

Discussion paper: Regulatory frameworks influencing insects as food and feed

NB: This is a preliminary draft of a non-exhaustive list of regulations governing insects as food and feed and has not undergone a formal editing process.



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Please send any comments, suggestions, corrections or proposed additions on relevant regulation(s) or from countries not yet covered in this draft to: paul.vantomme@fao.org. Your contribution will be acknowledged.

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1. Introduction

The growing world population coupled with a fast increasing demand for food is placing immense pressure on regional, national and global food systems. In order to feed the world the diversification of food sources, especially protein, for human and animal consumption is paramount. In developing countries alone meat consumption is growing at a rate of 5 percent per year (FAO, 2006). In order to meet this demand insects have been identified as a suitable candidate to supplement other animal-based proteins (FAO, 2013), in addition to new/existing plant-based protein sources. While some countries have encouraged research into edible insects as food and feed as a livelihood activity, as well as nutritious food source, legislation governing this activity still lags significantly behind. Moreover, few regulatory frameworks that explicitly refer to insects as food or feed. There is a considerable amount of ambiguity in the language of laws, regulations and decrees which govern quality, labeling or processing in the food and feed chains.

1.1 Purpose of the study

A major barrier to the growth of the edible insect sector, particularly in developed countries, is the lack of precise and insect-inclusive legislation, standards, labeling and other regulatory instruments (legally binding or otherwise) governing the production, use and trade of insects in the food and feed chains.

This discussion paper aims to:

- Increase awareness of the regulatory barriers to the establishment of an edible insect sector;
- Collate and collect international, regional and local legislation, standards and other regulatory instruments;
- Advise a way forward.

The purpose of this document is to identify and compile relevant legislation, and attempt to give an annotated overview of the current regulations at global, national and regional levels. Moreover, this discussion paper aims to shed light on the current legal climate that influences insects as feed and food, and may provide guidance to stakeholders involved in the development and/or improvement of legislation.

This discussion paper is a follow up to [Chapter 14: Regulatory frameworks governing the use insects for food security](#) in “Edible insects: future prospects of food and feed security,” which was launched on May 13th, 2013 at the International Conference for Forests for Food Security and Nutrition.

Moreover, the [summary of the International Conference on Forests for Food Security and Nutrition](#) states that “governments, civil society, indigenous peoples, bilateral and multilateral

development assistance agencies, the private sector and other stakeholders are invited to strengthen the contributions of forests and trees outside forests to food security and nutrition by: Encouraging research that supports the sustainable use of wild forest

species of plants, as well as insects and other animals, to improve yields and increase the sustainability of food production.”

During the Technical Consultation Meeting “Assessing the Potential of Insects as Food and Feed in assuring Food Security” on 23-25 January 2012 at FAO Headquarters in Rome, Italy, [key action points](#) for the private sector included:

Creating an international industry association with secured funding, developing a position paper to influence policy development, writing a roadmap for the insect protein technology and industry, liaising with regulators, policy makers, scientists and NGOs, and developing quality standards for products (e.g. through self-regulation and certification).

Moreover the strategy and proposed actions for the public sector focused on:

[Inter-] national networking for information exchange, supporting research, and improving awareness and collaboration among relevant ministries (health, agriculture, environment, education and research according to country context).

2. Overview of regulatory frameworks

2.1 Parameters

Regulatory frameworks referred to in this report include legislation, standards and other regulatory instruments (legally binding, voluntary or otherwise), at both the national and international levels that have a role in regulating the use of insects as food and feed. Regulatory frameworks insects in terms of biodiversity conservation are also discussed to a limited degree in this report.

This study looks at the following regulatory frameworks:

- Legally binding agreements
- Voluntary agreements
- Private standards

2.2 Stakeholders

Regulatory frameworks governing insects as food and feed are influenced by a variety of stakeholders. Such actors represent international agencies, and national and regional governments. This includes health inspection agencies, food safety agencies, agriculture and livestock ministries, environmental ministries, and consumer protection agencies.

However, in many countries there is notable ambiguity around which governmental body should be responsible for insects for food and feed. Due to the multidisciplinary nature of using insects for food and feed, especially in the context of edible insects, there are numerous agencies that could hold the jurisdiction over edible insects. Because of the latter point, as well as the fact that insects as food and feed have only recently been flagged as an issue requiring formalized regulations, the issue of edible insects has fallen between the cracks in many cases and has been largely ignored.

In the cases where regulatory frameworks are found, insects often fall under the jurisdiction of pest management departments or food safety agencies. According to these agencies insects are considered a pest rather than a resource, as they are primarily seen as a major cause of damage to crops and contamination of food.

2.3 Precautionary Principle

In countries where entomophagy is not a part of local food culture or culinary tradition, as well as in those countries where insects have been consumed through informal value chains, the food safety of novel food sources like insects are relatively unknown (Spiegel et al, 2013). Potential safety hazards of insects as food and feed are highly contextual and often species dependent. These hazards include a variety of contaminants that can potentially affect an insect over its lifecycle. These include (Spiegel et al, 2013):

- heavy metals
- mycotoxins
- pesticide residues
- pathogens
- natural toxins
- allergens
- processing contaminants
- veterinary residues

Because so little is known about the food safety of insects, legislation in Western countries is relatively conservative when it comes to insects as a replacer for animal-derived proteins (Belluco et al, 2013). As such, the precautionary principle is often used. According to the European Commission, the precautionary principle, in relation to general food law “is relevant in those circumstances where risk managers have identified that there are reasonable grounds for concern that an unacceptable level of risk to health exists but the supporting information and data may not be sufficiently complete to enable a comprehensive risk assessment to be made. When faced with these specific circumstances, decision makers or risk managers, may take measures or other actions to protect health based on the precautionary principle while seeking more complete scientific and other data. Such measures have to comply with the normal principles of non-discrimination and proportionality and should be considered as provisional until such time that more comprehensive information concerning the risk can be gathered and analyzed (EC, 2013).”

3. Consequences of legislative barriers

3.1 Investment

The production of insects for human consumption, as well as for animal feed, is a rapidly growing sector. Over the past five years insect production facilities have increased significantly, especially in Europe, North America, China, South Africa and

Thailand. However, relative to other sectors in the global feed and food industry insects for food and feed are still niche markets.

According to the co-founder of Tiny Farms, USA Daniel Imrie-Situnayake “there are two major sides to the modern bug business: retail and supply. Right now, retail is really taking off. [Insect] products have gained a load of attention, with distributors knocking down [the] doors [of these retailers]. The bottleneck now is supply. With only a couple of food-grade insect farms, the industry’s total production capacity is relatively small. At this moment, any entrepreneur with the resources to start a cricket farm has a guaranteed market for their produce.” (Imrie-Situnayake, 2013).

In many cases, new start-ups are experiencing difficulty in finding investors. From the perspective of the private sector, regulatory barriers are being tackled by finding loopholes in the legislation. Due to the unclear nature of regulations influencing insects as feed and food many producers are faced with the challenge of finding investors who are willing to invest in an emerging and relatively unregulated sector. Consequentially, research and business development is restricted due to a lack of funding. This situation does not just affect potential investment in start-ups, but also the whole value chain including manufacturers, distributors and retailers.

While some entrepreneurs find that there is an increasing interest in their product and business philosophy there are only few investors, as well as other stakeholders in the value chain, who are willing to risk their positions and reputations by being affiliated with a product that is not fully authorized.

