

Guidance on regulations on farming insects in Scotland to produce sustainable protein

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Interest in farming insects to bio-convert organic food and drink sector surplus into low carbon, sustainable protein for livestock feeds and other valuable products has grown rapidly at a global scale in the last few years.

The EU legislative framework is implemented and enforced across the UK through separate domestic regulations in Scotland, England, Wales and Northern Ireland. The following document aims to map the existing framework, and inform future discussions between regulators, licensing authorities, industry, and stakeholders within the UK.

What species can be farmed in the UK?

Insects are currently listed as “terrestrial invertebrates” in the European Feed Materials Register. However, only species that are not pathogenic, do not have other adverse effects on plant, animal or human health, and are not protected or defined as invasive species, may be farmed in the European Union and UK¹.

Based on this, the permitted species are:

1. Black Soldier Fly (*Hermetia illucens*)
2. Common Housefly (*Musca domestica*)
3. Yellow Mealworm (*Tenebrio molitor*)
4. Lesser Mealworm (*Alphitobius diaperinus*)
5. House Cricket (*Acheta domesticus*)
6. Banded Cricket (*Gryllobates sigillatus*)
7. Field Cricket (*Gryllus assimilis*)

Do I need a licence to farm insects?

If the breeding or rearing uses more than 5kg of animal or vegetable matter per week, it is controlled², and is considered as a prescribed activity for which you will require a Pollution Prevention and Control (PPC) Part B permit from [SEPA](#), and the DEFRA statutory guidance on insect installations³ should be carefully considered and complied with. Similarly, producers of insects intended for animal feed use (for aquaculture or pet food) must be registered as ‘Feed Business Operators’ (FeBO) before national competent authorities such as trading standards. Depending on the specific nature of your business and substrate, a Waste Management Licence* may be required and you may have to register as a collector and transporter of waste**. Further guidance is available from SEPA.

I farm insects...am I a farmer?

As a general rule, any operations producing, and/or rearing insects are considered primary producer farms (i.e. animals kept for the production of feed, food, or other derived materials such as wool, hide etc.) according to EU food and feed legislation⁴. However, this status changes at the point of harvest as subsequent processes result in a material change to the primary product. At this point, the primary producer becomes a processor and additional legislation is applied.

What can I feed them?

Because farmed insects are classed as farm animals, they are subject to the same rules of rearing and breeding⁵, prohibitions⁶, feeding⁷ and feed restrictions⁸ as traditional livestock species. Very broadly, suitable insect feed can be defined as vegetal pre-consumer agri-food residues known as ‘former food products’ which have lost their commercial value on the human consumption market but have retained their nutritional value for animal feed purposes***. This includes ingredients such as out-of-specification food, crisps or breakfast cereals; leftover dough and liquid chocolate, surplus bread collected from retailers and bakeries and so on. All materials should be sourced from businesses which are registered as FeBO and must comply with registration and approval requirements for feed businesses⁹.

Use of processed animal proteins (except fishmeal), catering waste, meat-and-bone meal and manure, or any products from food industries which may have been in contact with these materials, is strictly prohibited. There are some exceptions, including milk, eggs, honey and derivative products.

¹ APHA Guidance ² Pollution Prevention and Control (Scotland) Regulations 2012 ³ Statutory Guidance for maggot breeding Installations 2013 ⁴ Animal by-products regulations Article 3(6) [EC] No 1069/2009 ⁵ Animal by-products regulations Article 3(6) [EC] No 1069/2009 ⁶ TSE prevention, control and eradication [EC] No 999/2001 ⁷ Animal by-products regulations Annex IV (EU) No 142/2011 ⁸ TSE prevention, control and eradication Regulation [EC] 1069/2009: Article 10 page 27 ⁹ Undesirable substances in animal feed 2002/32/EC ¹⁰ Animal by-products [EC] 1069/2009 ¹¹ Implementing Regulation (EU) 142/2011

* <https://www.gov.uk/waste-management-licence-scotland> **<https://www.sepa.org.uk/regulations/waste/waste-carriers-and-brokers/#four> ***European Former Foods Foodstuffs Association

For guidance, any products of animal origin are always subject first to the provisions of the EU Animal By-Product Regulations¹⁰ and its accompanying implementing regulation¹¹.

