

DOI 10.17590/20180503-095617-0

Table potatoes should contain low levels of glycoalkaloids (solanine)

BfR Opinion No 010/2018 of 23 April 2018

Potatoes belong to the nightshade family of plants. In addition to many nutritionally valuable ingredients, potatoes can also contain glycoalkaloids which are typical for this plant family. The most common glycoalkaloids that occur in potatoes are α -solanine and α -chaconine. These secondary ingredients serve as a defence mechanism against pests and germs. The consumption of green, sprouting or damaged potatoes can lead to poisoning through glycoalkaloids. Cases of minor poisoning cause symptoms such as nausea, stomach-ache, vomiting and diarrhoea, sometimes accompanied by fever. In severe cases, impairment of consciousness and very rarely complete loss of consciousness can occur, along with disturbances in brain function, breathing and in the cardiovascular system. There are also reports of isolated instances of deadly poisoning. Only a few cases of poisoning have been reported and documented in the last 100 years. Due to the non-specific symptoms, the actual number could be considerably higher.

In November 2015, illness connected with the consumption of potato dishes was observed in a family. After eating jacket potatoes and potatoes boiled in the skin, symptoms such as vomiting and stomach-ache occurred. Investigations showed that the potatoes had a glycoalkaloid content of 236 mg (milligrams) per kg (kilogram) potatoes. Until now, potatoes with a glycoalkaloid content of up to 200 mg per kg fresh weight had generally been considered safe. The very slight difference between what had previously been recognized as a safe level of glycoalkaloids and those observed in the actual case of poisoning after eating potatoes with a glycoalkaloid content of 236 mg per kg potatoes indicates, however, that symptoms of poisoning could be also possible with a glycoalkaloid level of 200 mg per kg potatoes.

The German Federal Institute for Risk Assessment (BfR) conducted a toxicological assessment of the available data and estimated on this basis the level from which glycoalkaloids in potatoes could possibly cause health impairments. Based on the currently available data, a NOAEL (No Observed Adverse Effect Level – the highest dose at which no undesired health effects were observed) of 0.5 mg per kg body weight and day was derived. To avoid an exceedance of this dose, the glycoalkaloid content in table potatoes should be lower than 100 mg per kg fresh weight. This also pays due consideration to especially sensitive population groups. The BfR recommends that the appropriate examinations on glycoalkaloid levels in potatoes be carried out.

To keep the glycoalkaloid content of cooked potatoes as low as possible, the BfR advises consumers to comply with the standard recommendations for the storage and preparation of potatoes. Potatoes should be stored in a cool, dark and dry place and green parts and so-called “eyes” should be generously removed. Old, dried up, green or sprouting potatoes, as well as potatoes with several green parts and snacks made from potato peelings, are not suitable for consumption. If consumers want to eat the skin along with the potato, only undamaged, fresh potatoes are fundamentally suited for this purpose. Small children in particular should not eat unpeeled potatoes. Consumers should not reuse the water in which potatoes have been boiled and deep-frying fat for potato products should be changed regularly. The BfR also advises consumers not to eat potato dishes that have a bitter taste.

		BfR Risk Profile: Solanine in potatoes (Opinion No. 010/2018)				
A	Affected groups	General population Children and adolescents			 	
B	Probability of a health impairment through the consumption of potatoes or potato products with a high solanine content (≥ 200 mg per kg)	Practically excluded	Unlikely	Possible	Probable	Certain
C	Severity of the health impairment through the one-off consumption of potatoes or potato products with a high solanine content (≥ 200 mg per kg)	No impairment	Slight impairment [reversible]	Moderate impairment [reversible]	Severe impairment [reversible/irreversible]	
D	Reliability of the available data	High: The most important data are available and are free of contradiction		Moderate: Some important data are missing or contradictory	Low: Numerous important data are missing or contradictory	
E	Controllability by the consumer [1]	Control not necessary	Controllable through precautionary measures	Controllable through avoidance	Not controllable	

Squares highlighted in dark blue indicate the properties of the risk assessed in this opinion (more detailed information on this is contained in BfR Opinion No. 010/2018 of 23 April 2018).

Explanations

The risk profile is intended to visualise the risk outlined in the BfR Opinion. It is not intended for the purpose of comparing risks. The risk profile should only be read in conjunction with the corresponding opinion.

[1] – Line E – Controllability by the consumer

The information in this line should not be seen as a recommendation from the BfR; it has a purely descriptive character. The BfR has given recommended courses of action in its opinion: The BfR advises consumers to minimise risks by observing the standard recommendations for the storage and preparation of potatoes.

BUNDESINSTITUT FÜR RISIKOBEWERTUNG (BfR)

The full version of this BfR opinion is available in German on <http://www.bfr.bund.de/cm/343/speisekartoffeln-sollten-niedrige-gehalte-an-glykoalkaloiden-solanin-enthalten.pdf>

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