In an attempt to influence decision making processes, lobby groups such as [La Fédération Française des Producteurs Importateurs et Distributeurs d'Insectes](#) (See Box 1) have emerged over the past few years. Other groups, such as the [Insect Centre](#) in the Netherlands, acts as a network of actors along the value chain to strengthen interaction between producers and processing companies in the edible insect sector, in order to find new clients and markets. Furthermore the Insect Centre aims to link suppliers of (technical appliances) and knowhow to the insect industry and works together with policy makers and interest groups, who are interested in promoting edible insects as a sustainable protein source.

Box 1: La Fédération Française des Producteurs Importateurs et Distributeurs d'Insectes (French Federation of Producers, Importers and Distributors of Insects)

The FFPIDI is a non-profit organization that brings together and involves different actors in French and international markets related to insects. Their mission is to help newcomers to the market. The FFPIDI offers support services to producers, distributors, as well as importers. Membership is comprised mainly of French companies, but is also open to countries outside of France in order to develop international cooperation. The FFPIDI has created an industry standard which issues certificates to members that meet specifications ensuring safety and code of conduct.

3.2 Research

Over the past two years there has been a significant increase in the number of governmentally funded research projects investigating the potential of insects as feed and food. Research projects play an important role in providing evidence based-results for the safety and efficacy of insect products.

Two examples of recently funded research consortiums:

- 1) [PROteINSECT](#) is a 3 year European Commission FP7 funded project coordinated by the Food and Environmental Research Agency (FERA) in the United Kingdom. The consortium is comprised of partners from Europe, Africa and Asia, ranging from feed industry multinationals, research centres and universities, to farmers and experts in policy change and communications. The PROteINSECT consortium brings together expertise from EU, China, Ghana and Mali, together with European, African and Asian insect breeders and feed production companies to optimize systems and set up pilot scale production facilities in the EU and improving quality issues in non-EU countries.
- 2) [GREEINSECT](#) is a consortium of public and private institutions investigating how insects can be utilized as novel and supplementary sources of protein by means of mass production in small- to large-scale industries in Kenya. GREEINSECT is funded for four years by the Danish International Development Agency (DANIDA). The consortium is organized through work packages addressing: 1) technological development, adoption and adaption capabilities of insects for feed and food, and investigation of operational and implementable business models; 2) creation of the foundation for development of institutional frameworks necessary for managing the risk of disease in the reared insects, humans and animals related to mass rearing systems, and international trade and food security standards; 3) modeling and assessing contribution of insect production systems to green economic growth and nutrition security, and exploring economic and political incentives for the development of climate-friendly food and feed sector; 4) capacity building of Kenyan research institutions and dissemination of knowledge gained; and 5) development of a Kenya-based knowledge platform involving public and private sectors.

Each of these projects includes a work package for developing institutional frameworks and policy for insects as feed or as food. In September 2013 PROteINSECT produced a report "[Deliverable 5.1 – Mapping Exercise Report with regard to current legislation and regulation: Europe and Africa & China.](#)" Other initiatives are also planned, including a conference in Kenya in 2015.

Research also helps provide important evidence on the effect of edible insects on human, animal and environmental health. This evidence can, in turn, be used for applicants when making, for example, a novel food claim (food safety and traditional use) or conducting an environmental impact assessment.

3.3 Trade

At present little statistical data is available on the contribution of edible insects to trade. This is partially due to the fact that the international trade of insect as food and feed is relatively insignificant when compared to other commodities. However, cross-border trade occurs between many countries like Cambodia and Thailand, or South Africa and Botswana. Nevertheless, the vast majority of this trade is unregulated and carried out on an informal basis.

Without governmental regulation of commercial production management standards food safety and hygiene are often not monitored. For example, cricket production in Thailand comprises a significant commercial venture and emerging industry. There are approximately 20,000 cricket farmers, and together they earn an annual gross income of USD 3.5 million (Sanewong Na Adutya, 2011); however, it is not officially recognized in the political arena by governmental agencies. As a result, farmers are often left to solve their own trade and marketing issues.

4. International, regional and national regulatory frameworks

4.1 International

4.1.1 Codex Alimentarius

The Codex Alimentarius is a collection of international food standards, guidelines and codes of practice whose main purpose is to protect the health of consumers and ensure fair practices in food trade. The Codex Alimentarius serves as the basis of many national food standards and regulations. Although the recommendations made by Codex are voluntary for member countries, the standards created under Codex can serve as a basis for national legislation.

So far there has been relatively little international dialogue regarding the incorporation of edible insects into international standards like the Codex. The only example of this kind is the proposal by Laos PDR for a regional standard for edible crickets (Box 2). Having a regional standard would help protect consumer health and ensure the high quality of novel insect products in regional and international food trade.

Box 2: Laos PDR ‘Proposal for new work on development of regional standard for edible crickets and their products’

During the 17th FAO/WHO Codex Alimentarius Coordinating Committee for Asia (CCASIA) the Lao PDR delegation submitted a project document proposing to develop a regional Codex food standard for edible crickets and products made from crickets. This standard would contribute to protect consumer’s health and ensure fair practices in the international trade of these edible insect products from Lao PDR and other producer countries.

The Committee considered the ‘Proposal for new work on development of regional standard for edible crickets and their products’ prepared by Lao PDR delegation with technical assistance from the Food and Agriculture Organization of the United Nations (FAO) in Laos.

FAO has been working together with the Ministry of Health to prepare this new standard proposal for the Codex Committee in the framework of the FAO project Sustainable insect farming and harvesting for better nutrition, improved food security, and household income generation.

Several countries, among them, Cambodia, Thailand and Malaysia, supported the proposal made by Lao PDR, and declared they were in favor of the development of a regional standard for edible crickets. The proposal led to a general discussion about trade and consumption of edible insects in Asia region.

The Committee noted that insects are consumed in many countries and that there is a great potential and growing global interest for the utilization of insects as food resource and generally supported the proposal. The Chairman concluded by saying that there was an interest in this standard and that it will be discussed more in details at the next session of the CCASIA, after Lao PDR has provided clarifications and data on national and international trade.

The Committee agreed with the Lao PDR delegation proposal to lead an electronic working group to compile the data from other countries. Lao PDR requested for the support of FAO in compiling the requested additional information and eventually for drafting the proposed standard.

(Source: FAO, 2010)

Despite the historical prevalence of insect consumption in Asia, insects were not included in the Codex Alimentarius as they reported that the food safety aspect of edible insects had not been studied to an extent where confidence could be achieved. On the other hand, the Codex Alimentarius Commission (CAC) did note that adopting a standard may help in increasing the quality of insect-based products available, and consequently the level of in food safety achieved in Asia (CAC, 2010).

Under the Codex Alimentarius insects would be comparable to other types of foods of animal origin. Therefore, the following standards may apply either fully or partially (CAC, 2010):

Standard	Objectives
General Principles of Food Hygiene CAC/RCP 1-1969	<ul style="list-style-type: none"> • identify the essential principles of food hygiene applicable throughout the food chain (including primary production through to the final consumer), to achieve the goal of ensuring that food is safe and suitable for human consumption; • recommend a HACCP-based approach as a means to enhance food safety; • indicate how to implement those principles; and • provide a guidance for specific codes which may be needed for - sectors of the food chain; processes; or commodities; to amplify the hygiene requirements specific to those areas.
Hygienic Practices for Meat (CAC/RCP 58-2005)	<ul style="list-style-type: none"> • covers hygiene provisions for raw meat, meat preparations and manufactured meat from the time of live animal production up to the point of retail sale. • develops 'The Recommended International Code of Practice: General Principles of Food Hygiene' in respect of these products.
CAC/RCP 54-2004 – The Codex code of practice on good animal feeding	<ul style="list-style-type: none"> • ensures the safety of food for human consumption through adherence to good animal feeding practice at the farm level and good manufacturing practices (GMPs) during the procurement, handling, storage, processing and distribution of animal feed and feed ingredients for food producing animals.

