Insects – rearing and use as feed and food in Denmark and the EU – what is allowed and what is not?

This document outlines the legislation for rearing and processing insects as feed and food in Denmark. The legislation is mostly based on EU regulations. In this document the definition of insects also includes other arthropods such as spiders and scorpions, which are not insects according to the biological definition.

Rearing of insects – primary production

Farmers rearing insects for food and feed must be registered as a farmer/primary producer. The registration must be done at Landbrugsindberetning.dk (Danish), in the section “Foder og fødevarer”.

Primary production is defined as production of the insects until the first sale of the living insects. This means that if a primary producer wants to slaughter the insects himself, treat them in one way or another and then sell them, these activities must be registered or approved separately by the Danish Veterinary and Food Administration as they are not a part of the primary production (see the following section).

Farmers of insects must comply with the general rules for hygiene for primary production of feed and food. This means e.g. that the company must make an assessment as to where in the production contamination may occur and how to prevent hazards.
Treatment of insects after primary production

If a primary producer wants to slaughter and maybe treat the insects (e.g. freeze dry, fry or grind them) before they are sold, these activities must be registered or approved separately by the Danish Veterinary and Food Administration in accordance with special rules on feed and food hygiene respectively.

Registration

Guidance on registration and approval as feed company can be found here: Registrering og godkendelse af fodervirksomhed, herunder landbrug (Danish). Please be aware that insects may only be used as feed under certain circumstances. (See section on “Rules for the use of insects as feed”)

An establishment that wants to produce feed from insects shall be approved according to the animal by-products Regulation¹ Read more in the section “Virksomheder og anlæg, som skal godkendes” (Danish).

Guidance on registration as a food business operator can be found here: Starting a food business in Denmark. Please be aware that when you want to start a food business slaughtering or preparing insects for food you must not use the form mentioned on the webpage but must contact the Danish Veterinary and Food Administration by phone or in writing, see contact information.

Layout and hygiene

The general hygiene conditions in the feed and food hygiene regulations apply for rearing of insects.

In general the company must make sure it has the necessary facilities, e.g. for slaughtering the insects and possibly for further treatment like heat treatment, packing and storage, until the insects are sold. If the insect products have to be cooled and kept cold, there must be the necessary facilities to do this. Rooms, equipment etc. should be appropriately placed and adapted so cleaning and if necessary disinfection can be done properly. The necessary protection against pests should be in place.

In the case of frozen foodstuffs, the supplementary provisions regarding production date in the hygiene regulation for animal foodstuffs also applies. Regarding import the supplementary provisions in the hygiene regulation for animal foodstuffs also apply.

Requirements for the feed for the reared insects

When insects are farmed for use as feed and food, they are considered as farmed animals like ruminants, pigs and poultry. Feed for animals must comply with the feed regulation. According to the marketing regulation², feed must be safe, must not have a direct adverse effect on the environment or on animal welfare, and it must be sound, genuine, unadulterated and fit for purpose. Furthermore, there are a number of restrictions on what can be used as feed.


As other farmed animals insects can be fed with traditional feed like grain, soybean meal, silage and residues from fruit, vegetables and bread.

On the other hand, insects, like other farmed animals, must not be fed or farmed on animal by-products, e.g. remains of meat or fish, kitchen waste, manure, waste from purification plants and the like.

Guidance on good practise when feeding food producing animals can be found here: Fodring af heste og landbrugsdyr (Danish).

Rules of the Nature Protection Regulation

It should according to the nature protection regulation be ensured that insects not resident in Denmark cannot escape to nature. The nature protection regulation is administered by The Danish Environmental Protection Agency. Regarding import of insects one must also make sure that this happens in accordance with the rules of the Danish Environmental Protection Agency.

Rules for use of insects as feed

The rules for using insects as feed are different depending on whether the insects are alive or dead.

