

The IFOAM STANDARD for ORGANIC PRODUCTION and PROCESSING

Draft version 1.1 of the IFOAM Standard for invertebrates

Compilation of comments and responses from the IFOAM Standard Committee

Comments received during the first expert consultation period in January – February
2021

Responses prepared from June 2021 to January 2022

7. This chapter applies to: • production of invertebrates and products derived from them which are marketed as certified organic for human food, animal feed or for any other purpose in organic supply chains;

Comment IPIFF (International Platform of Insects for Food and Feed):

On this occasion, does 'animal feed' include 'pet food'? We feel the need to add a couple of examples. Typically, the use of insect-based fertilizer (i.e. 'frass') is of relevance for the subject of organic farming. Add at the end (e.g. fertilizer production, ...);

Response: the use of the word "feed and food" should cover all categories. Animal feed should cover pet food.

There is no need to address fertilizer production separately as this is already addressed in other chapters of the IFOAM Standard (such as on animal husbandry).

7.1. General Principle. In the context of this chapter, organic terrestrial invertebrate production provides protein for use in animal feed and human food as well as ingredients for organic cosmetic products and textiles. It is based on a resource efficient production system that complies with the four principles of organic agriculture which respects both the physiological and behavioral needs of the species concerned and minimizes any negative environmental impact.

Comment AFFIA (The Asian Food and Feed Insect Association)

The word "protein" may be replaced by "ingredient" in line with the diversity of nutrients contained in edible insects. (The fractionation method can lead to various ingredients such as lipids following a mechanical process for example). The range of applications may be phrased in a more open manner to account for the continuously discovered applications such as for pharmaceutical applications.

Comment Silvia Cappellozza, Researcher, CREA-AA

In the context of this chapter, organic terrestrial invertebrate production provides protein and fats, or other additives for use in animal feed and human food as well as ingredients for organic cosmetic products and fibers or dyeing for textiles. It is based on a resource efficient production system that complies with the four principles of organic agriculture which respects both the physiological and behavioral needs of the species concerned and minimizes any negative environmental impact.

Response: the Committee agreed on the sentence (...) "provides ingredients for use in organic food and feed as well as non-food products". However concerns still remain as "ingredients" are used in a compound product. When insects are sold individually (e.g. snails) they are not ingredients.

The Committee would propose to leave "ingredients and proteins", but will be open for comments in another consultation.

Comment AFFIA

The document recommends several practices as being “suitable”. We believe these recommendations shall be based on recognized references, which to date may not always be available. (e.g. method of killing to “minimize” animal suffering). The availability and recognition of such references shall be ensured before suggestions are made standard for organic production. In the document below, we refer to this general comment “1.A” for the recommended practices requiring clear definition and references. This shall prevent misunderstandings from producers and provide clear criteria for the certification of organic products vs non-organic ones.

Response: the comment applies throughout the standard. Since the invertebrates production is a sector at its incipient stage, we deem that we do not have sufficient knowledge to frame the standard more precisely for now. Additionally, the standard should not be too species-related otherwise it risks to not be applicable to all types of organic invertebrates’ production.

7.1.1. Invertebrates may be reared entirely indoors in controlled environments, except for snails, which must have access to pasture.

Comment AFFIA:

It may be relevant to clarify what are “indoors” and “controlled environment” and if the above wording means that invertebrates “may NOT” be reared outdoor at all, at any given life stage. (For example, farms may have a part in green house with a breeding stage and part in a completely closed facility with a growing stage). To this point biosafety requirement may be defined to prevent biological invasion.

Response: We do not want to overregulate and we leave this chapter as it is. Further comments might come later, we will keep observing the application of the standard. Article 7.1.3 of the chapter specifies conditions that need to be followed.

Comment Horizon Insects

Would not use the word ‘may’ when referred to insects. Insects must be kept in a closed environment like vessels, containers etc.

Response: we give the possibility for indoor/outdoor rearing but in the sense of a possibility, not an obligation. As commented above, we do not want to risk to overregulate the sector since it is at its infancy and new evidence on indoor/outdoor requirements for certain species might come up later.

Comment Silvia Cappellozza, Researcher, CREA-AA

Invertebrates may be reared entirely outdoors or indoors in controlled environments, or in a mixed way (for example egg hatching and first instars indoors, grown instars

outdoors) except for snails, which must have access to pasture.

Response: “may” already covers these aspects. So it includes the possibility of mixed rearing systems, too.

7.1.2. The operator shall ensure that the environment, the facilities, stocking density and the population size provide for the behavioral needs of the invertebrates.

Comment AFFIA

1A the document recommends several practices as being “suitable”. We believe these recommendations shall be based on recognized references, which to date may not always be available. (e.g. method of killing to “minimize” animal suffering). The availability and recognition of such references shall be ensured before suggestions are made standard for organic production. In the document below, we refer to this general comment “1.A” for the recommended practices requiring clear definition and references. This shall prevent misunderstandings from producers and provide clear criteria for the certification of organic products vs non-organic ones.

Response: the comment applies throughout the standard. See the response to the comment in section 7.1.

Comment Horizon Insects

This will vary considerably for each species. Will there be a separate document describing the rearing conditions for each?

Response: IFOAM standards are always rather general and used many times as basis for other standards/regulations. Standards for specific rearing conditions would risk leaving something out - in other words, if we write a standard for each species, then we potentially stifle innovation.

Comment IPIFF

Extract from the IPIFF Contribution paper on organics (March, 2019): ‘...the setting of maximum population density levels (as foreseen under the general livestock rules - annex II part II point 1.6.3) is irrelevant in the case of farmed insects: many species indeed thrive when bred densely populated. We therefore plead for applying a derogation from the ‘general’ livestock requirement which concerns stocking density’.
Source: https://ipiff.org/wp-content/uploads/2019/03/IPIFF_Contribution_Paper_on_EU_organic_certification_of_insect_production_activities_29-03-2019.pdf

Response: the stocking density may be high for some species. Article 7.1.2 allows for dense population if the species needs require it.

7.1.3. In particular, the operator shall ensure the following animal welfare conditions:

Comment IPIFF

While ‘farmed insects’ are not subject to EU animal welfare standards, IPIFF is ‘...committed to promoting good welfare practices in insect husbandry, transport and at the point of death. Along that line, we have recently developed a reflection paper which aims to promote animal welfare standards for insect producers in Europe (i.e. the document is available through the following link: <https://ipiff.org/wp-content/uploads/2019/02/Animal-Welfare-in-Insect-Production.pdf>)

Response: The Standard Committee read through the article and considered the outdoor/indoor conditions according to the species. For the time being, article 7.1.3 will be left as originally proposed by the Committee as the animal welfare conditions are already listed in the requirements for 7.1.3, so they are implicitly addressed when the principles are listed and as thus will have to be respected.

7.1.3. b. sufficient fresh air, water, feed (except in the degutting phase), thermal and humidity comfort and photoperiod, as needed to satisfy the natural needs of the invertebrates;

Comment AFFIA

The suggestion for “sufficient fresh air” appears potentially contradictory with the requirement of indoor rearing practices. This may possibly be replaced by the requirement of “adequate ventilation for a given specie”.

Response: sufficient fresh air does not exclude ventilation, as long as it comes from the outside. Fresh air does not contradict indoor rearing.

Comment Horizon Insects

Degutting does not apply to invertebrates. We think this refers to ‘purging/fasting’

Response: We will replace “degutting” by “purging”.

7.1.3. c. freedom from stress and pain;

Comment AFFIA

References for such requirement might be scarce. In addition, there might be an overlap with point 7.1.11.