4.1.2. Hazard Analysis and Critical Control Points (HACCP)

The [HACCP system](#) is science-based and systematic. It identifies specific hazards and measures for their control to ensure the safety of food. HACCP is a tool to assess hazards and establish control systems that focus on prevention rather than relying mainly on end-product testing. Any HACCP system is capable of accommodating change, such as advances in equipment design, processing procedures or technological developments.

HACCP can be applied throughout the food chain from primary production to final consumption and its implementation should be guided by scientific evidence of risks to

human health. As well as enhancing food safety, implementation of HACCP can provide other significant benefits. In addition, the application of HACCP systems can aid inspection by regulatory authorities and promote international trade by increasing confidence in food safety.

4.2. Regional - European Union

4.2.1. Key Administrative bodies

The [European Food Safety Authority](#) (EFSA) is an independent authority administering risk assessments regarding food and feed safety. The EFSA works closely with member countries to give advice on existing and emerging risks. The EFSA was established in 2002 by the [EC General Food Regulation 178/2002](#) which laid down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety. The EFSA was established after a series of detrimental food crises, like BSE, occurred during the 1990s (EFSA, 2013).

The [European Commission Director General for Health and Consumers](#) (DG Sanco) monitors the implementation of EU Regulations at national, regional and local governmental levels, and ensure that members of the private sector (traders, manufacturers and food producers) are obeying the regulations. Additionally when possible the DG Sanco can make proposals for EU action.

[The Scientific Committee on Food](#) is responsible for developing recommendations concerning safety aspects of:

- 1) Information necessary to support an application for placing novel food and ingredients on the market;
- 2) The presentation of such information
- 3) The preparation of the initial assessment reports.

4.2.2.1. Feed: Relevant legislation

The regulations listed here are of high relevance to edible insect feed products placed on the European market. The list is not exhaustive.

	Regulation	Full name of regulation	Purpose	Notes
1	1069/2009	EC Regulation 1069/2009 laying down health rules as regards animal by-products and derived products not intended for human consumption and repealing Regulation (EC) No 1774/2002 (Animal by-products Regulation)	<ul style="list-style-type: none"> Establishes strict health rules for the use of animal by-products, so as to ensure a high level of health and safety. In particular it inhibits intra-species recycling; Sets out the measures to be implemented for the processing of animal by-products; Establishes a classification of animal by-product materials (Categories 1, 2 & 3) 	<ul style="list-style-type: none"> Under EC Regulation 1069/2009: <ol style="list-style-type: none"> 'animal' means any invertebrate or vertebrate animal; 'farmed animal' means (a) any animal that is kept, fattened or bred by humans and used for the production of food, wool, fur, feathers, hides and skins or any other product obtained from animals or for other farming purposes; (b) equidae; Insects used as feed would be considered under Category 3. Category 3 material comprises the following animal by-products, including (for a full description please refer to the summary of EC Regulation 1774/2002) Includes a ban on the use of manure and catering waste for feeding of farm animals, including insects
2	32/2002	DIRECTIVE	<ul style="list-style-type: none"> The Directive lays down a 	

		2002/32/EC of the European Parliament and the Council of 7 May 2002 on undesirable substances in animal feed	list of undesirable substances, for which it sets limit values above which their presence in animal feeds is forbidden (see Annex I to the Directive). This list is regularly updated in the light of technical progress.	
3	68/2013	EC Regulation 68/2013 on the Catalogue of feed materials	<ul style="list-style-type: none"> • To support livestock farmers who normally do not analyze the feed materials they use • Facilitates the implementation of EC Regulation 767/2009 	<ul style="list-style-type: none"> • Voluntary, materials not listed does not imply that they are barred from use. Feed materials used, but not listed must be registered under the Feed Materials Register.
4	142/2011	EC Regulation 142/2011 implementing Regulation (EC) No 1069/2009 of the European Parliament and of the Council laying down health rules as regards animal by-products and derived products not intended for human consumption and implementing Council Directive 97/78/EC as regards certain	<ul style="list-style-type: none"> • To simplify the procedure of labeling and marketing feed, while guaranteeing a high level of protection for animal health and welfare, as well as public health • This Regulation covers feed, i.e. any substance or product, including additives, whether processed, partially processed or unprocessed, intended to be used for oral feeding to animals. 	<ul style="list-style-type: none"> • Includes Processed Animal Proteins: (PAP) animal protein derived entirely from Category 3 material, which have been treated in accordance with Section 1 of Chapter II of Annex X so as to render them suitable for direct use as feed material or for any other use in feedingstuffs. Only animal by-products which are Category 3 material or products which are derived from such animal by-products, other than the Category 3 materials referred to in Article 10(n), (o) and (p) of Regulation (EC) No 1069/2009, may be used

		samples and items exempt from veterinary checks at the border under that Directive		<p>for the production of processed animal protein.</p> <ul style="list-style-type: none"> • If insects are considered a Category 3 materials shall comprise the following animal by-products: (a) carcasses and parts of animals slaughtered;
5	767/2009	EC Regulation 767/2009 on the placing on the market and use of feed, amending European Parliament and Council Regulation (EC) No 1831/2003 and repealing Council Directive 79/373/EEC, Commission Directive 80/511/EEC, Council Directives 82/471/EEC, 83/228/EEC, 93/74/EEC, 93/113/EC and 96/25/EC and Commission Decision 2004/217/EC	<ul style="list-style-type: none"> • Helps to provide information to users concerning the content of the feed purchased for livestock and other animals 	<ul style="list-style-type: none"> • Implemented through EC Regulation 68/2013
6	183/2005	EC Regulation 183/2005 laying down requirements for feed hygiene	<ul style="list-style-type: none"> • Establishes general rules governing feed hygiene, conditions and arrangements ensuring traceability of feed as well as conditions and 	

			arrangements for registrations and approval of establishments	
7	999/2001 & 56/2013	<p>EC Regulation 999/2001 laying down rules for the prevention, control and eradication of certain transmissible spongiform encephalopathies</p> <p>EC Regulation 56/2013 amending Annexes I and IV to Regulation (EC) No 999/2001 of the European Parliament and of the Council laying down rules for the prevention, control and eradication of certain transmissible spongiform encephalopathies</p>	<ul style="list-style-type: none"> Establishes rules for the prevention, control and eradication of certain transmissible spongiform encephalopathies in animals in order to protect human and animal health. 	<ul style="list-style-type: none"> Created after the BSE outbreak of 1994. Under EC Regulation 56/2013 processed animal proteins (PAPs) from non-ruminant animals and feedingstuffs containing such PAP have now been reauthorized for feeding aquaculture species. However, this does not include insects. (see 4.4 for further discussion).