Live insects as feed

According to the feed legislation, there is no ban on feeding non-ruminant e.g. pigs and poultry animals with live insects, provided that the insects are farmed on materials that may be used as feed for farmed animals. It is not allowed to feed ruminants e.g. cattle, sheep and goats with live insects.

Dead insects as feed

Dead insects may be used to produce 2 different types of feed materials: 1) “processed animal protein” which are the protein fraction and 2) rendered fat which is the fat fraction. Processed animal protein is currently allowed for aquaculture, pet and fur animals. At the moment it is not allowed to use “processed animal protein” of insects for pigs, poultry and ruminants. It is allowed to use the feed material “rendered fat” of insects to all animal species including insects.

The processing of processed animal protein of insects must only occur on approved plants according to the animal by-product regulation 1069/2009, and the plants must be dedicated exclusively to the production of products derived from farmed insects. There are only 7 insect species allowed to be used for processed animal protein for aquaculture animals:

1. Black Soldier Fly (Hermatia illucens)
2. Common Housefly (Musca domestica)
3. Yellow Mealworm (Tenebrio molitor)
4. Lesser Mealworm (Alphitobius diaperinus)
5. House cricket (Acheta domesticus)
6. Banded cricket (Gryllodes sigillatus)
7. Field Cricket (Gryllus assimilis)
Feed for pet animals (such as dogs and cats) and fur animals (such as mink) may contain insects of other species than those mentioned above. The processed animal protein of all insects for pet and fur animals must always be a safe feed for the animals.

The rules are set out in the TSE Regulation\(^3\), which has the aim of controlling and preventing diseases related to mad cow disease. Annex IV of the TSE regulation contains provisions regarding which feed materials of animal origin may be fed to different types of species.

The rules are also laid down in the regulations on animal by-products\(^4\) and Regulation (EU) 142/2011\(^5\), which contain rules on which animal by-products that are allowed to be used to produce feed for animals, and how animal by-products, including dead insects, shall be processed.

The marketing regulation\(^6\) states that, animal feed must be safe, and that it must not adversely affect animal welfare. In addition, the feed must be fit for purpose. The operator marketing the feed is responsible for ensuring that these requirements are met.

In addition a company who markets insects as feed must ensure that the insects are either included in the EU catalogue of feed materials or reported to the feed register. Both also appear on the Danish Veterinary and Food Administration website.

Legal matters relevant for feed companies can be found on the Danish Veterinary and Food Administration website and in the guidance document “Vejledning om foder og fodervirksomheder” (Danish).

In October 2015 the EU Food Safety Authority (EFSA) published the report "Risk profile related to production and consumption of insects as food and feed" on possible risks of the use of insects as food and feed.

All the legislation for feed can be seen on the Danish Veterinary and Food Administration website.

**Import of processed animal protein from insects as feed**

In the case of imports from countries outside EU, all batches of processed animal protein of insects and compound feeding stuffs containing processed animal protein of insects shall be accompanied by health certificates. A model of the health certificate can be found in Chapter 1a of Annex XV to Regulation 142/2011.

Import of processed animal protein from insects and compound feeding stuffs containing the processed animal protein from insects, there must comply with the requirements in the TSE

---

\(^3\) Regulation (EC) No 999/2001 laying down rules for the prevention, control and eradication of certain transmissible spongiform encephalopathies  
\(^6\) Regulation (EC) No 767/2009 on the placing on the market and use of feed
legislation, which means, that there must be evidence that the feed does not contain ruminant material.

**Food Application**

According to the EU novel food regulation\(^7\), food which has not been consumed to a significant degree in the EU before 15 May 1997 must be risk assessed and approved before marketing. This is to ensure that consumers are not exposed to health risks.

In the determination of novel food status it is important to use the correct name and identification, this means the insect name (including the Latin name), insect development stage (eggs, larvae, pupae or fully developed insects), and which parts of the insects (body, wings, legs, entire animal or other) that are used. Any treatment of the insects (e.g. milling or extraction) is also relevant.