Response: standard 7.1.11 is about the prohibition of mutilations of living

invertebrates (with practices as removing of legs and trimming of wings) so there is no contradiction.

The Committee agreed on replacing “freedom” with minimizing since the word “freedom” entails a lack of something. In some cases, it was proven that some species of insects do not experience pain, while this is not documented yet for some invertebrates. The Committee decided to keep “pain” to be consistent with the other chapters of the IFOAM Standard, also because even if not documented, it will be good to have it in the standard if at some point it is proven that they experience pain.

7.1.3. Add specificities for specific groups

Comment AFFIA

1A. The document recommends several practices as being “suitable”. We believe these recommendations shall be based on recognized references, which to date may not always be available. (e.g. method of killing to “minimize” animal suffering). The availability and recognition of such references shall be ensured before suggestions are made standard for organic production. In the document below, we refer to this general comment “1.A” for the recommended practices requiring clear definition and references. This shall prevent misunderstandings from producers and provide clear criteria for the certification of organic products vs non-organic ones.

Response: the comment applies throughout the standard. See the response to the comment in section 7.1.

Comment Gonçalo J. Costa, founder of The Cricket Farming CO

Coprophagy (eating feces) is a common behavior within Blattodea (termites + cockroaches). It enables that newly hatched nymphs have access to micronutrients and beneficial gut microbiome. Studies in *Periplaneta Americana* show that it promotes normal growth versus sterile lines. (doi:10.7717/peerj.6914). Thus, as an example nymph of cockroaches should be allowed access to adult cockroach feces to promote a healthy growth.

Response: this specific requirement is not prohibited by our standard. If this information is included, it might risk to become too species-specific.

Comment from Florian Berendt, Agricultural engineer, EntoSus GmbH

4.1 Coleoptera (beetles) The lesser mealworm (or buffalo worm) *Alphatobius diaperinus* and the mealworm *Tenebrio molitor* are bred on dry substrate which is at the same time their main source of food. Care must be taken to provide the humidity and temperatures required by these species to create ideal conditions for their development (humidity more than 30%, temperatures between 25°C and 35°C).

Breeding occurs in half-light or complete darkness.

Response: unless we write standards for specific invertebrates' species, we do not need to include this requirement.

Comment from Florian Berendt, Agricultural engineer, EntoSus GmbH

4.2Diptera (flies) The production of larvae of the house fly *Musca domestica* and the soldier fly *Hermetia illucens* occurs on moist substrate created from vegetable and non-vegetable by-products and residual materials. (Leftover feed from other insect species are possible) Stocking density should be such that the substrate in the production containers is continuously and completely turned over by the movements of the larvae. The parent flies deposit their eggs in suitable flight cages or nets. Care must be taken to provide the humidity and temperatures required by these species to create conditions ideal for development (50%-70% humidity, temperatures between 24°C and 40°C).

Response: unless we write standards for specific invertebrates' species, we do not need to include this requirement.

Comment from Florian Berendt, Agricultural engineer, EntoSus GmbH

4.3Saltatoria (grasshoppers) House crickets *Acheta domestica*, tropical house crickets *Gryllobates sigillatus* and Jamaican field crickets *Gryllus assimilis* are bred on the basis of vegetable by-products and residual materials in appropriate production containers. It is necessary to install tiered hiding spots for the adult and emerging insects. The egg depositing trays must be replaced by empty trays every one or two days. In this way hatching can take place in fresh production containers and the necessary size grading operations kept to a minimum. Care must be taken to maintain temperatures between 25°C and 32°C in the breeding containers, with approx. 30-50% humidity and dim lighting following a rhythm of day and night.

Response: unless we write standards for specific invertebrates' species, we do not need to include this requirement.

7.1.3. g in addition to these general welfare conditions for all invertebrate categories, provisions for specific invertebrate groups also have to be taken into account.

Comment IPIFF

7.1.3. g in addition to these general welfare conditions for all invertebrate categories, provisions for specific invertebrate groups also have to be taken into account, such as light requirements, stocking density, prevention of cannibalism, etc. which may be specific to certain invertebrates (e.g. farmed insects).

Response: the Committee agrees this is a relevant addition to the standard. The part “such as light requirements, stocking density, prevention of cannibalism” was added to 7.1.3g.

7.1.3.

Comment Silvia Cappellozza, Researcher, CREA-AA

Add: f. protection from predators (birds, lizards, ants...) through physical methods (for example nets protecting window openings), g. protection from occasional contamination due to pesticide drift (although not directly used for crops used as feed for the insects themselves), through small-group sampling before administering to mass-rearing.

Response: these provisions are already covered by other articles. Articles 7.1.9 deals with predation, 7.1.2 with density, 7.1.5 with light, and 7.1.14 cannibalism. Regarding the addition of a point G, the Committee assessed that contamination due to pesticide drifts is minimal for organic feed and we do not see the necessity to include it in this chapter.

7.1.4. For invertebrates kept indoors, measuring instruments for the control of temperature, humidity and, concentration of CO₂ and where possible other damaging gases must be regularly used in all accommodation facilities. The measurements and all measures taken to improve housing conditions must be recorded.

Comment AFFIA

Link to comment for point 7.1.1, the definition of indoor/outdoor may be required. (E.g. is a greenhouse with mesh walls indoor?)

Response: the Committee recommends that the understanding of indoor/outdoor is decided by operators and inspectors. We shall not define indoor/outdoor otherwise all the IFOAM Standard would require such definitions.

So 7.1.4 of the standard would then read: *In facilities with a controlled environment, temperature, humidity, concentration of CO₂ and other damaging gases must be regularly monitored and appropriate measures must be taken to improve environmental conditions, when needed.* Monitoring and measures taken must be recorded.

Comment from Florian Berendt, Agricultural engineer, EntoSus GmbH

7.1.4. For invertebrates kept indoors, measuring instruments for the control of temperature, humidity and concentration of CO₂ and other damaging gases must be regularly used in all accommodation facilities. The measurements and all measures taken to improve housing conditions must be recorded. Delete where possible.

Response: The Committee agrees to take “where possible” out. See 7.1.4 as agreed in point above.

Annabel Schuh, Naturland

it is important to measure CO2. Delete “where possible”.

Response: The Committee agrees to take “where possible” out. See 7.1.4 as agreed in point above.

7.1.5. The maximum number of hours of artificial light used to prolong natural day length shall reflect the natural photoperiod of the *species* and stage of development and not adversely affect the natural behavior, and general health of the invertebrates. Lighting shall not produce a stroboscopic effect (e.g. fluorescent light).

Comment from Gonalo J. Costa, founder of The Cricket Farming CO

Species, not specie. Specie refers to a specific currency or coin, check the Webster-Merriam dictionary

Response: agreed. Replaced specie by species in the whole standard.

Comment AFFIA

1A. The document recommends several practices as being “suitable”. We believe these recommendations shall be based on recognized references, which to date may not always be available. (e.g. method of killing to “minimize” animal suffering). The availability and recognition of such references shall be ensured before suggestions are made standard for organic production. In the document below, we refer to this general comment “1.A” for the recommended practices requiring clear definition and references. This shall prevent misunderstandings from producers and provide clear criteria for the certification of organic products vs non-organic ones.

Response: the comment applies throughout the standard. See the response to the comment in section 7.1.

7.1.6. Construction material, equipment, structural or furnishing elements, bedding materials, and substrate that come into contact with the invertebrates shall meet the following requirements:

Comment AFFIA

A clear list of authorized material may be defined along with testing requirements. Plus, comment 1A.