Definitions

- a) According to [EU Regulation 142/2011](#) ‘**processed animal protein**’ means animal protein derived entirely from Category 3 material, which have been treated in accordance with Section 1 of Chapter II of Annex X (including blood meal and fishmeal) so as to render them suitable for direct use as feed material or for any other use in

feedingstuffs, including petfood, or for use in organic fertilisers or soil improvers; however, it does not include blood products, milk, milk-based products, milk-derived products, colostrum, colostrum products, centrifuge or separator sludge, gelatine, hydrolysed proteins and dicalcium phosphate, eggs and egg-products, including eggshells, tricalcium phosphate and collagen;

b) According to [EC Regulation No 1774/2002](#) **Category 3 feed material** comprises of the following animal by-products:

- parts of slaughtered animals which are fit for human consumption but are not intended for human consumption for commercial reasons;
- parts of slaughtered animals which are rejected as unfit for human consumption but are not affected by any sign of a communicable disease;
- hides and skins, hooves and horns, pig bristles and feathers originating from animals that are slaughtered in a slaughterhouse and were declared fit for human consumption after undergoing an ante mortem inspection;
- blood obtained from animals declared fit for human consumption after undergoing an ante mortem inspection, other than ruminants slaughtered in a slaughterhouse;
- animal by-products derived from the production of products intended for human consumption, including degreased bones and greaves;
- former foodstuffs of animal origin, other than catering waste, which are no longer intended for human consumption for commercial reasons or due to problems of manufacturing or packaging defects;
- raw milk originating from animals that do not show any signs of a communicable disease;
- fish or other sea animals, except sea mammals, caught in the open sea for the purpose of fishmeal production, and fresh by-products from fish from plants manufacturing fish products for human consumption;
- shells of eggs originating from animals that do not show any signs of a communicable disease;
- blood, hides and skins, hooves, feathers, wool, horns, hair and fur originating from healthy animals;
- catering waste other than category 1.

4.2.3. Food: Relevant legislation

The regulations listed here are of high relevance to edible insect products placed on the European market. The list is not exhaustive.

	Regulation	Full name of regulation	Purpose	Relevant amending acts and repeals	Notes
1	133/2008	EC Regulation 1333/2008 on food additives	<ul style="list-style-type: none"> • Aims to harmonize the use of food additives in foods, or in other additives or food enzymes, at Community level; • Simplifies the approval procedure for food additives and is an opportunity for the Commission to update and supplement the European food additives list. 		<ul style="list-style-type: none"> • Under directive EC Directive 94/36/EC on colours for use in foodstuffs (excluding bee products) the only insect-derived food additive considered is E 120 (cochineal, Carminic acid, Carmines)
2	854/2004	EC Regulation 854/2004 laying down specific rules for the organisation of official controls on products of animal origin intended for human consumption	<ul style="list-style-type: none"> • Establishes controls on products of animal origin intended for human consumption and laying down specific rules for fresh meat, bivalve molluscs, milk and dairy products 		<ul style="list-style-type: none"> • Official veterinarian audits: hygiene (maintenance of plant structure and equipment, plant hygiene, staff hygiene, training, etc.) and procedures based on the HACCP (Hazard Analysis and Critical Control Point) system
3	853/2004	EC Regulation 853/2004 laying down specific hygiene rules for food of animal origin	<ul style="list-style-type: none"> • Ensures a high level of food safety and public health through establishing hygiene rules for food of animal origin that may present 		<ul style="list-style-type: none"> • Accompanies 854/2004 and 852/2004 in the “hygiene package”

			microbiological and chemical hazards, necessitating the adoption of specific hygiene rules contributing to the completion of the internal market and ensuring a high level of public health protection	
4	852/2004	EC Regulation 852/2004 on the hygiene of foodstuffs	<ul style="list-style-type: none"> Ensures the hygiene of foodstuffs at all stages of the production process, from primary production up to and including sale to the final consumer 	<ul style="list-style-type: none"> Accompanies 854/2004 and 853/2004 in the “hygiene package”
5	258/1997	EC Regulation 258/1997 concerning novel foods and novel food ingredients	<ul style="list-style-type: none"> Harmonizes novel food and novel ingredients before they are placed on the market, tests carried out by the European Food Safety Authority must demonstrate that these products do not pose any risk to health or the environment. Provides a risk assessment before the marketing of novel foods and ingredients 	<p>COM(2007) 872 Proposal for a regulation of the European Parliament and of the Council on on novel foods and amending Regulation (EC) No XXX/XXXX</p> <ul style="list-style-type: none"> To market novel foods or ingredients, companies must apply to a EU country authority for authorization, presenting the scientific information and safety assessment report The Standing Committee on Food Chain and Animal Health also gives opinion on applications COM(2007) 872 suggests a new definition of novel food (See 4.2.3).

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DRAFT

Novel Definitions:

Novel foods and novel food ingredients are foods and food ingredients that have not been used for human consumption to a significant degree in the EU before 15 May 1997. They must be:

- i) Safe for consumers;
- ii) Properly labelled to not mislead consumers.

The new Novel Food Regulation COM(2007) 872 is available in draft form and proposes the new definition of novel food as (EC, 2008: p. 1):

- i. food that has not been used for human consumption to a significant degree within the Community before 15 May 1997;
- ii. food of plant or animal origin when to the plant and animal is applied a non-traditional breeding technique not used before 15 May 1997; and
- iii. food to which is applied a new production process, not used before 15 May 1997, where that production process gives rise to significant changes in the composition or structure of the food which affect its nutritional value, metabolism or level of undesirable substances.

“Whenever changes are made to the way in which food is put on the market, produced or processed or uses non-traditional ingredients, the implications for consumer safety and nutritional value will require consideration”

Source: [EC Recommendation 97/618](#)

Moreover, according to the new Regulation “‘traditional food from a third country’ means novel food with a history of food use in a third country, meaning that the food in question has been and continues to be part of the normal diet for at least one generation in a large part of the population of the country” (EC, 2008: p.16).

Due to the widespread history of entomophagy in many countries outside Europe insect-based foodstuffs would most likely be considered as “traditional food from a third country” (Belluco, 2013). Accompanying this, “history of safe food use” will need to be demonstrated showing “that the safety of the food in question is confirmed with compositional data and from experience of use and continued use in the normal diet of a large part of the population of a country” (EC, 2008: p. 16). If this cannot be demonstrated a complete risk assessment will need to be performed (Belluco, 2013).

However, novel foods are not classified as novel until a member state declares it novel; therefore, in accordance to the [EC Recommendation 97/618](#) concerning the scientific aspects and the presentation of information necessary to support applications for the placing on the market of novel foods and novel food ingredients and the preparation of initial assessment reports under EC regulation 258/1997 a dossier must be submitted

by a person to the member country where the product will be marketed for the first time. The following information should be submitted regarding an insect based-product submitted within a dossier:

- Specification of the novel food
- Effect of the production process applied
- History of the organism used as the source of the novel food
- Anticipated intake/extent of the use
- Information from previous human exposure to the novel food or its source
- Nutritional information
- Microbiological information
- Toxicological information

Box 3: Casu marzu and Milbenkäse

For centuries *casu marzu*, a cheese produced from pecorino cheese, has been consumed throughout Sardinia. The traditional cheese making process includes the infestation of the cheese by the maggots of the cheese fly (*Piophilidae casei*) (Slow Food, 2013).

Milbenkäse, a cheese produced from the dried skimmed curd of goats, sheep or cow's, has been consumed in Central Germany milk for over 300 years (Slow Food, 2006).

Despite these long standing cheese making traditions both *Casu marzu* & *Milbenkäse* fall into a legal grey area; under the [EU Regulation 178/2002](#) foodstuffs containing live animals are permitted only if they are "prepared for placing on the market for human consumption". However in the case of *Milbenkäse*, cheese mites or their digestive juices are not explicitly permitted as additives for cheese according to the relevant German food ordinances (Zusatzstoff-Zulassungsverordnung and Käseverordnung). *Milbenkäse* is produced under a permit by the local food safety office and HACCP compliance of the product is enforced (Milbenkaese.de, 2013).

Attempts have been made to declare *casu marzu* as a traditional food under European standards. As per [EU Regulation 509/2006](#) 'traditional' means proven usage within the EU for a time period showing transmission between generations (generally ascribed to one human generation, at least 25 years). An [official document](#) by the Regional Government of Sardinia has been produced explaining the traditional method of making *casu marzu* (Regione Autonoma della Sardegna, 2013). However, as of December 2013 *casu marzu* is not recognized in the [EU Database of Origin and Registration](#).

