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## **Polyamide oligomers: plastic components from kitchenware**

BfR Opinion No. 014/2018 of 30 May 2018



Kitchenware made of polyamide (PA) is widely used during baking, frying and cooking. But certain components of this type of plastic can migrate from the ware into food and therefore pose potential health problems. This is the finding of an assessment conducted by the German Federal Institute for Risk Assessment (BfR).

The BfR assessed the health risks of ring-shaped oligomers migrating from polyamide of types PA6 and PA66 into food. PA oligomers are compounds made of a small number of molecules such as caprolactam (PA 6) or adipic acid/hexamethylenediamine (PA 66). These types of oligomers occur non-intentionally during hardening (polymerisation) of the plastic. Due to their low molecular size, they can diffuse through the plastic and migrate into foodstuff.

Given the lack of experimental toxicological data on PA oligomers, the scientists at the BfR employed the TTC concept. TTC stands for “threshold of toxicological concern”. This method divides substances for which no toxicological information is available into (Cramer) classes based on their chemical structure. Each class is assigned a maximum daily intake below which it is unlikely that the corresponding substances pose a health risk. This is achieved by utilizing comprehensive data on chemical compounds for which there is already sufficient information regarding their health risks.

The PA oligomers are not suspected of being carcinogenic. According to the TTC concept, therefore, a daily intake of up to 90 micrograms (0.09 milligrams) of the individual ring-shaped PA oligomers (based on a person weighing 60 kilograms) is unlikely to pose a health risk. However, studies conducted by the food monitoring authorities and the BfR show that it ring-shaped PA oligomers are likely to migrate at higher levels from kitchenware into food.

The BfR concludes that a final risk assessment is not possible until sufficient information becomes available from toxicological studies. The BfR therefore recommends that the producers collect toxicological data in line with the stipulations of the European Food Safety Authority (EFSA) and provide these to the BfR.

		BfR Risk Profile: Polyamide oligomers from kitchenware (Opinion No. 014/2018 )			
<b>A</b> Affected group	General population 				
<b>B</b> Probability of health impairment due to regular oligomer intake from kitchenware	Practically impossible	Improbable	Possible	Probable	Certain
<b>C</b> Severity of health impairment due to regular intake	No impairment	Slight impairment conceivable	Moderate impairment		Serious impairment
<b>D</b> Validity of available data	High: the most important data is available and there are no contradictions		Moderate: some important data is missing or contradictory	Low: much important data is missing or contradictory	
<b>E</b> Controllability by the consumer [1]	Control not necessary	Controllable through precautionary measures	Controllable through avoidance	Not controllable	

Text fields with dark blue background highlighting characterise the properties of the risk assessed in this Opinion (for more details, please see the text of BfR Opinion No. 014/2018 of 30 May 2018).

**Explanations**

The Risk Profile is designed to visualise the risk described in the BfR Opinion. It is not designed to permit risk comparisons. The Risk Profile should only be read together with the Opinion.

### More information on oligomers on the BfR website

<https://www.bfr.bund.de/cm/349/levels-of-styrene-oligomers-measured-in-food-simulants-show-that-health-risks-are-unlikely.pdf>



BfR “Opinions app”

The full version of this BfR opinion is available in German on:

<https://www.bfr.bund.de/cm/343/polyamid-oligomere-kunststoffbestandteile-aus-kuechenutensilien.pdf>

### About the BfR

The German Federal Institute for Risk Assessment (BfR) is a scientifically independent institution within the portfolio of the Federal Ministry of Food and Agriculture (BMEL) in Germany. It advises the Federal Government and Federal Laender on questions of food, chemical and product safety. The BfR conducts its own research on topics that are closely linked to its assessment tasks.

*This text version is a translation of the original German text which is the only legally binding version.*