Response: The Committee agreed that a-b-c already have a clear indication of materials to be used, therefore a more specific list is not necessary. The Committee changed 7.1.6 c to “species” (Article 7.1.6 c: materials or structural

elements which are re-used and not usually disposed of shall consist of natural or food grade materials. Use of materials with toxic or potentially toxic effects on the *species* raised or on human health is prohibited.)

Comment Isobel Swinscoe, Beta Bugs

It is not technically practicable to source housing material for containment of BSF at any life stage which would meet this standard required whilst also remaining cost-effective, meeting our own biosecurity standards (i.e. enable effective cleaning and disinfection between insect groups, generations and lines) and allowing for adequate temperature, humidity, air flow and light within the container whilst also preventing insects from escaping. As a breeding company individual strain security of breeding lines and populations is critical.

Response: Only point C of 7.1.6 refers to this comment. The materials which are re-used should not consist of toxic material. They should consist of natural or food grade material. This clarification is a clear indication of the quality of the materials and should make it easier to the operator to know what type of material he/she is using

Comment Horizon Insects

Last year we were asked to comment by the EFSA on an Appendix regarding the feed allowed. Whatever is described here, should be consistent with what is in the regulations. Better still, it should just refer to it.

Response: There are no discrepancies with EFSA; in addition to this, it is not common practice to reference other standards in the IFOAM Standard.

Comment Horizon Insects

Besides [toxic glues and colored ink?], an important aspect that should be covered is the possible contamination and subsequent infestation caused by the presence of insect eggs in the discarded substrate. (the same comment applies to 7.1.15)

Response: 7.1.6 is about construction material; this comment applies more to 7.1.15 and 7.1.10.

The committee agreed on strengthening the standard 7.1.10, which applies to non-endemic species, by modifying it into: *Whenever non-endemic species are raised, the management, ~~facilities~~ and accommodation facilities **must** prevent the escape of living invertebrates at any stage of development into local natural habitats.*

Standard 7.1.15 is also modified so to prevent the negative environmental impact coming from the handling and disposal of organisms/waste (does not only apply to non-endemic species): *Waste, including organisms, from organic invertebrate production units shall be handled and disposed of in a way that does not negatively impact the environment.*

7.1.7 Operators shall manage pests and diseases in invertebrate housing using only the following methods:

c. preventive actions such as disruption, proper elimination of contaminated material, habitat management and removing access to facilities;

Comment Silvia Cappellozza, Researcher, CREA-AA

7.1.7. c. preventive actions such as disruption, proper elimination of contaminated material **or individuals or batches**, habitat management and removing access to facilities;

Response: the Committee accepted this comment and modified as following: Preventive actions such as disruption, proper elimination of contaminated material, removal of individuals or batches, habitat management and removing access to facilities

e. substances (other than pesticides) used in traps

Comment North American Coalition for Insect Agriculture (NACIA)

Suggest elimination of “other than pesticides.” Substances in baits or traps that do not have contact with crops can be addressed by IFOAM Norm of July 2014 Section 7.4.3: 7.4.3 The direct use or application of a prohibited method or material renders that product no longer organic. The operator shall take necessary precautions to prevent contamination, including the removal of organic products and related packaging materials from the storage or processing facility, and measures to decontaminate the equipment or facilities. Application of prohibited substances to equipment or facilities shall not contaminate organic product handled or processed therein. Application of prohibited substances to equipment or facilities shall not compromise the organic integrity of product handled or processed therein and shall be documented to attest this.

Response: The Committee decided to keep this point as it was to ensure consistency throughout the IFOAM Norms, as this part was already used in the Animal Husbandry and Processing sections (see 5.1.6c and 7.4.1d)
If it will be then considered that it is not consistent with principles of organic agriculture then it will have to change in the IFOAM Norms document. For the substances allowed in the IFOAM Norms, see requirement 5.8.7 of the IFOAM Standard.

7.1.8. The use of synthetic allopathic veterinary drugs or antibiotics is prohibited in organic invertebrates' production. Only substances listed in the Appendices and requirement 5.9.7 of this standard, as well as phyto-therapeutic and homeopathic

treatments, are permitted in the management of pests and diseases on the organic invertebrates' unit of production.

Comment AFFIA

This appears as suitable requirement. In addition, the species farmed by AFFIA members have a short lifecycle duration preventing any relevant use of drugs. Fallow periods including slaughtering and disinfection may represent more suitable practice in the case of contamination.

Response: The comment does not propose any change in the standard.

Comment Horizon Insects

Could not locate 5.9.7 in this document or IFOAM norms main document. Hopefully this forbids the use of pupation inhibitors and growth hormone, which are routinely used for in the insects bred for the reptile industry. Cannot comment about substances used for pest management as we have never used any.

Response: Requirement 5.9.7 is changed into 5.8.7 in the standard. The requirement 7.1.8 is modified by the SC as follows: *Synthetic allopathic veterinary drugs, antibiotics, hormones and pupation inhibitors are prohibited in organic invertebrates' production. Only substances listed in the Appendices and requirement 5.8.7 of this standard, as well as phyto-therapeutic and homeopathic treatments, are permitted in the management of pests and diseases on the organic invertebrates' unit of production.*

Comment Silvia Cappellozza, Researcher, CREA-AA

7.1.8. Synthetic allopathic veterinary drugs, antibiotics, **hormones** and pupation inhibitors are prohibited in organic invertebrates' production. Only substances listed in the Appendices and requirement 5.9.7 of this standard, as well as phyto-therapeutic and homeopathic treatments, are permitted in the management of pests and diseases on the organic invertebrates' unit of production.

Response: The SC agreed – see changes to the requirement in the comment above.

7.1.10. Whenever non-endemic species are raised, the farm, facilities and accommodation facilities are designed to prevent the escape of living invertebrates at any stage of development into local natural habitats.

Comment Silvia Cappellozza, Researcher, CREA-AA

This is quite difficult in the case of insects, so that using endemic species should be preferred not only because of the possible invasion from alien species but because of sanitary issues too (virus, bacteria and fungi transmission to wild local insects).

Response: The SC agreed on extending the requirement to all species, not just the

non-endemic ones, since all type of species' escape should be prevented. The requirement 7.1.10 will be as follows: *The management, facilities and accommodation facilities shall be designed to prevent the escape of living invertebrates at any stage of development into local natural habitats.*

7.1.11. Mutilations such as the trimming of wings or removing of legs are prohibited.

Comment AFFIA

Despite the application of the standard to the production of invertebrates, it may be relevant to clarify the application of such requirement to the living stage of the insects only.

Response: The SC agreed to add living invertebrates to the requirement. 7.1.11 will be as follows: Mutilations of living invertebrates such as the trimming of wings or removing of legs are prohibited.

Comment Gonçalo J. Costa, founder of The Cricket Farming CO

Well... you should refer that the mutilations are off-limits when they're alive.

Response: The SC agreed to add living invertebrates to the requirement. 7.1.11 will be as follows: Mutilations of living invertebrates such as the trimming of wings or removing of legs are prohibited.

Comment IPIFF (International Platform of Insects for Food and Feed)

Modify to: 7.1.11. The **intentional** mutilation of the invertebrate animals, such as the trimming of wings or removing of legs is prohibited. Rationale: certain species might accidentally lose a piece of wing or a segment of the leg.

Response: the SC agreed that when unintentional, it is not defined as mutilation.