4.2.4. Discussion:

Belco et al (2013) have identified several points where clarity in EU legislation on food and feed is needed:

1. Are insects and insect derived products indeed novel foods?

2. Which feed/substrate can be used for insects?
3. Can food products consisting of/derived from insects be considered “production of animal origin”?
4. Can insect protein be used in the feed of food producing pigs and poultry?

Within all of the above listed regulations specific reference to insects only addresses feed hygiene; no explicit reference to insects is made, most importantly under EC Regulation 1774/2002. There are two main ways in which this could be addressed:

1. through the specific reference insects into “farmed animal” under EC Regulation 1069/2009 (Article 3, 6a);

or
2. through the creation of a EC Regulation governing insects as feed.

Insects are not mentioned within the EC Regulation 258/1997 concerning novel food and novel food ingredients. One means of recognizing insects as a novel food would be to file a dossier for each individual insect species which advises its safety.

Existing EU legislation does not prevent the feeding of farmed animals with live insects. However, insect PAP is not allowed to be fed to farmed animals due to the feed ban restrictions (Plantady, M. pers.comm., 13 December, 2013).

In June 2013, a new EC Regulation 56/2013 came into effect reforming the rules on processed animal proteins (PAPs) used as feed. PAPs from non-ruminant animals and feedstuffs containing such PAP have now been reauthorized for feeding aquaculture species. These PAPs should still adhere to strict requirements during the collection, transport and processing of those products should apply in order to avoid any risk of cross-contamination with ruminant protein. Under EC Regulation 56/2013 Category 3 PAPs would only be permitted as feed for aquaculture species (Plantady, M., pers. comm., 6 December, 2013).

Currently substrates of 100% vegetable origin and animal by-products (ABP) belonging to the category 3 (i.e. ABP derived from parts of animals which have been declared fit for human consumption) may be used for feeding insects. The use of other substrates would require modification of the EU legislation on ABP. Such considerations are part of the above mentioned internal SANCO discussions (Plantady, M. pers.comm., 13 December, 2013).

Insects are not included in EC Regulation 56/2013, mainly due to the fact that the whole procedure with processing in slaughterhouses is not applicable for them. However due to the increased interest in the topic a modification of the annex is in the drafting process, to include insects under EC Reg. 999/2001, but not yet adopted.

At this stage it is unsure what kind of specification will be put into place for the methods of killing insects (Plantady, M., pers. comm., 6 December, 2013).

The EU legislation has recently been modified to authorise the feeding of aquaculture animals with non-ruminant PAP (mainly poultry and pig PAP). Authorising the feeding of poultry with non-ruminant PAP is being considered but still requires the validation of a laboratory method allowing the detection of poultry PAP in feed, in order to control the absence of cross-contamination (cannibalism). Such method is not validated at this stage. You may find further information in point 2.2 of the Commission Communication "[TSE Roadmap 2](#)" (Plantady, M. pers.comm., 13 December, 2013).

In terms of poultry feed the DG Sanco is analysing which steps are necessary in order to produce and allow insect processed animal protein (PAP) to be fed to non-ruminant farmed animals. Internal discussions within DG SANCO are ongoing to determine the steps needed (Plantady, M. pers.comm., 13 December, 2013).

5. Canada

5.1 Relevant administrative bodies

(This section was provided by André Jean, Scientific Evaluator, Health Canada)

Canada has three levels of bureaucracy. In principle, the federal government deals with laws on food pertaining to import/export, novel foods, as well as interprovincial transport of food. The provincial levels deal with farming and food processing regulation. The municipal level mainly enforces the provincial laws but also has a few bylaws pertaining to public health and usually to do with the sorts of enterprises that one finds in cities and towns (like restaurants, markets, grocery stores and etc.).

[Health Canada](#) is the key administrative body in Canada that would be responsible regulations governing for insects as food and feed. The [Canadian Food Inspection Agency](#) (CFIA) falls under Health Canada and handles issues related to food safety and public health.

The CFIA conducts novel food safety assessments under the [Food Directorate](#). The purpose of the directorate is to establish policies, set standards and provide advice and information on the safety and nutritional value of food.

Provincial health authorities may rely on Health Canada when they are seeking an opinion on emerging issues related to food safety. In the development of guidance documents or regulations, their participation and/or their opinion submitted through consultations are solicited by Health Canada. However, when the provincial authorities establish their own guideline documents or their own regulations, they may be more stringent than what has been established by the federal government. When it comes to insects as food and feed, provincial authorities do have the power to control, limit or ban their use on their own territory.

5.1.1 Food

In the mid 90's Health Canada had developed a policy as a compliance guideline on the use of a single insect larva (Gusano roja; family Cossidae or Megathymidae) marketed in a traditional Mexican alcoholic beverages such as mescal and, in some cases, tequila. The field origin insect is not associated with filth or unsanitary conditions. The sale of this product in Canada was approved with the following provisions:

- Product is marketed for an adult clientele
- Insect ingredient is clearly and properly identified on the label
- Specific insect larvae of the Order Lepidoptera are used
- Larvae is harvested in the same hygienic conditions as the manufacturing of the product
- Product complies with the requirements of provincial and territorial liquor boards

There has been a need to determine if insects used as food were considered to be "Novel Food" as defined in Division 28 of the Canadian Food and Drug Regulations. According to section B.28.001 of the Canadian Food and Drug Regulations, "novel food" means:

(a) a substance, including a microorganism, that does not have a history of safe use as a food;

(b) a food that has been manufactured, prepared, preserved or packaged by a process that

(i) has not been previously applied to that food, and

(ii) causes the food to undergo a major change; and

(c) a food that is derived from a plant, animal or microorganism that has been genetically modified such that

(i) the plant, animal or microorganism exhibits characteristics that were not previously observed in that plant, animal or microorganism,

(ii) the plant, animal or microorganism no longer exhibits characteristics that were previously observed in that plant, animal or microorganism, or

(iii) one or more characteristics of the plant, animal or microorganism no longer fall within the anticipated range for that plant, animal or microorganism. (aliment nouveau)

Most of the popular insects used as food around the world do have a history of safe use for human consumption as it is estimated that over a 1,000 species of insects are consumed in 80% of the world's nations. Those insects would not meet the definition of novel food as described above.

Insects that do not have a history of safe use as a food may be considered as novel food and as such, they may need an assessment from the Novel Food Section of the Bureau of Microbial Hazards, Food Directorate, Health Canada. Insects that are not considered as "novel food" may be offered for sale to Canadian consumers as long as they are not in violation of the Food and Drugs Act and Regulations; namely Sections 4, 5 and 7 of the Act and Division 28 of the Regulations. [Division 28 of the Food and Drug Regulations](#) applies to Novel Food, their assessment and their pre-market notification.

[Section 4 of the Food and Drugs Act](#) states that:

No person shall sell an article of food that:

- (a) has in or on it any poisonous or harmful substance;
- (b) is unfit for human consumption;
- (c) consists in whole or in part of any filthy, putrid, disgusting, rotten, decomposed or diseased animal or vegetable substance;
- (d) is adulterated; or
- (e) was manufactured, prepared, preserved, packaged or stored under unsanitary conditions.

Marginal note: Exemption

(2) A food does not have a poisonous or harmful substance in or on it for the purposes of paragraph (1)(a) — or is not adulterated for the purposes of paragraph (1)(d) — by reason only that it has in or on it a pest control product as defined in subsection 2(1) of the [Pest Control Products Act](#), or any of its components or derivatives, if the amount of the pest control product or the components or derivatives in or on the food being sold does not exceed the maximum residue limit specified under section 9 or 10 of that Act.

