

Fipronil in foods containing eggs: Estimations of maximum tolerable daily consumption

BfR Communication No. 019/2017 of 10 August 2017

The German Federal Institute for Risk Assessment (BfR) has prepared a health risk assessment based on limited available data on fipronil levels in foods (containing eggs) in Germany: <http://www.bfr.bund.de/cm/349/health-assessment-of-the-first-analysis-results-on-fipronil-levels-in-foods-in-germany>

Eggs are used to produce a large number of foods. The proportion varies among the different foods. Generally, a dilution of the fipronil concentration can be assumed for foods produced with the addition of eggs.

The BfR does not yet have any measured values for foods containing eggs. For this reason, a model calculation was made for various exposure scenarios and foods in order to draw conclusions on the maximum tolerable daily consumption of foods containing eggs at which no acute health risk is expected.

Background

Agricultural products are often not eaten raw but processed before consumption. Because of the dilution that occurs during the production process, it can generally be assumed that the fipronil levels in foods containing eggs are lower than in fresh eggs. Against this background, a model was calculated for fipronil to determine the maximum tolerable daily consumption level for children and adults at which no acute health risks are to be expected.

As the BfR does not yet have any measured values for foods containing eggs, a model calculation was made for three food groups, each of which includes typical foods with moderate and high proportions of eggs. The following fipronil levels in eggs were used as the basis here:

1. The highest concentration of fipronil per kg whole egg (worst case) reported to the BfR to date of 1.2 mg measured in Belgium.
2. A fipronil concentration of 0.72 mg per kg eggs calculated by the BfR at which the ARfD is not exceeded for any of the observed consumer groups, including children.
3. The highest concentration of fipronil in eggs reported to the BfR to date from Germany of 0.45 mg per kg eggs.

Data basis

The calculation of the maximum tolerable daily consumption levels for children and adults of selected typical foods with a moderate and high egg content is based on a 100 % utilisation of the acute reference dose (ARfD) for fipronil of 0.009 mg per kg body weight (bw) which was derived in the course of the EU procedure for the approval of active substances contained in plant protection products. Depending on whether the egg content of the foods is moderate or high, theoretical portion sizes result with which no acute health risk is to be expected for any of the examined consumer groups because the ARfD is not exceeded.

The basis for calculating the proportions of eggs in the consumed foods was provided by the German Food Code (BLS Version II.4) prepared by the Max Rubner Institute, as well as researched recipes (Hartmann et al. 2006).

Results

Maximum tolerable daily consumption was calculated for the given fipronil levels in eggs (Table 1). Typical foods with moderate and high proportions of eggs were observed here in three food groups. It has to be taken into account that the maximum tolerable daily consumption may not be regarded as the equivalent of the actual quantities consumed by the German population.

Table 1: Maximum tolerable daily consumption for children and adults of selected typical foods with moderate and high proportions of eggs based on a 100 % utilisation of the acute reference dose (ARfD) for fipronil of 0.009 mg/kg body weight (bw)

German Food Code (BLS) Main Group	Typical and maximum egg proportion within the food group	Assumed levels in chicken eggs in mg/kg	Maximum tolerable consumption per day in kg	
			Children (1 year old, 10 kg bw)	Adults (65 kg bw)
Dry baked goods and confectionery	Typical: 14% (cakes)	1.20 0.72 0.45	0.54 0.89 1.40	3.40 5.80 9.30
	Max: 59% (biscuits)	1.20 0.72 0.45	0.12 0.21 0.33	0.82 1.40 2.20
Eggs and pasta	Typical: 16% (potato dumplings)	1.20 0.72 0.45	0.46 0.78 1.20	3.00 5.00 8.00
	Max: 29% (egg pasta)	1.20 0.72 0.45	0.25 0.43 0.68	1.60 2.80 4.40
Sweets, sugar, chocolate, ice-cream	Typical: 8% (ice-cream mixed in a wafer cone)	1.20 0.72 0.45	0.93 1.50 2.50	6.00 10.00 16.00
	Max: 25% (chocolate bar filled with milk cream)	1.20 0.72 0.45	0.30 0.50 0.80	1.90 3.00 5.20

More information on the subject of fipronil in eggs at the BfR website

FAQ of 6 August 2017:

http://www.bfr.bund.de/en/frequently_asked_questions_about_fipronil_levels_in_foods_of_animal_origin-201492.html

Opinion of 5 August 2017:

<http://www.bfr.bund.de/cm/349/health-assessment-of-the-first-analysis-results-on-fipronil-levels-in-foods-in-Germany.pdf>

References

Hartmann BM, Bell S, Vásquez-Caicedo AL, Götz A, Brombach C (2006): Der Bundeslebensmittelschlüssel – Aktuelle Entwicklungen, Potenzial und Perspektiven. Ernährungs-Umschau 53, Heft 4: 124-129.

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.

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