7.1.13. The method of killing shall ensure rapid death and minimize animal suffering.

Comment Annabel Schun, Naturland

Killing should be more precisely described, for ex Killing must be performed on the premises as quickly and carefully as possible and by the farm itself, to spare the insects unnecessary suffering. This is done by temperature shock in order to bring about a painless death as quickly as possible. Killing may also be performed by deep-freezing the insects at least -18°C, by super-heated steam or boiling water

Response: The SC does not agree on providing all those details in the standard, as this could be too restrictive and not applicable to different types of facilities in various world regions. The SC agreed on adding "rapid death" to the requirement, as it

would add clarity to it. The requirement will look as follows: The method of killing shall ensure rapid death and minimize animal suffering.

7.1.14. Cannibalism shall be minimized by appropriate measures

Comment Horizon Insects

This is quite vague. Cannibalism can be caused by lack of space or lack of protein in the feed. Again, in this standard we would like to see some parameters specified on a specie by specie basis.

Response: The SC agreed that the word “minimized” acknowledges that there is some cannibalism in certain species; it aims at preventing cannibalism when non “naturally occurring”.

Comment IPIFF (International Platform of Insects for Food and Feed)

This should not apply to farmed insects. Cannibalism is for some species’ natural instincts. One must therefore acknowledge that those behaviors cannot be completely prevented in insect farming, while these contradict animal welfare paradigms. We therefore suggest to delete the reference to the ‘prevention of cannibalism’.

Source: https://ipiff.org/wp-content/uploads/2019/03/IPIFF_Contribution_Paper_on_EU_organic_certification_of_insect_production_activities_29-03-2019.pdf

Response: The SC agreed that the word “minimized” acknowledges that there is some cannibalism in certain species; it aims at preventing cannibalism when non “naturally occurring”.

7.1.15. Waste from organic invertebrate production units shall be handled and disposed of in a way that does not contaminate the environment.

Comment Horizon Insects

Besides [toxic glues and colored ink?], an important aspect that should be covered is the possible contamination and subsequent infestation caused by the presence of insect eggs in the discarded substrate. (the same comment applies to 7.1.6)

Response: The SC agreed, following the discussions on the Comments from Horizon Insects on requirement 7.1.6, that the requirement would be modified as follows: *Waste, including organisms, from organic invertebrate production units shall be handled and disposed of in a way that does not negatively impact the environment.* This will cover living organisms that might be present in the discarded substrate.

Comment AFFIA

It may be clarified that the insect frass does not represent a waste (valuable product) and that its valorization may be done through direct application in the field.

Response: The SC sees frass as a waste but that does not negatively impact the environment.

Comment Annabel Schun, Naturland

Does this mean that the excrements can be used on organic agriculture as fertilizer?
Naturland standard: Excrement resulting from the production of the insects should be spread on organically farmed areas in conformity with conditions applying to permissible nutrient limits. Top priority is to be given to the prevention of diseases and pests by applying suitable hygienic measures.

Response: The newly formulated requirement 7.1.15 does not hamper the possibility of using as fertilizer, as long as it does not negatively impact the environment.

Comment IPIFF (International Platform of Insects for Food and Feed)

7.1.15. Waste from organic invertebrate production units shall be handled and disposed of in a way that does not contaminate the environment **and do not spread diseases not only to man but to other wild insects too.**

Response: The word environment is interpreted as including man and other insects.

7.1.16. The species being produced must only move or forage in organic or untreated land. The natural movement of the species must be evaluated, and the potential area where the species potentially moves or forages must be only organic or untreated land.

This does not appear realistic in the context of indoor farming and shall be clarified following the clarification of what indoor is.

Response The SC agreed that this requirement applies to species being produced outdoors. The requirement is modified as follows: *Species being produced outdoors must move or forage only in organic or untreated land. The natural movement of the species must be evaluated, and the potential area where the species potentially moves or forages must be only organic or untreated land.*

Comment Gonçalo J. Costa, founder of The Cricket Farming CO

Doesn't this go against 7.1.1? Or it is only applicable to i.e snails that need access to green pastures?

Response The SC agreed that this requirement applies to species being produced outdoors. The requirement is modified as follows: *Species being produced outdoors*

must move or forage only in organic or untreated land. The natural movement of the species must be evaluated, and the potential area where the species potentially moves or forages must be only organic or untreated land.

Comment Annabel Schun, Naturland

Which measures are taken to assure that the species cannot escape to the surrounding environment?

Response: this comment is addressed in 7.1.10, which is modified as follows: The management, facilities and accommodation facilities shall be designed to prevent the escape of living invertebrates at any stage of development into local natural habitats.

Comment Horizon Insects

Does this section refer to arthropods only? If so it should be made clear

Response The SC agreed that this requirement applies to species being produced outdoors. The requirement is modified as follows: *Species being produced outdoors must move or forage only in organic or untreated land. The natural movement of the species must be evaluated, and the potential area where the species potentially moves or forages must be only organic or untreated land.*

7.2. General principle: Organic invertebrates are born and raised on organic holdings. Production systems that change from conventional to organic production require a conversion period.

Comment Florian Berendt, Agricultural Engineer, EntoSus GmbH

Conversion periods: One complete reproduction cycle covers development from the egg to the imago for each species of insect. Every stage of development of subsequent reproduction cycles is qualified as organic provided that all the requirements for organic production as described hereafter are complied with. Non-organic breeding insects attain organic status after laying their first eggs.

Side note: The insects derive from organic sources. Ideally, the stock should be raised on the production site itself. Where this is not possible (the farm manager has reported this and proved that organic stock is not available), the following conditions apply when purchasing stock from conventional sources: •For purposes of the initial establishment of stock, non-organic breeding insects may be used, with no limits imposed. Where necessary, it is permissible to re-establish the stock of one species of insect by using non-organic breeding insects if external factors have inflicted damage on the original stock. When acquiring stock, it is important to adopt appropriate measures of hygiene and quarantine to prevent parasites, viruses, spiroplasms and other micro biotic pathogens from being introduced to and spreading through the organically certified breeding facility.

Response: this is covered in requirement 7.2.2

Comment AFFIA

The conversion period may be defined such as with a minimum number of lifecycles.

Response: this is covered in requirement 7.2.2

Comment Annabel Schun, Naturland

How long does the conversion period take and what kind of actions does the conversion implicate? Within the Naturland standard it is written, that the conversion period is one complete reproduction cycle which covers development from the egg to the imago for each species of insect. Every stage of development of subsequent reproduction cycles is qualified as organic provided that all the requirements for organic production as described hereafter are complied with. Non-organic breeding insects attain organic status after laying their first eggs.

Response: see requirements 7.2.1 and 7.2.2

Comment IPIFF (International Platform of Insects for Food and Feed)

Would this imply that a diverse farming system (e.g. organic insect farming + conventional poultry farming) would not be eligible for certifying the insects? (organic holdings)

Response: holding stands for specific physical unit that is organically managed. In order to clarify, the SC agreed on replacing holding with production units. Requirement 7.2.3, as modified by the SC, addresses parallel production: *Parallel production of invertebrates is allowed only when organic and non-organic units are physically, financially and operationally separated.*

7.2.1. All invertebrate requirements in this standard shall be met for the duration of the conversion period before the resulting product can be considered as organic. Where invertebrates are raised on living plants or soil, the plants shall be organic and the land shall comply with land conversion requirements.

Comment AFFIA

See comment to point 7.16. Link to comment for point 7.1.1, the definition of indoor/outdoor may be required because the introduction of plant of soil may lead to contamination. (Pest, predator).

Response: the SC is not saying “must”, but “where”; when invertebrates are raised on living plants or soil, then plants shall be organic and the land shall comply with land conversion requirements.

Comment AFFIA

When insects use structural elements attention should be paid that they do not contain any undesirable substances (e. g. plasticizers, preservatives, synthetic pesticides) and none which may lead to contamination (e. g. by substance migration from printing ink). Any insect boxes used are made of recyclable, food-grade materials. The housing materials and compartments must be kept in a satisfactory hygienic condition in order to safeguard the insects' health. We think if plants are being used, it should also be free of pesticides. More important is that the soil in which the insects feed is organic or free of contaminants.