[Section 5 of the Food and Drugs Act](#) states that :

(1) No person shall label, package, treat, process, sell or advertise any food in a manner that is false, misleading or deceptive or is likely to create an erroneous impression regarding its character, value, quantity, composition, merit or safety.

Marginal note: Food labelled or packaged in contravention of regulations

(2) An article of food that is not labelled or packaged as required by, or is labelled or packaged contrary to, the regulations shall be deemed to be labelled or packaged contrary to subsection (1).

[Section 7 of the Food and Drugs Act](#) states that:

No person shall manufacture, prepare, preserve, package or store for sale any food under unsanitary conditions.

Furthermore, importers of live insects for reproduction and processing will have to meet the requirements of Agriculture and Agri-Food Canada by obtaining a permit and meet the requirements of Environment Canada for importation of live insects and endangered species. Establishments that would process insects should operate under good manufacturing practices and have a sampling program in place to proceed with microbiological analysis such as Aerobic colony counts (ACC), E. coli, Salmonella spp, Staphylococcus aureus and its toxins, Bacillus cereus, pH and water activity (Aw). During processing, a cooking step should be recommended and potential for cross-contamination between ready-to-eat food and raw food should be addressed. Manufacturers/importers of insects for human consumption would need to contact their local office of the Canadian Food Inspection Agency to inquire about their licensing and compliance requirements.

In Canada, manufacturers and importers are responsible to ensure that the foods they are processing and/or importing meet the requirements of the Food and Drugs Act and Regulations, namely sections 4, 5 and 7; all other jurisdiction requirements and that the foods are safe, wholesome and nutritious. Along with consumers, they will need to be aware that insect proteins could be the cause of unforeseeable allergic reactions.

5.2.1 Restaurants

Restaurants may be allowed to sell dishes containing insects pertaining the insects used in the dishes meet the requirements mentioned above. However, municipal or provincial health authorities may have provisions in their own regulations that would condition, limit or prohibit the sale of dishes containing insects.

Box 4: Vij's restaurant, Vancouver, Canada

In 2009 Vij's, a popular Indian restaurant in Vancouver, British Columbia, began using insects as an ingredient in one of their new dishes after consulting the author of *The Eat-a-Bug Cookbook*, David George Gordon. The live crickets used in their recipe would be frozen, defrosted and rinsed, then seasoned with Indian spices and roasted in a 350-degree oven. The seasoned, roasted crickets would be allowed to cool before they were ground into a powder using a food processor. Then they'd be blended with chapatti flour and baked to make a form of parantha — a traditional Indian flatbread, in this case with an entomophagical twist. The flatbread would be stuffed with a mixture of onion, turnips and other ingredients, cut into bite-sized triangles, and served as an appetizer to Vij's clientele.

"We were filling about two dozen orders in an evening," co-owner Meeru Dhalwala recalls. "Everything was going great, until a reporter—we don't really know who—complained to the Vancouver health department. We had been so focused on the new dish that we neglected to notify them. That was entirely our mistake." To comply with city inspectors, Vij's voluntarily removed its Cricket Parantha from the menu, giving time for Vancouver Coastal Health to conduct tests on the crickets in the dish. "They asked us for a sample of two crickets — one raw and one roasted — for their laboratory tests," Meeru recounts. The tests revealed the presence of bacteria on the dead, uncooked cricket, just as one might expect in a sample of raw chicken or beef. But as experienced with these more conventional forms of protein, the cooked cricket showed no such signs of bacterial life. Clearly, the process of baking destroyed any germs.

"The health authorities were polite and quite extremely open-minded about the whole thing," says Meeru. "They asked us to post instructions, written in Punjabi, in the restaurant's kitchen, telling our crew how to properly handle the crickets to eliminate any chance of cross-contamination." In less than a week, Cricket Parantha was back on the menu at Vij's. It remained there through the July and August 2011, until it and other summer treats were ousted by fall menu choices.

(Adapted from David Gordon:

<http://www.foodinsectsnewsletter.org/pdfs/Vij'sArticlebyDGGordon.pdf>)

5.3.1 Feed

All feed and feed ingredients are regulated by the Canadian Food Inspection Agency. Insects are currently not listed as an acceptable feed ingredient and are considered a novel feed ingredient (Category 3) by CFIA.

An application for [Feed Registration and Ingredient Approval](#) must be submitted for review. Within three months of a product being registered, a final label must be submitted to the Animal Feed Division for approval.

Those companies that have a novel feed ingredient application under review require a demonstration of safety and efficacy for each target animal species. Temporary approval and classification under Category 2 may occur, if during the application process, the product is demonstrated to be safe, but requires further efficacy trials.

 Canadian Food Inspection Agency / Agence canadienne d'inspection des aliments		<div style="border: 1px solid black; padding: 2px; display: inline-block;">Clear / Éffacer</div>	<table border="1" style="width: 100%;"> <tr> <td style="text-align: center;">Reference No. / N° de référence</td> </tr> <tr> <td style="text-align: center;">Date Received / Reçu le</td> </tr> </table>	Reference No. / N° de référence	Date Received / Reçu le
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SCHEDULE III - FORM 1 APPLICATION FOR FEED REGISTRATION OR RENEWAL		ANNEXE III - FORMULE 1 DEMANDE D'ENREGISTREMENT OU DE RENOUVELLEMENT POUR LES ALIMENTS DU BÉTAIL			
<i>Labels must be included</i> <i>Incomplete packages may be returned</i> <i>Leave shaded areas blank</i> <small>In compliance with the <i>Feeds Act</i>, application is hereby made for the registration of the feed noted, the particulars of which are certified to be true and complete.</small>		<i>Prière d'inclure les étiquettes</i> <i>Les dossiers incomplets pourraient être retournés</i> <i>Ne pas écrire dans les espaces ombragés</i> <small>Conformément à la <i>Loi relative aux aliments du bétail</i>, je demande par la présente l'enregistrement de l'aliment sousmentionné et atteste que les détails donnés au sujet de cet aliment sont exacts et complets.</small>			
Company Name and Address / Nom et adresse de la compagnie <div style="background-color: #e0e0e0; height: 60px; width: 100%;"></div>		Application for / Demande pour <input type="checkbox"/> Mixed Feed / Aliment mélangé <input type="checkbox"/> Amendment / Modification <input type="checkbox"/> Renewal / Renouvellement <input type="checkbox"/> Ingredient / Ingrédient <input type="checkbox"/> Research Exemption / Exemption pour fins de recherche			
Tel. No. / N° de tél. Fax. No. / N° de télécopieur		Payment Enclosed (complete Method of payment section, page 2 / back) / Paiement inclus (remplir la portion Mode de paiement , page 2 / verso) <div style="background-color: #e0e0e0; width: 100%; height: 15px;"></div> Canadian Funds Only / En dollars canadiens seulement			
Name and Signature of Authorized Representative / Nom et signature du représentant autorisé <div style="background-color: #e0e0e0; height: 20px; width: 100%;"></div>		Data Enclosed (if required) / Données incluses (si besoin est) <input type="checkbox"/> Yes / Oui			
		Date YYYY - MM - DD / AAAA - MM - JJ <div style="background-color: #e0e0e0; width: 100%; height: 15px;"></div>	Submission Type Code (page 2 / back) / Code de la demande (page 2 / verso) <div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; padding: 2px; width: 20px; text-align: center;">#</div> <div style="border: 1px solid black; padding: 2px; width: 20px; text-align: center;">#</div> </div>		

Figure 2: An example of the Application for Feed Registration or Renewal in Canada (CFIA, 2010)

6. United States

6.1 Relevant administrative bodies

The [Food and Drug Administration of the United States](#) (FDA) is the most important authority governing food safety.