No insects have been shown to have been consumed to a significant degree in the EU before 1997, therefore insects as food must be risk assessed and approved before they can be marketed in the EU.

However, there is a legal uncertainty in the existing novel food regulation\(^7\) with regards to whether or not whole animals and thereby insects are covered. According to categories in the text of the Regulation, includes food ingredients "isolated from animals", which according to Danish Veterinary and Food Administration legal interpretation cannot be said to include ingredients consisting of whole animals.

The uncertainty also applies if the whole insects are chopped or otherwise comminuted, since these products are still not isolated from animals. It is a prerequisite that e.g. wings or other parts of the animals have not been removed, and that it can be proven that the whole animals were used.

Thus the Danish Veterinary and Food Administration currently allows marketing of insects as food in Denmark, provided that whole animals are used and that the products comply with all other aspects of the food legislation.

Marketing of products isolated from insects (other than whole animals) requires risk assessment and approval under the EU novel food regulation. An application should be forwarded to the competent food authority in the Member State where the product is first to be marketed. In Denmark the application is submitted to the Danish Veterinary and Food Administration.

Information about submitting a novel food application can be found on the Danish Veterinary and Food Administration website concerning novel food (Danish).

\(^7\) Regulation (EC) No 258/97 concerning novel foods and novel food ingredients
Due to the legal uncertainty in the current regulation there are different interpretations in different EU member countries regarding the marketing of whole insects. The updated novel food regulation\textsuperscript{8} which will apply from 1 January 2018, makes it legally clear that whole animals, including insects, are subject to the novel food regulation.

Marketing of whole insects in the period before the new regulation applies does not mean that products are exempt from the rules applying from 1 January 2018, and an application for approval of marketing of insects should be submitted after this date. However, there is a transitional period for products which were legally on the market before 1 January 2018.

According to the new novel food regulation foods not falling within the scope of Regulation (EC) No 258/97, which were lawfully placed on the market before 1 January 2018 and which fall within the scope of the new regulation may continue to be placed on the market until a decision is taken following an application for authorisation of the novel food. The application must be submitted by the date specified in the implementing rules adopted in accordance with Article 13 or 20 of the new regulation, but no later than 1 January 2019\textsuperscript{9}.

With regard to whole insects the transitional measures mean that if a type of insect was legally marketed as food in Denmark before 1 January 2018, this type of insect may continue to be marketed in Denmark in the above-mentioned transitional period. An import permission from the Danish Veterinary and Food Administration for marketing of the insect together with documentation, that the insect products were actually imported before 1 January 2018 for marketing purpose as a food, will be regarded as sufficient proof of legal marketing.

The transitional measures are valid for the type of food marketed and are not related to specific companies. It is therefore possible to change importer or producer of insects after 1 January 2018. The Danish Veterinary and Food Administration will in January 2018 publish a list of the types of whole insects covered by the transitional measures in Denmark.

Besides the above, the general rules of food legislation apply, meaning that it is the responsibility of the company marketing a food to ensure that the food is not unsafe, i.e. injurious to health or unfit for human consumption. This means that all food business operators must perform a risk analysis on their products, in which the content of potentially harmful substances in the food either due to natural occurrence or due to contaminants, among other things, is taken into account.

With the new novel food regulation\textsuperscript{10}, which fully apply from 1 January 2018, an additional simplified application procedure, apart from the regular one, is introduced for foodstuff, that have a long history of safe use as a food in a third country. The simplified procedure can be used if the food has a documented history of safe use in at least one third country, meaning that the food must have been a part of the customary diet for at least 25 years in a significant number of people in that country.

The European Commission is in the process of drafting the necessary implementing measures, which will show how applications are submitted and processed under the new rules. Read more

\textsuperscript{8} Regulation (EU) 2015/2283 on novel foods

\textsuperscript{9} According to the proposal for implementing measures the deadline for submission of an application will be 1 January 2019 at the latest.
about the new novel food regulation on the Danish Veterinary and Food Administration website (Danish).