Response: Already in the standard (covered also in 7.1.6)

7.2.2. Invertebrates and products derived from them are considered organic only if the parental generation have been organically managed for their entire life

Comment AFFIA

This appears as a suitable requirement but exceptional cases could be developed such as in the case of no organic parental generation available in the area when starting a new production.

Response: the SC modified 7.2.2 as follows: *Invertebrates and products derived from them are considered organic only if the parental generation has been organically managed prior to the beginning of its reproductive stage.*

Isobel Swinscoe, Beta Bugs

We consider the suggestion in the draft chapter that farmed insects and insect products can only be certified as organic if the parent stock has been organically managed for its entire life to be excessively stringent in its demands on suppliers of genetics to insect farmers. The legal framework for implementing the EU's organic production policy should aim at providing conditions under which the policy can progress in line with production and market developments (Reg (EU) 2018/848 on the organic production and labelling of organic products) (<https://www.legislation.gov.uk/eur/2018/848/data.pdf>). Producing and distributing improved BSF genetics is a specialized sector of the insect production industry. To be restricted to sourcing expensive organic feed for rearing organic BSF, with the infrastructural demands required to physically separate organic and non-organic lines, simply to produce eggs which could be reared organically by farmers, would not be commercially feasible and would impinge on future expansion of the sector. The financially rational decision for genetics suppliers would therefore be to not pursue production of genetics for the organic sector, with the result that the organic insect industry would lose out on the productivity gains and increased revenue accessible by the non-organic insect industry. Reg (EU) 2018/848 states that organic animals are not always available in sufficient quantity or quality to meet the needs of farmers who wish to constitute a new stock of animals, or to increase or renew their livestock. Under certain conditions it should therefore be possible to bring non-organically

raised animals to an organic production unit. Organic poultry producers, for example, can bring in non-organically reared poultry if i) a flock is established for the first time, or renewed or reconstituted or ii) if organic poultry supplies cannot meet the qualitative or quantitative needs of the production system (Reg (EU) 2018/848, Annex 2, Part II, 1.3.4.3; European Rural Poultry Association; ELPHA). The products from these non-organically reared poultry then undergo a conversion period to be considered organic. This rule applies to organic livestock systems generally and should extend to the insect sector. For breeding purposes, non-organic young animals may be introduced when the stock is constituted for the first time (Reg (EU) 2018/848, Annex 2, Part II, 1.3.4.4.1). Furthermore, for breeding purposes, non-organic male and non-organic nulliparous female animals may be introduced for renewal of stock, to be subsequently reared in accordance with organic production rules (Reg (EU) 2018/848, Annex 2, Part II, 1.3.4.4.2). In fact, up to 40 % of animal stock in organic farming can be introduced initially as non-organic in response to i) major farm expansion, ii) one breed being replaced with another or iii) a new livestock specialization has been initiated (Reg (EU) 2018/848, Annex 2, Part II, 1.3.4.4.3). The only stipulation in the Regulation for organic reproductive material and organic varieties is for organic plant production. There is, therefore, no legal requirement that genetic breeding stock imported to the EU (or exported from the EU) be organically produced. The IFOAM NORMS for Organic Production and Processing (v. 2014) state that the organic guarantee systems require that animal production systems raise animals organically from birth or hatching, or when this is not possible, from early ages subject to a minimum transition/ conversion requirement. It seems prescient that Reg (EU) 2018/848 includes the clause that enables the Commission to extend relaxations and exemptions concerning the use of non-organic livestock for breeding purposes, five years after the date of application of this Regulation. The underlying reason for the clause is their acknowledgment that such material may not be available in organic form on the EU market and that the Commission may need to take account of possible limited access of organic operators to such material. Finally, Annex 2, Part II, of Reg (EU) 2018/848 states that when choosing breeds or strains, organic operators should give preference to high genetic diversity, breeding value, vitality and disease resistance, amongst other desirable traits. In the context of sourcing genetics, it is evident that the emphasis is on the soundness of the breed or strain, rather than its organic credentials.

Response: 7.2.2 already allows non-organic stock to come in for breeding purposes. Most insects have very short life cycle (with very few exceptions). Requirement 7.2.2 is modified as follows: *Invertebrates and products derived from them are considered organic only if the parental generation has been organically managed prior to the beginning of its reproductive stage.*

Comment Annabel Schun, Naturland

How is the exact reproduction cycle defined? We think that conventional input of insects can be controlled / avoided if a proper management plan can be presented by the company which includes measures of hygiene and quarantine to prevent parasites,

viruses, spiroplasms and other micro biotic pathogens. Additionally, an application is always required before sourcing conventional insects.

Response: reproductive cycle is defined as the phase when invertebrates reach their adult reproductive stage (stage where the species are sexually mature and can reproduce).

The application of the standard is then controlled by Certification Bodies (CBs).

We think this will suffice. However, we are unsure what for example is the practice for poultry. If a farmer buys incubated eggs from not organic hens and then raises the chicks on his organic farm, are the chicks organic? If yes, then it is worth drawing a parallel with mealworms. They go through a 4-stage lifecycle, from beetle to, egg, larva and pupa. Only the larva is commercialized/edible. Beetles live and feed on the substrate (typically bran). So, for example I could breed the beetles in a not organic bran substrate, let them lay the eggs. When the larvae emerge, I can feed them with an organic feed.

Response: the SC agreed on modifying the requirement as follows: *Invertebrates and products derived from them are considered organic only if the parental generation has been organically managed prior to the beginning of its reproductive stage.*

For insect producers, this requirement is not feasible. Firstly, there is no organic insect production at this stage (i.e. where should the first organic individuals come from?). Secondly, considering the local nature of organic farming – sourcing organically farmed individuals might lead to logistical constraints (e.g. transporting organic eggs/larvae from one side of the continent to the other).

Response: the SC agreed that the parental generation may come from outside of the organic production units; from reproduction, they should be managed organically.

Comment Silvia Cappellozza, Researcher, CREA-AA

Generally speaking, it might be a good practice to introduce new individuals in a colony to favor outbreeding, as continuous inbreeding can result in the population weakening. However, once/twice per year might be a reasonable limit.

Response: the standard already accommodates that.

7.2.4. Parallel production of invertebrates is allowed only on the condition that the operator takes appropriate measures to guarantee full physical and financial separation in order to prevent any risk of contamination or co-mingling of inputs or products.

Comment AFFIA

The “financial separation” may be clarified as it appears unrealistic as it is. It may be referring to the logistical split between potential parallel productions.

Response: the SC agreed to change the requirement as follows: *Parallel production of invertebrates is allowed only when organic and non-organic units are physically, financially and operationally separated.*

This will ensure consistency with the whole text of the IFOAM Norms.

7.3. Invertebrate nutrition. Organic invertebrates receive their nutritional needs from organic feed

Comment from Florian Berendt, Agricultural engineer, EntoSus GmbH

The used feed for organic invertebrates exists primarily from organic by products or residuals from organic food and/or feed production or processing which does not competes with food for human consumption. If only by products or residuals from conventional food production and processing are available (for example in cities without agricultural production) should this be used preferred to organically grown food which can be used for human consumption.

Response: this requirement is consistent with other feeding requirements in the standard for animal husbandry, so there is no differentiation for invertebrates. The box on regional exemption foresees some exceptions in the case of lack of availability of feed from local sources.