Box 5: The Food Defect Action Levels – Levels of natural or unavoidable defects in food that present no hazards for humans

The United States Food and Drug Administration, like other regulatory bodies in other countries, established the Food Defect Action Levels in light of the fact that it is economically impractical to grow, harvest or process raw products that are totally free of non-hazardous, naturally occurring, unavoidable defects. Products harmful to consumers are subject to regulatory action whether or not they exceed the action levels. These action levels are mainly established for aesthetic purposes and allow for permissible limits of insect fragments, among other things like moulds and mammalian excreta, to enter into processed products (USFDA, 2013).

6.2.1 Food:

Although there is no explicit reference to insects as food insect-based products would fall under the [Federal Food, Drug, and Cosmetic Act](#) (FFDCA). Other than the FDA, no organization currently regulates the industry. Moreover, insect-based products must conform to the standard practices of all other US foods including salmonella and E. coli testing. The attitudes of health departments vary between city to city with some more accepting of insects as food than others.

Edible insects are considered food additives. Therefore, those wishing to use insects in feed and food products must follow [§ 348 Food Additives](#) of the FFDCA. According to §348 (p.109) “Any person may, with respect to any intended use of a food additive, file with the Secretary a petition proposing the issuance of a regulation prescribing the conditions under which the additive may be used safely.” Supplementary information such as samples of the additive are required. Notice of the approval or denial of the petition will be given by the Secretary within thirty days of filing. Existing regulation governing novel foods/food additives in the USA are similar in nature to those of the EU.

All producers of edible insect products must also conform to all FDA manufacturing procedures known as [Good Manufacturing Practice](#) (GMP) under the FFDCA and must be manufactured in regulated facilities. All insect products must be labeled with both the common and scientific name and a Potential Shellfish Allergy warning must be on the packaging for the product.

Box 6: World Ento

[World Ento](#), a Georgia-based company, has developed its own private standards and comprehensive HACCP plan for cricket-based products for reasons of biological, physical and chemical safety. They maintain strict processing regiments which include several water and heat treatments. All World Ento insects must be tested for parasites, pesticides, herbicides, heavy metal residue, microbes, pH and Water Activity (these are all in-house regulations). World Ento also uses a closed cycle production system, which includes recycling the insect waste into fertilizer.

According to World Ento setting a high standard of food safety while the industry is still young is important in ensuring the success of this growing industry; otherwise, a potential major health and public relation disaster may seriously harm public perception of edible insects and cripple the industry.

6.2.2 Feed:

Under the FFDCa any substance that is added to or is expected to become an [ingredient or additive of animal food and feed](#) (directly or indirectly) must be in accordance to [§ 348 Food Additives](#) if it has not been [generally recognized as safe](#) (GRAS) for that use. In order for a food additive to be considered GRAS there needs to be significant third party evidence regarding (USFDA, 2013):

- 1) General recognition of the safety of the ingredient or additive through scientific procedures is based on published scientific studies and corroborated by unpublished studies and other data and information.
- 2) General safety must have a substantial history of consumption for food use by a significant number of consumers.

7. Australia & New Zealand

7.1 Relevant administrative bodies

[Food Standards Australia New Zealand](#) (FSANZ) is an independent statutory agency established by the Food Standards Australia New Zealand Act 1991. FSANZ develops standards that regulate the use of food products and ingredients (such as colouring, additives, vitamins and minerals), as well as labeling requirements and food composition (FSANZ, 2013).

7.2.1 Food

The [Australia New Zealand Food Standards Code - Standard 1.5.1 - Novel Foods](#) regulates the sale of novel food and novel food ingredients. Novel food products are prohibited from sale unless listed otherwise. This regulation is relatively similar to [EU Novel Food legislation](#). In Australia and New Zealand novel food means a non-traditional food and the food requires an assessment of the public health and safety considerations regarding:

- (a) the potential for adverse effects in humans; or
- (b) the composition or structure of the food; or
- (c) the process by which the food has been prepared; or
- (d) the source from which it is derived; or
- (e) patterns and levels of consumption of the food; or
- (f) any other relevant matters.

Whereas non-traditional food means:

- (a) a food that does not have a history of human consumption in Australia or New Zealand; or
- (b) a substance derived from a food, where that substance does not have a history of human consumption in Australia or New Zealand other than as a component of that food; or
- (c) any other substance, where that substance, or the source from which it is derived, does not have a history of human consumption as a food in Australia or New Zealand.

According to the record of views formed by the [Food Standards Australia New Zealand \(FSANZ\) Novel Foods Reference Group/ the Advisory Committee on Novel Foods](#) the following insect species super mealworm (*Zophobas morio*), house crickets (*Achaeta domestica*), and mealworm beetle (*Tenebrio molitor*) are considered non-traditional foods in New Zealand and Australia, but not novel food. This indicates that they would need to comply with the regular [Food Standards Code](#). No safety concerns were identified, but labeling of true nature of food is required.

Note to the readers:

We very much welcome inputs on other countries as to achieve gradually a larger global coverage. What follows is some information regarding Switzerland, the Netherlands, Belgium, UK and on East Africa (Kenya, Uganda) and is intended as an example of some relevant information rather than an exhaustive country review.

8. Switzerland

8.1 Relevant administrative bodies

The Federal Department of Home Affairs [Ordinance on foodstuffs of animal origin](#) governs animal-derived food products. However, the Ordinance (Article 2) does not recognize insects as an animal species accepted for food production.

After an initial interpellation on 25 November 2013 by Dr. Isabelle Chevalley, which was answered by the Federal Council as below, Dr. Chevalley proposed two new interpellation for [food](#) and [feed](#) on 21 March 2014. These interpellations are supported by members of the parliament.

The previous interpellation from 25 November 2013 [Dr. Isabelle Chevalley](#) National Councilor of Canton Vaud, Switzerland challenged the Federal Council on the following points. The questions were answered on [12 February 2014](#) (In French, German and Italian):

1. Is the Federal Council prepared to propose to Parliament a legislative amendment to allow the consumption of insects?
2. How to justify the prohibition of eating insects as hundreds of millions of people consume for millennia (Aristotle praised the exquisite taste of cicada nymphs)?

The consumption of insects is not prohibited in Switzerland. Consumers can eat insects which they collect in nature or breed themselves. The delivery and serving of insects as food, however is not allowed. Food law stipulates that only foods described in the food and commodities regulation 23 November 2005 ([LGV, SR 817.02](#)) are allowed as such to be placed on the market. Insects are not circumscribed in the LGV and therefore require, as all non- circumscribed food, authorization from the Federal Office of Food Safety and Veterinary Services so that they may be placed on the market. To date, no complete permit application has been submitted. There were, however, previously granted temporary and well-defined permits including obligations to protect the health for market tests, for example as show event in an exhibition. In the European Union, insects are regarded as "novel foods" and are subject to a license requirement.

In order to describe insects as food item, it must be proven in accordance with paragraph 13 of the Food Act 1 of 9 October 1992 ([SR 817.0](#)) that they do not threaten health in normal use. Up to date, however, no reliable data exists to show that insects produced for consumption do not contain toxic substances that can cause harm in situations of increased consumption.

Further, there is a lack of reliable data on whether insect proteins can cause allergies in certain population groups, and whether diseases can be transmitted to humans through the consumption of insects. Therefore, it is not yet possible to enable a regulation amending for the delivery of certain types of insects as food.

