metabolism of acrylamide in the body, BfR already took into account the toxic properties of glycidamide in its health assessment of acrylamide.

The levels of glycidamide detected so far in food are very low. They account for roughly 1% of the acrylamide formed in the body during metabolism. According to the current level of scientific knowledge, these levels do not constitute any additional health risk to the risk which is already associated with the consumption of acrylamide-containing foods. At the present time it is unclear whether glycidamide is stable for long enough in food for it to be absorbed after consumption by the organism.

Is there a limit value for glycidamide in food?

Like its parent substance acrylamide, glycidamide is mutagenic and is probably carcinogenic in animal experiments. For substances that are both mutagenic and carcinogenic, no limit value can be established up to which intake could be deemed to be safe. Substances of this

kind in food should be reduced as far as possible. For acrylamide the Federal Office of Consumer Protection and Food Safety (BVL) has, therefore, promoted a minimisation concept since 2002. In the final instance, the minimisation of acrylamide also means the minimisation of glycidamide that is formed from acrylamide.

What can consumers do to avoid glycidamide?

Like acrylamide glycidamide belongs to the group of heat-related contaminant. These are undesirable substances that are formed during the preparation of food at high temperatures. Glycidamide and acrylamide are formed during the heating of carbohydrate-rich foods like for instance potatoes and cereals. The formation of both contaminants in food should be avoided as far as possible. The "call for minimisation" is directed both at the manufacturers of carbohydrate-rich foods and consumers who prepare for instance potatoes or cereals at home.

For roasting, baking and frying the general rule still applies "golden instead of charred": far lower amounts of acrylamide are formed at temperatures below 180 °C than at higher temperatures.

The aid Informationsdienst (information service) has compiled further tips on how to avoid acrylamide on its website www.was-wir-essen.de (in German).

Should consumers use saturated rather than unsaturated fatty acids when preparing foods in order to avoid the formation of glycidamide?

Analyses of glycidamide in food have shown that the frying of chips in sunflower oil, that contains many unsaturated fatty acids leads to the formation of more glycidamide than frying in coconut oil that mainly contains saturated fatty acids. This raises the question whether it makes sense for consumers to use oils and fats with many saturated fatty acids for roasting, baking or frying so as to avoid very low levels of glycidamide.

It should, however, be borne in mind that the excessive consumption of saturated fatty acids has a detrimental effect on the cardiovascular system. Hence, BfR is of the opinion that there are no health advantages for consumers when they use more saturated fatty acids for the preparation of food to avoid relatively low levels of glycidamide.

Further information on fats and oils can be found on the website of aid Informationsdienst www.was-wir-essen.de (in German).