Comment Isobel Swinscoe, Beta Bugs

If BSF genetics produced to supply organic BSF farmers must themselves be organically reared, then the legal requirement for the gene stock to be reared on organic feed places an onerous burden on genetics companies. It seems prescient that Reg (EU) 2018/848 includes the clause that enables the Commission to extend relaxations and exemptions concerning the use of non-organic protein feed for feeding organic poultry and porcine animals, five years after the date of application of this Regulation. The underlying reason for the clause is their acknowledgment that such material may not be available in organic form on the EU market and that the Commission may need to take account of possible limited access of organic operators to such material. If potential future supply issues with regard to organic feed for relatively well-established organic species and systems is already predicted, then the supply of organic feed for insects may well face the same bottleneck.

Response: the SC agreed to leave 7.3 as it was. The SC decided to limit the regional exception only for regionality (thereby deleting “other exception”).

Comment Annabel Schuhn, Naturland

From the Naturland perspective and research about available organic waste for insect feeding, it is not feasible to feed 100% organic material. The quantity is currently not

available especially if sourcing only locally. The fundamental idea behind insect breeding is to make a win situation out of the ability of insects to convert low-value agro-industrial co-products into high quality animal proteins and reintroduce them in the food chain. This makes only sense if regional by-products are sourced from agriculture that would otherwise go to waste. Additionally, the production of feed for direct consumption should be avoided if it competes with food for human consumption (e. g. cereals, soya, vegetables etc.). Also talking about carbon footprint and regionality it is important not to source organic feed material from all over the world but to create criteria to conventional waste in case no organic feed is available in the region.

Response: the SC agreed to leave 7.3 as it was. The box below requirement 7.3.3 foresees a regional exception in case organic feed is not locally available in sufficient quantity or quality.

Comment IPIFF (International Platform of Insects for Food and Feed)

While the properties of the insect substrates used in the EU are – technically – in line with the standards for animal feed (e.g. no traces of hazardous chemicals), it remains logistically impossible to source 100% of the insect substrates from organic sources. This would be a major bottleneck for both insect farming sectors (food and feed). ‘...requiring insect producers to source 100% of their substrates/feed on the organic market, the legislator will largely hinder the possibility for actors producing insects as feed to uptake these new organic rules. We would therefore like to propose some adaptations to the draft text so as to overcome this challenge’.

Source: [https://ipiff.org/wp-](https://ipiff.org/wp-content/uploads/2019/03/IPIFF_Contribution_Paper_on_EU_organic_certification_of_insect_production_activities_29-03-2019.pdf)

[content/uploads/2019/03/IPIFF_Contribution_Paper_on_EU_organic_certification_of_insect_production_activities_29-03-2019.pdf](https://ipiff.org/wp-content/uploads/2019/03/IPIFF_Contribution_Paper_on_EU_organic_certification_of_insect_production_activities_29-03-2019.pdf).

On the other hand, a derogatory regime for the substrate used in organic insect farming would, in turn, contribute to upscaling organic animal farming (e.g. more organically certified products available – including insects), as well as organic food production (e.g. more diverse organic food products – including insects).

Last but not least, such an adaption in the legislation would also be in the benefit of organic crop farmers, who could rely on ‘insect frass’ in their fertilization practices (e.g. higher quantities produced if the 100% substrate requirement is not adopted).

Response: Organic feed is a fundamental principle of organic production, therefore the SC decided to leave 7.3 as it is. Substrate is also feed. Substrate that is not feed is regulated under 7.1.6.

The box below requirement 7.3.3 foresees a regional exception in case organic feed is not locally available in sufficient quantity or quality.

7.3.1. Organic invertebrates shall be fed organic feed unless the radius of movement of the species is such that the individuals collected can be assured to have foraged on the organic land or on land that has not been treated or contaminated by prohibited substances (cf. 7.1.16).

Comment AFFIA

Wild harvested insects shall not have the possibility for organic certification, in line with the recognized pressure on biological systems and the lack of quality and safety control. Specific traceability requirements may be defined to prove proper practices. 1B Despite the apparent technical feasibility to ensure 100% organic inputs which appears achievable, we would like to express our concern on the economic feasibility.

Response: the standard is on “production of terrestrial invertebrates”, not wild harvested insects. The SC agreed to replace the requirement with: *Organic invertebrates shall be fed organic feed unless the radius of movement of the species is such that the individuals collected can be assured to have or forage on organic land or on land that has not been treated or contaminated by prohibited substances (cf. 7.1.16).*

Comment Gonçalo J. Costa, founder of The Cricket Farming CO

I would argue that crickets farmed in egg cartons or any single-use paper-based product would nibble on those, voiding the proposed 100% organic feed rate. If 100% organic feed should go to cricket farming, what other options could be instead used?

Response: The SC considers nibbling as not being the same as feed. We address the comment in 7.1.6 a and b. In 7.1.6 a : “a. materials or substances consumed by the invertebrates ~~(even in small quantities)~~ shall meet the invertebrate nutrition requirements in section 7.3”.

In 7.1.6b “materials or substances that are regularly disposed of (such as substrate) shall be composed of substances allowed in Appendix 2 of this standard and may also be paper/wood products not containing contaminants such as toxic glues or glossy, coloured inks, synthetic fungicide, preservative, fumigant, or nanomaterials”.

Comment from Andrew Richardson, Aqua Nutrition Manager

1. Availability of organic bi products, required to feed insects are not sufficient to fulfill the needs of the insect industry. Most insects feed on agricultural bi-products such as wheat solubles, wheat bran, horticultural bi-products, and spent grains from breweries. According to these two works (« Un ancrage dans les territoires et une croissance soutenue » and « Gisements et valorisations des coproduits des industries agroalimentaires » - please find attached to email) there are 1800kT of such bi-products available in France, of which 75kt are organic certified (~4%). One serious vertical farming player alone utilizes on one site up to 300kt of such bi-products every year (figure taken from Innova Feed’s Nesle site). 2. Locality as a key element of the sustainable proposition of insects, transport of organic co-products alone is destructive to the eco-centric nature of the industry. This is especially true if that freight is happening across national borders. Indeed 7.3.1. of this standard is in conflict with 7.3.4 of the same standard. 3. The advent of vertical insect farming as an

impactful modern farming practice has the potential to dramatically reduce pressure on terrestrial and marine resources, as well as supply low carbon alternatives to many traditional protein, oil, and fertilizer products. In this way the insect industry is naturally aligned with that of the organic standard, but the requirement for 100% organic feedstock collapses the opportunity to utilize this potential.

Response: Organic feed is a fundamental principle of organic production, therefore the SC decided to leave 7.3 as it is.

The box below requirement 7.3.3 foresees a regional exception in case organic feed is not locally available in sufficient quantity or quality.

Comment Horison Insects

We cannot imagine a scenario where insects are raised outdoors. Furthermore, forcing 100% organic feed will be extremely detrimental to the environmental gains. Environmental gains come from feeding the insects surplus vegetables, former-foodstuffs, agricultural waste. Can acceptable limits of conventional feed be defined? Furthermore, there should be a difference made between the feed given to the beetles (which are not eaten) and the feed given to the larvae, which are the finished product.

The same could be applied to cricket farming, where some adults are only kept as breeders (i.e. only the eggs are used to produce offspring for sale/processing).

Response: Organic feed is a fundamental principle of organic production, therefore the SC decided to leave 7.3 as it is.

The box below requirement 7.3.3 foresees a regional exception in case organic feed is not locally available in sufficient quantity or quality.

Comment Silvia Cappellozza, Researcher, CREA-AA

In my opinion it is possible insects need diet integration with minerals or vitamins, in case their diet, due to the indoor conditions, is less various than into the wild. For this reason, I would be more tolerant than 100%. I think 75% is more affordable, although 100% organic could be reached in principle.

