



Edible insects on the Belgian market

Claeys W., Verraes C., Ngonlong Ekende E., Van Huffel X. & Lefevre V.

Federal Agency for the Safety of the Food Chain (FASFC), DG Control Policy, Kruitdunlaan 55, B-1000 Brussels, Belgium

Introduction

Insects intended for human consumption or 'edible' insects, also referred to as 'micro livestock' or 'mini livestock', could offer great potential in the search for alternative dietary protein sources. Presently, there is however **legal uncertainty** as to whether whole insects or preparations thereof (e.g. worm paste) fall within or outside of the scope of the Novel Food Regulation (EC) N° 258/97 [1]. According to this Regulation, foods or food ingredients which have not been used for human consumption to a significant degree within the European Union before 15 May 1997 are **novel foods** or **novel food ingredients** and must receive an authorization of the European Commission before they may be placed on the Community market.

Risk assessment

Edible insects are quite nutritious, but like vertebrates, may contain pathogens (fungi, bacteria, parasites, etc.) and toxic substances which can be hazardous to health when consumed.

An assessment of the **potential microbial, chemical (including allergens) and physical hazards** specifically related to the consumption of insects (entomophagy) performed by the Scientific Committee (SciCom) of the Belgian FASFC and the Superior Health Council (SHC) [2], shows that the potential risks **may be largely controlled by the correct application of good hygiene and manufacturing practices during the breeding and marketing of insects**.

Nevertheless, a **heating step** before consumption is strongly recommended as well as appropriate storage and preparation conditions. Persons who are allergic to shellfish and/or dust mites are warned for a **possible allergic reaction** to eating insects.

Similar conclusions were drawn in the risk assessments performed by the Netherlands Food and Consumer Product Safety Authority (NVWA) [3] and the French Agency for Food, Environmental and Occupational Health & Safety (ANSES) [4]. Currently, a working group within the Scientific Committee and Emerging Risks Unit of the European Food Safety Authority (EFSA) is elaborating an opinion on the safety risks from insects as food and feed (question number EFSA-Q-2014-00578).



Insects currently tolerated on the Belgian market

Latin name	English name	Stage of development at the time of consumption
<i>Acheta domestica</i>	house cricket	adult (imago)
<i>Achroia grisella</i>	lesser wax moth > wax moth worm	caterpillar
<i>Alphitobius diaperinus</i>	litter beetle* > lesser mealworm	larva
<i>Alphitobius laevigatus</i>	buffalo worm > lesser mealworm	larva
<i>Bombyx mori</i>	Silkworm > silkworm	pupa (without cocoon) & caterpillar
<i>Galleria mellonella</i>	greater wax moth > waxworm	caterpillar
<i>Grylodes sigillatus</i>	banded cricket	adult (imago)
<i>Gryllus assimilis</i>	field cricket	adult (imago)
<i>Locusta migratoria</i>	African migratory locust	larva & adult (nymph & imago)
<i>Schistocerca americana</i>	American desert locust	adult
<i>Tenebrio molitor</i>	yellow meal beetle > yellow mealworm	larva
<i>Zophobas atratus</i>	morio beetle > morio worm ('superworm')	larva

* Next to lesser mealworm, the larva of the litter beetle is often (wrongly) referred to as buffalo worm

Belgian policy

Pending a clear European legislation, the Belgian FASFC currently tolerates 10 insect species on the Belgian market [5]. This tolerance does not apply to ingredients that were isolated or extracted from insects, such as protein isolates. Operators who wish to market insect species other than the 10 tolerated ones, need to follow the novel foods procedure.

Main requirements for the marketing of insects:

- Operators breeding, producing or marketing edible insects or insect-based foods have to be **registered** at the FASFC and/or require a FASFC **authorization**.
- The performed activities must comply to the **general rules of the food legislation**, amongst which the application of good hygiene practices, traceability, compulsory notification, labeling and establishment of a self-checking system based on the HACCP principles. The breeding of insects is subject to the rules applicable for primary production, including the feed legislation.
- As there are no specific regulations for the production and commercialization of insects intended for human consumption, the **microbiological criteria** for 'comparable' food products mentioned in Regulation (EC) N° 2073/2005 [6] could be considered as possible food safety and process hygiene guideline values.

Specific recommendations to be taken into account:

- **cleaning & disinfection** of the nursery area, livestock and equipment (at least after each culture cycle);
- regular **removal of faeces and individual deaths** (to the extent possible and with the exception of the waxworm *Galleria mellonella*);
- regular **replacement of feed and water** (unless manipulation of the feeding bed is not appropriate for the development of the insects);
- a **strict separation** between the production chain of insects intended for food and of insects intended for animal feed (pets);
- when pharmacological substances (e.g., veterinary medicines) are administered, Regulations (EU) no. 37/2010 [7] and (EC) no. 470/2009 [8] should be respected;
- **heating** (blanching, cooking, oven drying) before marketing the product (note: as spore-forming bacteria pose a potential risk, a heat treatment such as sterilization is strongly advised);
- periodical **testing** for the presence of possible pathogenic bacteria;
- suitable **storage conditions**.



More clarification on the currently prevailing regulations and national requirements concerning the breeding, the marketing and the import of insects and insect-based foods is given in a **circular published on the FASFC's website** [5].

References

- [1] Regulation (EC) N° 258/97 of the European Parliament and of the Council of 27 January 1997 concerning novel foods and novel food ingredients. See also: FPS Public Health, Food Chain Safety and Environment: <http://www.health.belgium.be/eportal/foodsafety/foodstuffs/novelfoods/index.htm#VYQT2JVVQB>
- [2] Common advice SciCom 14-2014 & SHC nr. 9160. (2014). http://www.favv-afsc.fgov.be/scientificcommittee/advices/documents/ADVCE14-2014_ENG_DOSSIER2014-04.pdf
- [3] NVWA. (2014). <http://www.nvwa.nl/onderwerpen/risicobeoordelingen/bestand/2207475/consumptie-gekwekte-insecten-advies-buro>
- [4] Anses. (2015). <https://www.anses.fr/en/system/files/BIORISK2014sa0153EN.pdf>
- [5] FASFC. <http://www.favv-afsc.fgov.be/foodstuffs/insects/>
- [6] Commission Regulation (EC) N° 2073/2005 of 15 November 2005 on microbiological criteria for foodstuffs.
- [7] Commission Regulation (EU) N° 37/2010 of 22 December 2009 on pharmacologically active substances and their classification regarding maximum residue limits in foodstuffs of animal origin.
- [8] Regulation (EC) N° 470/2009 of the European Parliament and of the Council of 6 May 2009 laying down Community procedures for the establishment of residue limits of pharmacologically active substances in foodstuffs of animal origin.