For reference, the Catalogue of Feed Materials¹² has a comprehensive guide to permitted feedstocks, and guidelines to facilitate use of certain food no longer intended for human consumption are also available¹³. Foods that have passed their best before dates and use by dates can be used as feed, as can foods that are visually imperfect, have damaged packaging, are spoiled, mouldy and decomposing, provided they are used in accordance with food safety standards including the ABP regulations.

General food laws¹⁴; safety laws¹⁵, hygiene laws¹⁶; registration requirements¹⁷, marketing and labelling laws¹⁸, sampling requirements¹⁹, contaminant controls²⁰ microbiological criteria²¹, and feed laws²² apply to all feed business operators including primary producers, and therefore, also to the breeding and rearing of insects. It is the operators' responsibility to keep records of the species of insects used in production, the source and composition of compliant feedstocks, measures taken to control any potential hazards, and the businesses that have been supplied with products. Full traceability across the supply chain is mandatory, and operators should be able to produce this information on demand.

What are the welfare requirements when farming insects?

The Animal Health Law²³ establishes biosecurity measures for operators keeping animals and establishes responsibilities for the operators in the area of animal health and biosecurity.

Invertebrates are not currently considered under EU animal welfare legislation that normally applies to animal breeders²⁴ and therefore they appear to be exempt from any legal obligations in Scotland. However, in England they are covered by the Welfare of Animals at the Time of Killing (WATOK) Regulations²⁵ (England) 2015. Regardless, the Farm Animal Welfare Committee (FAWC) Five Freedoms²⁶ are still critical, and the Scottish WATOK framework (2012)²⁷ should still be consulted. The International Platform for Insects as Feeds and Foods (IPIFF) organisation has produced best practice guidance²⁸.

What regulations apply when processing insects for feed?

Firstly, the business will also have to be registered as a Feed Business Operator (FeBO) with the relevant local trading standards authority, the competent authorities for feeds (Food Standards Agency/Food Standards Scotland), and would also need to be approved by the Animal and Plant Health Agency (APHA). Guidance on the type of activity and registration requirements is available²⁹.



¹² Catalogue of animal feeds [EU] 2017/1017 ¹³ Guidelines for the feed use of food no longer intended for human consumption [EU] 2018/C 133/02 ¹⁴ Guidance to compliance with general Food Law [EC] No 178/2002 ¹⁵ Hygiene of Foodstuffs [EC] No 852/2004 ¹⁶ Hygiene of Foodstuffs [EC] No 852/2004 ¹⁷ Requirements for Feed Hygiene [EC] No 183/2005 ¹⁸ On the Placing on the Market and use of Feeds [EC] 767/2009 ¹⁹ Methods of sampling and analysis for the official control of feed Regulation [EC] 152/2009 ²⁰ Undesirable Substances in Animal Feeds Directive 2002/32/EC ²¹ Microbiological criteria for Food [EC] 2073/2005 ²² Requirements for Feed Hygiene [EC] No 183/2005 ²³ On Transmissible Diseases and Animal Health [EU] 2016/429 Article 10 ²⁴ Protection of animals kept for farming purposes 98/58/EC ²⁵ Welfare of Animals at Time of Killing (England) 2015 ²⁶ Five Freedoms Guidelines ²⁷ Welfare of Animals at Time of Killing (Scotland) 2012 ²⁸ Ensuring High Standards of Welfare in Insect Production ²⁹ Guidance for Starting a Feed Business

The insects must be processed in establishments that are specifically approved for that purpose, so the potential biological risks associated with such products are appropriately managed, including the facilities and equipment, personnel, storage and transport operations, sampling plans, record keeping, complaints and product recalls³⁰. Further to this, where insects are processed on a site also producing non-insect processed animal proteins then there must be complete separation throughout the entire processing chain, and the processing plant must be approved in line with the [Operations Manual procedures for Animal By-product processing plants](#) including validation and microbiological testing.

Controls must also be in place to prevent contamination of the finished product. These include management of personnel, equipment, designation of clean and unclean sectors, cleaning and disinfection of equipment and buildings, product flow and dedicated storage.