Response: The SC agrees that integration of the diet with minerals, vitamins and other supplements may be permitted. Requirement 7.3.1 is modified as follows: "Organic invertebrates shall be fed organic feed unless the radius of movement of the species is such that the individuals collected can be assured to have foraged on the organic land or on land that has not been treated or contaminated by prohibited substances (cf. 7.1.16).

Organic invertebrates may be fed with vitamins, trace elements and supplements only from natural sources" .

7.3.2. Invertebrates intended only for animal feed may be fed with slaughter waste and excrements (e.g. manure), provided that those come from organic animals

Comment Annabel Schuhn, Naturland

In regulation 2017/893 appendix II only following products are allowed see list. Manure is forbidden for feeding insects. (list provided in the Naturland comment)

Response: the SC agrees that the requirements contradicts safety requirements included in the EU Regulation and the IFOAM Norms (e.g. on animal husbandry). Requirement 7.3.2 is removed, as well as 7.3.5b, following the same reasoning.

Comment IPIFF (International Platform of Insects for Food and Feed)

In the EU, this possibility is not legal. (refers to slaughter waste and excrements)

Response: the SC agrees that the requirements contradicts safety requirements included in the EU Regulation and the IFOAM Norms (e.g. on animal husbandry). Requirement 7.3.2 is removed, as well as 7.3.5b, following the same reasoning.

Comment from University of Copenhagen, Department of Nutrition, Exercise and Sports

The current EU legislation do not allow the use of slaughter waste or manure to feed insects intended for any entry into the food chain (feeding production animal or human food). Feed for pets or fur animals should be OK, but I assume this not the scope for the organic standards. I suggest to let the organic standards be based on that insects are fed only the type of foodstuff which is generally allowed, and add the organic origin on top of it.

Response: the SC agrees that the requirements contradicts safety requirements included in the EU Regulation and the IFOAM Norms (e.g. on animal husbandry). Requirement 7.3.2 is removed, as well as 7.3.5b, following the same reasoning.

7.3.3. The invertebrates shall be offered a diet that provides all of the nutritional needs of the animals at the various stages of their development, in a form allowing them to exhibit their natural feeding and digestive behavior.

Comment IPIFF (International Platform of Insects for Food and Feed)

Due to the insufficient availability of organic inputs, relying on 100% organically certified substrates in insect farming might pose serious challenges for the insect larvae growth and development.

Response: the SC agreed to add in requirement 7.3.1: *Organic invertebrates shall be fed organic feed or forage on organic land or on land that has not been treated or contaminated by prohibited substances (cf. 7.1.16).*

Organic invertebrates may be fed with vitamins, trace elements and supplements only from natural sources.

7.3.4 The feed shall predominantly come from regional sources.

Comment Gymneat Crickets

I would omit this section (allow free-market sources to reign on this one. What are you defining as a "regional source"?). Additionally, the BEST quality feed should be the goal, not the restriction on sourcing due to something as arbitrary as geography. If animal welfare is paramount, you shouldn't have to jump through additional regulatory hoops (i.e. be granted an exception) in order to do what's best for your animals.

Response: The SC agreed on keeping the regional exception: Exceptions may be permitted if the operator can demonstrate that the feed is not available locally in sufficient quantity or quality.

There is no definition of "regional" since the IFOAM Standard is a global one, and the definition of regional might differ in different world regions.

Comment from Florian Berendt, Agricultural engineer, EntoSus GmbH

Regional must be defined (30km?)/ The feed and substrate are to be used according to the following list of priorities:

- a. organic by-products and residual materials;
- b. conventional by-products and residual materials;
- c. organic feed;
- d. conventional feed.

If organic byproducts and residual materials from food and feed production are not available in the area of the insect production conventional byproducts and residual materials from food production should be used preferred to organically grown feed that has to be transported into the area of insect production. The use of conventional by products and residual materials must be reported to the control body. Proof of regular analysis before use has to be submitted as part of the application procedure to show that using this feed is harmless (with respect to pesticides, mycotoxins, heavy metals, antibiotics, GMOs etc.). A corresponding analyses interval has to be agreed upon with the control body, depending on the substrate used.

Response: The SC agreed on keeping the regional exception: Exceptions may be permitted if the operator can demonstrate that the feed is not available locally in sufficient quantity or quality.

There is no definition of "regional" since the IFOAM Standard is a global one, and the definition of regional might differ in different world regions.

Comment AFFIA

This appears as a loophole as presented and requires further precisions regarding "regional" and exceptions

Response: The SC agreed on keeping the regional exception: Exceptions may be permitted if the operator can demonstrate that the feed is not available locally in sufficient quantity or quality.

There is no definition of “regional” since the IFOAM Standard is a global one, and the definition of regional might differ in different world regions.

Comment Annabel Schuhn, Naturland

What is meant with regional? Are there any distances set?

Response: The SC agreed on keeping the regional exception: Exceptions may be permitted if the operator can demonstrate that the feed is not available locally in sufficient quantity or quality.

There is no definition of “regional” since the IFOAM Standard is a global one, and the definition of regional might differ in different world regions.

Gymneat Crickets

Exceptions may be permitted if the operator can demonstrate that the feed is not available locally in sufficient quantity or quality.

Response: The SC agreed on keeping the regional exception: Exceptions may be permitted if the operator can demonstrate that the feed is not available locally in sufficient quantity or quality.

7.3.5. The following feed and feed ingredients are prohibited: a. Invertebrates or invertebrate by-products of the same species offered as a component of the feed regime;

Comment from Horison Insects

Again, here I would refer you back to the EFSA annex which specifies allowed feed for edible insects

Response: the operator should refer to regional legislations, since the IFOAM Standard is a global standard it will not refer to specific regional requirements. The requirement 7.3.2 on slaughter waste and manure was deleted.

7.3.6. Additives and processing aids listed in Appendix 4, Table 1 of this standard are permitted.

Comment Silvia Cappellozza, Researcher, CREA-AA

I suggest to add hypochlorous acid that is similar to sodium hypochlorite, according to the EGTOP/2016 Final Report on cleaning and disinfection: “For the moment, the Group recommends that the listing of sodium hypochlorite in Annex VII remains

unchanged. Calcium hypochlorite and mixtures of potassium peroxomonosulphate and sodium chloride producing hypochlorous acid should be authorized for all uses for which sodium hypochlorite is authorized”

Response: substances are part of the Appendixes in the IFOAM Norms. The revision of the appendix of permitted substances is not under discussion at the moment.

7.3.7. Invertebrates intended for human consumption need to be fed feed grade materials. The last feeding must be food grade materials unless the guts are empty through fasting prior to the time of killing.

Comment from Florian Berendt, Agricultural engineer, EntoSus GmbH

Why food grade? Chickens, Cows...are only fed with feed grade as well so feed grade is enough...

Response: insects may be consumed entirely (also guts). This relates to food safety, not to organic integrity of products. Local safety legislations would cover it. The SC agreed on deleting 7.3.7

Comment AFFIA

The definition of food and feed grade may be required and the same grade may apply to the whole lifecycle.

Response: This relates to food safety, not to organic integrity of products. Local safety legislations would cover it. The SC agreed on deleting 7.3.7

Comment Annabel Schuhn, Naturland

This is unreasonable, because food grade competes with food for human consumption! See explanation 7.3 Starvation for insects is not applicable because cannibalism is increasing and insects will feed on the structure material.

