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## Botulism risk through salted and dried roach

BfR Opinion No.026/2017 of 11 September 2017

Botulism is a serious disease caused by botulinum neurotoxins. These toxins are mainly formed by bacteria of the species *Clostridium botulinum* and ingested with food. The disease usually leads to specific neurological disorders, such as impaired vision, dry mouth, speech and swallowing difficulties, and can be fatal.

Several cases of botulism in humans were reported in Germany and Spain at the end of 2016 which were traced back to the consumption of salted and dried roach. Once the botulism cases were recognised, the suspect goods were recalled from the supplied companies, and in the affected countries public warnings were issued against the consumption of these goods. For this reason, the German Federal Institute for Risk Assessment (BfR) has estimated the occurrence and behaviour of *Clostridium botulinum* in gutted and ungutted, salted and dried roach on the basis of literature studies and mathematical models.

The risk for humans of contracting botulism depends on the health status of the caught roach as well as its further treatment, processing, and the manner of preparation. The results show that *Clostridium botulinum* type E can occur in low concentrations in the intestines of roach, where it can propagate and form botulinum neurotoxins without the fish being recognisably spoiled. It is possible that the bacteria continue to propagate and form neurotoxins, depending on the storage temperature and type of further processing until consumption. The propagation of the bacteria and formation of neurotoxins can be stopped by sufficient refrigeration as well as proper salting and drying of the fish which significantly reduces the water content. The risk of contracting botulism increases if the offal of insufficiently heated roach is also eaten.

Therefore, the BfR recommends to gut roach carefully and completely soon after the catch followed by thorough rinsing on the inside and outside. In addition to this, roach should be stored at a maximum temperature of 3 °C prior to salting, additionally cooled during salting for several days and sufficiently salted prior to drying above 8 °C. The BfR recommends that consumers only eat salted and dried roach that have been sufficiently heated for at least ten minutes with a core temperature of 85 °C or above. The offal of insufficiently heated roach should not be eaten.

As the BfR has no information on the production of the rejected batches or on the frequency of consumption of salted and dried roach, a comprehensive scientific risk assessment is not possible. This assessment takes into account the uncertainties that exist with regard to the production methods, which can be very different, as well as the prognosis models. No experimental studies are currently available on the behaviour of *Clostridium botulinum* along the process chain of gutted and ungutted salted and dried roach.

BfR Risk Profile: Botulism through salted and dried roach (Opinion No. 026/2017)	
<b>A Affected groups</b>	General population 
<b>B Likelihood of botulism through the consumption of salted and dried roach[1]</b>	Practically excluded      Unlikely <b>Possible</b> Probable      Certain
<b>C Severity of health impairment through the consumption of salted and dried roach[2]</b>	No impairment      Slight impairment      Moderate impairment      Severe impairment
<b>D Reliability of available data[3]</b>	High: The most important data are available and free of contradiction      Moderate: Several important data are missing or contradictory      Low: Numerous important data are missing or contradictory
<b>E Controllability by the consumer[4]</b>	Control not necessary <b>Controllable through precautionary measures</b> Controllable through avoidance      Not controllable

Boxes highlighted in dark blue indicate the properties of the risk assessed in this opinion (more detailed information on this is contained in the text of BfR Opinion No. 026/2017 of 11 September 2017).

**Explanations**

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

**Column B – Likelihood of a health impairment**

[1] – The likelihood of contracting botulism depends on whether and to what extent the salted and dried roach contain bacteria of the type *Clostridium botulinum*, as well as the further processing of the fish and the manner in which it is prepared. The risk increases if insufficiently heated roach or their offal are consumed.

**Column C – Severity of the health impairment**

[2] – The severity of the disease depends on the type and quantity of ingested Botulinum neurotoxins. Light illnesses with gastrointestinal symptoms all the way through to fatalities are possible.

**Column D – Reliability of available data**

[3] – The BfR has no information on the frequency of consumption of roach or on the processing methods, which can vary depending on the manufacturer. The same applies to the experimental studies which were necessary to better estimate the behaviour of *Clostridium botulinum* strains and botulinum neurotoxins along the process chain of salted and dried roach.

**Column E – Controllability by the consumer**

[4] – The information given in the column “Controllability by the consumer” has a descriptive character and should not be seen as a BfR recommendation. The BfR gives recommended courses of action in its opinion. The BfR recommends compliance with the cold chain and advises against the consumption of insufficiently heated salted and dried roach and their offal. The manufacturers are responsible for the quality of roach products. As the propagation of *Clostridium botulinum* Type E does not give any indications that the food is not fit for consumption, this cannot be recognised by food companies or consumers.

The full version of this BfR opinion is available in German on <http://www.bfr.bund.de/cm/343/botulismus-risiko-durch-gesalzene-und-getrocknete-ploetzen.pdf>

### **About the BfR**

The German Federal Institute for Risk Assessment (BfR) is an independent scientific research institution within the portfolio of the Federal Ministry of Food and Agriculture (BMEL). 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.

The BfR is celebrating its 15th anniversary this year. To mark the occasion, the institute has published a jubilee brochure which can be downloaded at <http://www.bfr.bund.de/en/publication/brochures-61045.html>.

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