Finished products must therefore be stored in new or sterilised bags, or stored in properly constructed bulk bins, or in storage sheds. For labelling conventions, the insects can be classed as Feed Materials “Terrestrial Invertebrates” so where they are used to manufacture a compound feed, as described in [Regulation 767/2009](#), then normal labelling would apply³¹.

What animals can I feed insect protein to?

Since the TSE regulations³² were implemented, farmed animal-derived proteins are banned for use in feed for ruminants (such as cows) and some monogastric animals (such as pigs and poultry). However, fish and pets (such as dogs, cats, birds or reptiles) can be fed with such products after the European Food Safety Authority (EFSA) eased restrictions. The exception to this is where insects are fed live.



³⁰ ABP 1069/2009 ³¹ On the placing on the market and use of feed EC/767/2009 ³² TSE prevention, control and eradication [EC] No 999/2001

Feeding with Live Insects?

Live insects can also be used as animal feed. The list of those which are allowed is not limited to the seven species listed earlier (for farming of insects which are not fed live³³). The regulations regarding what live insects can be fed on, and what they can be fed to, would still apply³⁴.

What about the co-products?

Fats and oils

The insect oils in the [Feed Materials Catalogue](#) would fall under 9.2.1 Animal Fats and can be used on the same basis as animal fats are permitted. There is a compulsory declaration for 'crude fat' and if 'moisture is > 1%'. Retailers often restrict the use or level of tallows, fats and lards³⁵.

Chitin and Chitosan

The exoskeletons of insects are made of chitin which has numerous applications. Insect-derived chitin/chitosan is not currently covered under either the feed materials catalogue³⁶, or the feed additives register³⁷.

Frass

Frass is a mixture of insect manure, exoskeletons from moulting processes, and residuals from the processed substrate. Because the insects are considered farmed animals, the frass is considered as a manure and would therefore be classed as an animal by-product. Assuming the material meets regulatory standards³⁸, frass can be used as a soil conditioner and is currently sold for this purpose. But if you want to sell manure, guano or digestive tract content as fertiliser in the EU, they must first be treated at an APHA-approved plant, which uses a standardised and validated methodology to control hazards before the materials³⁹ can be marketed within the EU. The PAS100 specifications for composted materials⁴⁰ should also be consulted.

Similarly, approval from APHA will likely be required if the intention is to supply the composted materials to second parties, or it is intended to use the compost in a place other than on-site.

Conclusion

Global demand for livestock products is expected to more than double by 2050. Livestock production already accounts for around 18 per cent of global carbon emissions and 70 per cent of all agricultural land use worldwide, including crops grown for animal feed. Meanwhile, competition for resources (land, water and fertilisers) between animal feed production, human food and fuel production increasingly contributes to rising pressure on the environment (for example; water supply, deforestation or soil decline in producing countries, overfishing). Farming insects in Scotland represents a sustainable solution which promises to provide a reliable alternative source of protein to help feed people and existing livestock. There is a valuable opportunity for industry, entrepreneurs, consumers, policymakers and regulators to secure the environmental and economic benefits which could be gained.

This document was written to help support and highlight the role which insect farming could play in combating the climate crisis.

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33 Provisions on Processed Animal Proteins (EU) 2017/893 34 Animal by-products and derived products not intended for human consumption (EC) 1069/2009 Art 11.
35 Catalogue of Feed Materials (EU) 2017/1017 36 Catalogue of Feed Materials (EU) 2017/1017 37 On Additives for use in Animal Nutrition (EC) 1831/2003
38 On fertilisers Reg (EC) No 2003/2003 39 APHA Composting Animal by-products Guidance 40 PAS100 Guidelines

Other regulations to consider

[\(EU\) 2018/848](#) on organic production and labelling of organic products

[2008/98/EC](#) on management of waste and end of waste status

[\(EC\) No 834/2007](#) on organic production of fertilisers

[The Animal Feed \(Scotland\) Regulations 2010](#)

[The Feed Hygiene and Enforcement Scotland Regulations 2005](#)

[The Feed \(Sampling and Analysis and Specified Undesirable Substances\) \(Scotland\) Regulations 2010](#)

[Animal By-Products \(Enforcement\) \(Scotland\) Regulations 2013](#)

[The Transmissible Spongiform Encephalopathy \(Scotland\) Regulations 2010 \(as amended\)](#)