Response: This relates to food safety, not to organic integrity of products. Local safety legislations would cover it. The SC agreed on deleting 7.3.7

Comment IPIFF (International Platform of Insects for Food and Feed)

For the requirement of feeding food grade materials as the last feeding of insects intended for food, I suggest the feeding of insects for human food should also follow general standards for food safety: Feed grades materials already have safety standards, and on top there are general food safety standards for the insect as a food product. In addition, there will be specific safety specifications for the insects as they get approved by EFSA under Novel Food (first dossier was finally approved this month, for dried mealworms, and more are expected to follow this year). Adding the requirement of use of food grade feeding is in my view unnecessary for a safety perspective, and no guarantee of safety anyway. These comments are intended to

support that the organic specifications are as implementable as possible, to encourage as many producers as possible to produce organic. I believe it will not compromise the organic principles to remove these requirements.

Response: This relates to food safety, not to organic integrity of products. Local safety legislations would cover it. The SC agreed on deleting 7.3.7

Comment North American Coalition for Insect Agriculture (NACIA)

Add to it: 7.3.8. The untreated frass from invertebrates fed (organic or non-organic) food waste, food or animal feed processing by-products, inputs that are unusable in traditional animal protein production, and non-manures is suitable for application on organic crops, provided

- a. It is applied at least 90 days prior to harvest for crops whose edible portions do not come in contact with the soil and at least 120 days prior to harvest of crops whose edible portions do come in contact with the soil, or
- b. It is demonstrated that there are less than 3 MPN of Salmonella and E. coli per 4-gram sample of untreated frass, or
- c. the processing requirements outlined in section 7.4 are satisfied.

It is our view that the use of frass is an important aspect of insect farming which is in alignment with your organization's vision for organic agriculture. Organic agriculture is based on the ideal that growing food, feed and fiber should be practiced in the most sustainable way. When Northbourne coined the term "organic farming" in 1940, the general consensus of organic was to look at farming as a system, or "organism" (Paull, 2011). Growers and researchers looked to manure and cover crops as the staple source of fertility for growing crops, differing from the trend of using energy intensive synthetic fertilizer in the early 1900's (Phillip, 2001). Organic agriculture is rooted in capturing lost nutrients and incorporating them back into the system. Many insect producer's missions are to strive for this same ideal – to provide growers a sustainable fertilizer that incorporates lost nutrients back into the system.

Response: the SC believes that this addition belongs to food safety standards and does not belong here as outside of the scope of the IFOAM Standard.

Comment North American Coalition for Insect Agriculture (NACIA)

Add: 7.4 Processing of Insect Manures

Processing of insect manure intended for use less than 90 days prior to harvest for crops whose edible portions do not come in contact with the soil and at least 120 days prior to harvest of crops whose edible portions do come in contact with the soil follows guidelines equivalent to the use of animal manure, which include these approaches:

- a. Pasteurization. Processed manure products must be treated so that all portions of the product, without causing combustion, reach a minimum temperature of either

150°F (66°C) for at least one hour or 165°F (74°C), and are dried to a maximum moisture level of 12%;

b. Composting or vermicomposting in accordance with NOP 5021.

c. Equivalent process. An equivalent heating and drying process or composting could be used. In determining the acceptability of an equivalent process, processed frass products should not contain more than 3 MPN (Most Probable Number) Salmonella or E. coli per 4-gram sample of processed frass.

Response: the SC believes that this addition does not belong here as outside of the scope of the IFOAM Standard.

Additional comment NACIA:

The three most commonly farmed insects are crickets, black soldier fly larvae and mealworm. The following provides species specific information regarding their ability to recycle nutrients efficiently and reduce the risk of harm due to contaminants. The references for this section are also attached.

Black Soldier Fly Larvae:

The Black Soldier Fly Larvae (BSFL) was identified over a decade ago as an ideal processor of food waste. This food waste would normally be sent to landfills, increasing waste and emissions. Every year, the United States wastes 133 billion pounds of food, equal to \$161 billion per year (USDA, 2015). BSFL can be fed a controlled diet of pre-consumer, federally inspected food waste. The larvae are harvested as a sustainable protein source for fish and pets. The manure, or frass of the BSFL, is collected and processed into a commercial frass product. By removing excess food waste that would go to landfills, producers are reducing the carbon footprint of grocers, food retailers and cities. BSFL are known for their pasteurizing bioconversion process by consuming and defecating feedstock. BSFL often consume and re-consume the same feedstock material multiple times, enhancing the bioconversion process of feedstock into fertilizer. In a 2017 trial, BSFL fed aflatoxin inoculated feedstock (AFM1) were found to contain below detectable limits of the aflatoxin AFM1 (Bosch, 2017). As well, BSFL fed a raw sewage diet had a 6 log₁₀ reduction in Salmonella spp. in human faeces in eight days, compared with a < 2 log₁₀ reduction in the control (Vinneras, 2014). BSFL are ideal processors of food waste and can drastically reduce contaminants found in feedstock. Furthermore, a study completed at the University of Saskatchewan showed BSFL fed wheat infected with Fusarium were found to have near negligible amounts of Fusarium (DON), and BSFL did not accumulate Fusarium (Kutcher, 2019). A study completed at Kwantlen Polytechnic University in Langley, BC also ran a trial which fed Fusarium oxysporum and Rhizoctonia solani infected grain to BSFL. The researchers noted the frass of the BSFL contained no detectable trace of either Fusarium oxysporum or Rhizoctonia solani (Henderson, 2019). The researchers hypothesized the BSFL may be able to metabolize the pathogenic fungi (Henderson, 2019). BSFL may be able to metabolize potentially harmful substances in the feedstock

Crickets:

Cricket is the common name for insects in the superfamily Grylloidea. Various species of crickets are now farmed, such as Acheta domesticus, Gryllodes sigillatus and Gryllus bimaculatus. Their natural diets vary by species but when captured will eat a variety

of organic material, and they thrive best when the nutritional balance is appropriate for that species (Huber 1989). The diet of farmed crickets usually consists of grains, vegetables and/or legumes.

As a pet and human food ingredient, crickets offer more sustainable protein than the conventional animal options. For the human diet, the amino acid profile is complete. As with other farmed insects, cricket frass is critically poised to be a natural option for soil amendment and plant growth enhancer. Cricket frass has been found to improve corn yields and increase soil nitrate (Darby 2017).

The Yellow Mealworm:

The Yellow Mealworm (*Tenebrio molitor*) is so called because it has evolved to feed on stored grains and has been domesticated for decades as exotic animal food. This dry-adapted beetle is able to derive all the water it needs from its environment. With its simple lifecycle and dietary requirements, the mealworm is particularly well-suited to large scale production as a sustainable protein source and feed ingredient.

The mealworm recovers nutrients from industrial grain by-products and organic wastes. Its incredible digestive powers allow it to eat a range of organic ingredients from underutilized and low value feedstocks from canola meal to dried distiller's grains. Mealworms are able to naturally eliminate mycotoxins and have been shown not to bioaccumulate DON, ZEN, or aflatoxin. Mycotoxin contamination level in the mealworm diet does not impact mealworm feeding or performance.

As a feed ingredient, the mealworm shows significant promise to reduce reliance on fishmeal and other less sustainable protein feed ingredients. Its amino acid profile is comparable to soybean meal and fishmeal and are a preferred insect for replacing fishmeal (Riddick 2013) able to make up to 80% of fish diets (Ng 2001).

This insect can be grown year-round, anywhere in the world, localizing food and feed supply chains, reducing environmental impacts associated with shipping and protecting the feedstock from impacts of weather and climate change, with an overall impact of stabilizing the food supply.

Response: the SC believes that this addition does not require any action point for the SC.