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Acrylamide in Food

Acrylamide is an undesired byproduct that can be formed in food due to certain thermal production processes. It is an example of what is called a process contaminant.[1]

Acrylamide contamination is caused by the Maillard reaction. This is a non-enzymatic browning reaction that is triggered by heat. By heating a foodstuff (> 120 °C), regardless of whether it is baked, deep-fried, or pan-fried, certain amino acids (e.g. asparagine) and reducing sugars (e.g. glucose or fructose) are transformed into new compounds. The compounds resulting from the browning reaction are enormously important for the sensory perception (smell, taste) of the food product, which is why this is indispensible in the production process. However, in food products that have a high amount of amino acids and reducing sugars, this can also result in an elevated level of acrylamide formation. In animal testing, it has been demonstrated that acrylamide intake increases the risk of cancer. Infants are especially susceptible to this elevated risk.[1]

In order to protect the consumer from the dangerous effects of acrylamide, on November 20th, 2017, the European Commission passed the Regulation (EU) 2017/2158, which defines mitigation measures for food producers and lays down lower benchmark levels that went into effect on April 11th, 2018.

The mitigation measures aim to differentiate between various food groups and the way they are processed, in order to keep the acrylamide content as low as possible. For example, when selecting raw materials, producers should favor those that are known to result in a lower acrylamide concentration after processing. The processing temperature (e.g. for baking, frying, or roasting) should not exceed 175 °C. The time that the foodstuff is exposed to higher temperatures should be reduced and/or the same result of processing should be achieved with lower temperatures by using different frying oils and fats.[2]

Furthermore, regular monitoring by means of sampling and analysis as well as official inspections by the authorities of the EU Member States are also planned.

Benchmark Levels for Acrylamide for Various Food Groups According to (EU) 2017/2158:[2]

Food	Benchmark Level [µg/kg]
• French fries (ready-to-eat)	500
• Potato chips/crisps/dough/crackers and other potato based products	750
• Soft bread	
a) Wheat based bread	50
b) Soft bread not based on wheat	100
• Breakfast cereals (excluding porridge)	
a) bran products and whole grain cereals, puffed grain	300
b) wheat and rye based products	300
c) corn/maize, oat, spelt, barley and rice based products	150
• Biscuits/cookies and wafers	350
• Crackers with the exception of potato based crackers	400
• Crispbread	350
• Ginger bread	800
• Products similar to the other products in this category	300
• Roast coffee	400
• Instant (soluble) coffee	850
• Coffee Substitutes	
a) coffee substitutes exclusively from cereals	500
b) coffee substitutes exclusively from chicory	4000
• Cereal based foods for infants and young children (excluding cookies/biscuits and rusks)	40
• Biscuits/cookies and rusks for infants and young children	150

The GBA Group can test for acrylamide in your products and provide you with comprehensive consulting on this topic. We will continue to update you on the latest developments.

LITERATURE

[1] Bundesamt für Verbraucherschutz und Lebensmittelsicherheit. Was ist Acrylamid? https://www.bvl.bund.de/DE/01_Lebensmittel/02_UnerwuenschteStoffeOrganismen/04_Acrylamid/lm_acrylamid_node.html, accessed on 04 January 2018

[2] Official Journal of the European Union. (21.11.2017). Commission Regulation (EU) 2017/2158 Brussels.

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