

Pyrrrolizidine alkaloids: Levels in foods should continue to be kept as low as possible

BfR Opinion No 030/2016 of 28 September 2016

The Federal Institute for Risk Assessment (BfR) has been involved for several years with the problem of food contamination through 1,2 unsaturated pyrrolizidine alkaloids (PAs). PAs are secondary ingredients formed by plants to ward off predators. They are undesired in foods because of their toxic effect in the liver and their mutagenic and carcinogenic effects in animal experiments. This **overall assessment** takes into account data on the toxicology of PAs, consumption data on the various foods and the latest data on the levels found in milk, eggs, meat, fruit tea, honey, herbal tea, black tea and green tea, as well as spices, flours and dietary supplements as relevant food groups.

Contaminated herbal teas, including rooibos, as well as black tea, green tea and honey are the main sources through which consumers can ingest PAs. The PAs contained in foods can constitute a potential health hazard for children and adults if ingested over longer periods (chronic), but there is no acute health risk here.

Feeding studies show that PAs from animal feed only transfer to milk and eggs to a small extent, while they were not detected at all in meat. Consequently, the contribution of these foods to the total PA intake is negligible. Fruit tea is hardly contaminated with plants containing PAs either and therefore has no appreciable influence on total intake.

Certain plant-based dietary supplements constitute another potential source of intake of PAs. Adults can ingest larger quantities of PAs through products of this kind. In the view of the BfR, the quantities ingested via dietary supplements along with products with high PA levels can clearly exceed the average quantity of PAs ingested via food. Short-term and in particular long-term intake of products of this kind can therefore pose a health risk.

Some spices, herbs and flours are contaminated with PAs, thus constituting a further potentially relevant source of intake. There is insufficient data, however, to assess these products individually. Lettuce mixtures and leaf vegetables can also be contaminated with plant components containing PAs.

The BfR recommends measures with which the PA contamination of foods can be reduced. These include the continuation of efforts to further reduce PA levels in foods through improved cultivation, harvesting and cleaning methods. This applies mainly to herbal teas, black tea and green tea, as well as certain dietary supplements. Consumers' total PA intake should be as low as possible in order to protect high consumers of foods with potentially higher PA levels and in particular children from an increased health risk. Lettuce mixtures and leaf vegetables should be examined continuously using suitable methods by food companies and traders, as well as food monitoring authorities. The BfR website contains some frequently asked questions on PAs in food.

		BfR Risk Profile: PA intake from honey, tea (except fruit tea), dietary supplements (DS) (Opinion No. 030/2016)				
A	Affected	General public [1] 				
B	Likelihood of a health impairment through the long-term consumption of honey, tea (except fruit tea) and DS with high PA levels	Practically excluded	Unlikely	Possible	Probable	Certain
C	Severity of the health impairment through the long-term consumption of honey, tea (except fruit tea) and DS with high PA levels	The severity of the impairment can vary [2]				
D	Validity of the available data	High: The most important data are on hand and free of contradiction	Medium: Some important data are missing or contradictory	Low: Numerous important data are missing or contradictory		
E	Controllability by the consumer	Control not necessary	Controllable through preventive measures [3]	Controllable by refraining [3]	Not controllable	

Squares highlighted in dark blue indicate the properties of the risk assessed in this opinion (more detailed information on this can be found in the text of BfR Opinion No. 030/2016 of 28 September 2016).

Explanations

The risk profile is intended to visualise the risk outlined in the BfR opinion. It is not intended to make risk comparisons. The risk profile should only be read in the context of the opinion.

[1] Line A

The outlined risks apply in particular to high consumers.

[2] Line C

A difference should be made between acute and chronic effects. Chronic effects should always be regarded as severe (cancer, irreversible).

[3] – Line E – Controllability by the consumer

The BfR does not make any recommendations to consumers in this opinion. These are to be found in the BfR FAQ on PAs in foods. The BfR recommends risk management measures to minimise risks. In the view of the BfR, the PA levels in the relevant food groups should be kept as low as possible.

About the BfR

The 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.