Food safety

Besides the above the general rules of the food legislation apply meaning that it is the responsibility of the operator to ensure that the foods they market are not unsafe, i.e. injurious to health or unfit for human consumption. This means that all food business operators must perform a risk analysis on their products, in which the content of potentially harmful substances in the food either due to natural occurrence or due to contaminants, among other things, is taken into account.

Information about the correct name of the insect, including the Latin name, is a requirement. If there are any requirements concerning correct use or preparation of the insect, this should also be stated on the label.

When applying for approval of import of insects, a risk analysis must be submitted (read more in the section on import).

In October 2015 the EU Food Safety Authority (EFSA) published the report "Risk profile related to production and consumption of insects as food and feed" on possible risks of the use of insects as food and feed.

The risks mentioned in this report are amongst others:

- risk of pathogenic microorganisms in the products
- chemical og physical contamination from the environment, including the feed used
- residues of antibiotics or other pharmaceuticals that have been used in the farming
- content of natural toxins, e.g. toxic substances excreted by the insects
- content of sharp parts, e.g. wings from a grasshopper that potentially could harm the digestive tract
- allergy

The above mentioned is not an exhaustive list of potential risks, but examples of what should be taken into account when making a risk analysis. The relevance of the risks mentioned in the EFSA report depends on the specific insect. When making the risk analysis it is also relevant to include information about consumption of the insect in countries outside the EU and if any adverse health effects have been seen in connection with this.
Because of the risk of presence of pathogenic microorganisms in the products, it is advisable to heat-treat insects before they are consumed.

**Import of insects as food from other countries**

Insects used as food are considered animal products. Insects are non-EU harmonized products (there are no common production and import conditions in the EU) meaning that each EU country must set its own conditions and requirements for import. This is the case for import of insects from both third countries and other EU countries.

If you want to import insects for food use in Denmark you have to obtain permission from the Danish Veterinary and Food Administration before doing so (according to the Danish order on veterinary control\(^\text{11}\)). The application for permission must be sent to the local Danish Veterinary and Food Administration department situated in the same area where the importer is situated.

The application for permission on import of insects for food use must contain a risk analysis of the product. Additionally it should be described how the risks identified in the analysis will be controlled. The application should contain the following information:

- The correct name of the insect, including its Latin name
- Any special circumstances concerning the correct use of the product, e.g. preparation requirements and how this will be communicated to the consumer
- Results of all relevant analyses carried out (e.g. bacterial count, pesticide residues, heavy metals etc.) depending on the risks identified in the risk analysis concerning the specific product.

The insects must originate from a business or production site that is approved or registered by the local authorities in the country of origin. Products imported from third countries must be accompanied by a certificate from the competent food authorities in the concerned country, certifying all relevant food safety issues and conditions. Imported products will be subject to veterinary control at the border control point of their first point of entry into EU. The procedure for this veterinary control can be seen in the Danish order on veterinary control.

Private import of insects for one’s own use is exempt from veterinary control provided that the products are transported in one’s own baggage upon arrival to the country or in direct connection with one’s travel or if the products are received as parcels and comply with the following maximum quantities:

1. Import from EU-countries, Norway, Lichtenstein, Andorra and Switzerland: No maximum amount.
2. Import from Iceland, The Faroe Islands and Greenland: Maximum 10 kg per person.
3. Import from all other countries than EU-countries, Norway, Lichtenstein, Andorra, Switzerland, Iceland, The Faroe Islands and Greenland: 0 kg per person (private import is not permitted)

---

\(^{11}\) Danish order no 1570 of 12 December 2016 on veterinary inspection on import of food of animal origin (in Danish)
The maximum import quantities mentioned in point 2 and 3 appear in article 2 of Regulation (EC) No 206/2009\textsuperscript{12}.

\textsuperscript{12} Regulation (EC) No 206/2009 on the introduction into the Community of personal consignments of products of animal origin