

Still little knowledge on allergic reactions following insect consumption

Communication No. 29/2023 of 27 June 2023

In 2021, an insect species was approved for food production in the European Union for the first time, more precisely: the larva of the yellow mealworm (*Tenebrio molitor*). In the meantime, three additional species of insects have been approved, and the EU Commission has received further applications for approval. The extent to which the consumption of these foods can cause allergic reactions or trigger allergies is currently being scientifically investigated.

To date, only a few cases of allergic reactions have been reported following the consumption of foods containing insect meal. There are also currently no data on the frequency of food allergies to insects for Europe. The German Federal Institute for Risk Assessment (BfR) is not aware of any cases of severe allergic reactions in Germany to date. It must, however, be taken into account that the consumption of insect-based foods is still rare.

The larva of the yellow mealworm (*Tenebrio molitor*) was the first insect to be approved by the EU Commission on June 1, 2021. This was later followed by the migratory locust (*Locusta migratoria*, approved on November 12, 2021), the house cricket (*Acheta domestica*, on February 10, 2022) and the larva (lesser mealworm) of the litter beetle (*Alphitobius diaperinus*, in January 2023). The foods and preparations produced from them and described in the respective applications for approval may be marketed throughout the EU. Depending on the approval, the insects are used in dried, frozen, paste-like or powdered form. Foods made from or containing insects are novel foods and must therefore undergo an approval procedure in accordance with the rules of the EU Novel Food Regulation. Part of this procedure involves a health risk assessment by the European Food Safety Authority (EFSA). Approval by the EU Commission is only possible if this assessment does not give rise to any safety concerns.

For the insect species approved to date, EFSA has recommended in its opinions that further research be conducted on the allergenic potential of insect-based foods. The reason for this is that the limited evidence available suggests that the consumption of insect-based foods may lead to allergic sensitization and trigger allergic reactions to certain insect proteins. Experts assume that the consumption of insect foods might also cause allergic reactions in people who are allergic to crustaceans and house dust mites, due to the fact that certain proteins of the individual species are very similar to one another. Such cases are referred to by experts as cross-reactions.

How widespread food allergies to insects are is not known, at least for Europe. The few studies that have looked into this are mainly from East Asia, where the consumption of insects is more common. Also, only a few cases are known so far in which allergic reactions occurred after consumption of flour obtained from insects that have been approved in the EU.

Basically, allergic reactions may become evident on the skin, in the form of hives, itching, rashes or swelling. However, shortness of breath, respiratory asthma, nausea, diarrhea or, in the worst case, anaphylactic (=allergic) shock can occur, which is potentially life-threatening. In the anaphylaxis registry "ANAPHYLAXIE.NET", a joint database for Germany, Austria and Switzerland, no corresponding cases have been reported to date following the consumption of insect foods, according to an enquiry by the BfR (as of 10.03.2023).

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Also in the poisonings database of the BfR, which records poisonings and suspected poisonings related to food on the basis of voluntary reports, no case of health complaints caused by insect-based foods has been registered (with the exception of honey).

When considering health risks, it must be taken into account that the market with insect-based foods has so far been a niche market. This means that the number of people eating such foods is currently likely to be low.

Further Information on the BfR website on the subject of insects in food:

Research Project on Safety Aspects of Edible Insects:

<https://www.bfr.bund.de/cm/349/research-project-on-safety-aspects-of-edible-insects.pdf>

Food allergy caused by insects?

<https://www.bfr.bund.de/cm/349/food-allergy-caused-by-insects.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. The BfR advises the Federal Government and the States ('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.