In order to protect of the environment and biodiversity, the Federal Assembly has regulated the handling of non-native invertebrates in closed systems ([Einschliessungsverordnung vom 9. Mai 2012; SR 814.912](#)), as well as the free-range trials for research purposes. ([Freisetzungsverordnung vom 10. September 2008; SR 814.911](#)). On the other hand, there are no standardized methods for breeding and production of insects for food purposes to date. Due to the multiplicity of insect species, this presents an extraordinary challenge and a controlled market is due to the above mentioned reasons not possible.

The consumption of specified insects could contribute to sustainable food production, including as an ingredient for animal feed. However, many fundamental questions remain currently unanswered. More research has to be undertaken in order to come to a final conclusion about the significance of insects as a protein source.

9. Netherlands

The implementation of [EC General Food Regulation 178/2002](#) is carried out by each member country to the European Union. Currently the Government of the Netherlands tolerates the sale of edible insect species listed on the [List of edible insects of the world](#) (April 4, 2012) (WUR, 2013). [Venik](#), an association that brings together growers of insects in the Netherlands, is currently preparing a dossier for the admission of mealworms as a novel food, as they are the insect species with the most research in regard to food safety and human consumption. Superworms and grasshoppers are the next in line for novel food application.

There is a substantial amount of evidence which can be used to make the case for safe consumption of insect in the Netherlands, including a clean track record of food safety (pers. comm., Peters, M. 19 November, 2013). At this time insect producers in the Netherlands conduct their own risk analysis and practice self-regulation based on private standards.

10. Belgium

In Belgium, marketing of the species indicated below must follow the general rules of EU Food Law are in force. Insect-based products must also follow good hygiene practices, traceability, labeling and the establishment a self-monitoring system based on HACCP principles.

- Acheta domesticus
- Locusta migratoria migratorioides
- Zophobas atratus morio
- Tenebrio molitor
- Alphitobius diaperinus
- Galleria mellonella
- Schistocerca americana gregaria
- Grylloides sigillatus
- Achroia grisella
- Bombyx mori

In September 2013, two insect-based spreads were released onto the Belgian market for sale by the company Green Kow. The chocolate and vegetable spreads contained a percentage of mealworms. Immediately after the launch of the products the Belgian [Agence fédérale pour la Sécurité de la chaîne Alimentaire](#) (Agency for Safety of the Food Chain) (AFSCA) banned the marketing of the products until [approval](#) had been received from the AFSCA.

The AFSCA is now discussing the [placement of edible insects on the Belgian market](#) as novel foods. However, this discussion is developing quickly and changes are expected to occur in 2014.

11. Germany

Since the BSE outbreak there is the so-called EU feed ban ([REGULATION \(EC\) No 999/2001](#)) in place which prohibited processed animal proteins (PAP) as feed for animals. The only exception was fish meal.

This feed ban has been lifted ([REGULATION \(EU\) No 56/2013](#)) due to the existing protein deficit (EU-level) and now feeding of processed animal proteins of non-ruminants in the aquaculture is also allowed. Since non-ruminant PAPs (includes pigs and chickens) cannot be chemically distinguished by existing detection methods and inter-species-recycling (cannibalism) is prohibited, there was no general lift for PAP as feed for non-ruminants.

Insects are not specifically mentioned Regulation No 56/2013. In Germany this law has been interpreted in a way that PAP of insects is generally not allowed as feed (since they are not slaughtered), not even in aquaculture (national level).

This feed ban does not apply to live insects, however. There is an official permission from Brussels to use live insects as feed (EU-level). However, German associations demand accreditation. A permission proposal has to be made in order to include live edible insects on the associations “positive list”.

[A proposal has to be made at the DLG](#) (Deutsche Landwirtschaftsgesellschaft) to list live insects on the positive list of the Standards Commission for Straight Feeding stuffs of the Central Committee of German Agriculture (Zentralausschuss der Deutschen Landwirtschaft; “Positivliste für Einzelfuttermittel”). This has not been approved as of January 2014.

12. United Kingdom

Within the United Kingdom insects are allowed to be sold as food due to a loophole found in the regulations. However, this is expected to change relatively soon and insect-based food products will have to undergo an application procedure to be classified as novel foods. According to the [Food Standards Agency](#) has recently published this statement: “Insects and other whole animals are currently exempt from the scope of the Novel Foods Regulation. This exemption is mainly because the wording of the existing Commission regulation does not mention insects and other whole animals such as insects. However, this will change with future changes to the Regulation resulting in insects, and similar whole animals that are currently marketed as foods in the European Union (EU) requiring a novel food safety assessment, unless they have been consumed to a significant degree in the EU prior to 15 May 1997.

In view of this, if you are planning to market insects or other whole animals in the UK as food, it may be sensible to confirm whether they were on the market in the EU to a significant degree prior to 15 May 1997. See the guidance below on demonstrating a significant history of consumption.

Intelligence gathered in the UK in 2011 identified a number of species that may have been on the UK market before May 1997, although this information is yet to be verified at EU level (FSA, 2013)”

[The Advisory Committee on Novel Foods and Processes](#) (ACNFP) has appointed a specialist in order to evaluate insects as food.

13. East Africa

The [Flying Foods](#) project in Kenya and Uganda overall objective is to develop a value chain of crickets among Dutch, Kenyan and Ugandan partners. This value chain includes rearing, processing, distribution and consumption.

The Kenyan partners of the project were going to offer a course on insect rearing in Uganda, but when they reached the border they were told that they could not enter Uganda because they were carrying wildlife. Under the [Uganda Wildlife Act](#) insects are considered wildlife and therefore the crickets could not be transported into Uganda from Kenya. Indigenous food are allowed for consumption, but not allowed for trade unless registered under the National Bureau of Standards. Thus, a standard needs to be created.

14. Conclusions & Recommendations (still under development)

Overall, mention of insects in regulatory frameworks governing food and feed seldom occurs; when there is mention of insects in these frameworks, they are usually mentioned for reasons of food hygiene (permissible limits) or as use as feed for pets like reptiles. In other cases, definitions such as “animal products” or “novel food”, are ambiguous and there is often uncertainty whether insects are included. Therefore, in some cases, the specific mention of insects as a food product in regulatory frameworks needs to occur in order to reduce ambiguity.

The inclusion of recommended edible insect species into the Codex Alimentarius would be a useful step in terms of international standards for the industry. Moreover, the addition of edible insect species into the Codex would also help Member countries to develop their own complementary standards. In order to do this importance should be placed on the development of data collection methodologies and procedures. Statistical data on edible insects is very sparse; international, regional and national overviews on the monetary contribution of edible insects to domestic and international trade is largely unknown. Therefore, it is difficult for standards to be developed, especially at the global.

Unfortunately we have not touched upon some of the other legislative issues relevant to insects as feed and food. For example, the overwhelming majority of insects are informally harvested from the wild populations in forested landscapes. Thus, there is little legislation governing the sustainable harvest of edible insects. For example, in Southern Africa widespread poverty in rural areas coupled with increasing poverty in urban centres has prompted overharvesting (FAO, 2013a). Moreover, a number of anthropogenic factors, such as pollution, wildfire and habitat degradation, have contributed to a decline in many edible insect populations. This has turned the promise of a new source of income and cheaper protein into a conservation dilemma.

The development of international standards for the wild harvest of insects could be developed, for example, after [The FairWild Standard](#) which assesses the harvest and trade of wild plants against various ecological, social and economic requirements.

The development of private standards by private companies can help serve in the development of national or regional standards. Just as lobby groups, such as insect producer groups, are emerging in different countries, their importance cannot be overstated. These groups play an essential role of raising the status of insects as feed and food.

Research projects, such as GREEiNSECT and PROteINSCT, will remain an important source of information regarding the insects as feed and food value chain. This data in turn can help to build up the existing evidence base for insects as feed and food.

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