EUROGROUP FOR ANIMALS

Insect farming: a false solution for the EU's food system

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Introduction

The Farm to Fork strategy aims to create a shift in European consumption patterns towards more plant-based food. It recognises the link between health and diets and the severe climate and environmental impacts of intensive animal farming for meat. The strategy also emphasises the connection between farmed animal welfare, human health and the ecosystem. It aims, therefore, to create a truly sustainable food system that moves away from industrial intensive animal farming.

Whereas the increased use of insects to enrich animal feed is touted as a more sustainable option than other protein-enriched solutions, promoting insect production will hinder progress towards a sustainable food system by locking the EU into intensive animal farming.

The insect farming industry is energy intensive and, consequently, a potential contributor to climate change. Moreover, there is little information, currently, on what environmental impacts or impacts on the ecosystem the rearing of large quantities of insects could have in Europe.

To reach its objectives - as laid out in the Farm to Fork strategy - the EU should take a twofold approach.

1. Promote a dietary shift towards more plant-based food.
2. Reduce the number of animals that are intensively farmed.

Industrial animal farming for food should be replaced rather than adding insect protein as another form of industrial farming.

Moreover, the precautionary principle should apply in decision-making on industrial insect farming. Further EU regulatory approvals need to be anchored in solid scientific evidence on the insect farming industry's environmental impacts, energy consumption, climate change and ecosystem impacts.

Eurogroup for Animals has identified four areas of concern that require careful consideration before industrial insect farming can be upscaled.

1. Industrial insect farming for livestock feed can be an obstacle to achieving the objectives of the Farm to Fork Strategy: boosting factory farming instead of promoting a sustainable food system.

2. Insect farming can be energy intensive and have a high climate & environmental impact

3. Insect farming for feed and food may have consequences on ecosystems

4. Lack of scientific knowledge about insect welfare

1. Industrial insect farming for livestock feed can be an obstacle to achieving the objectives of the Farm to Fork Strategy: boosting factory farming instead of promoting a sustainable food system.

Promoting large-scale insect farming for feeding livestock will sustain intensive animal production models instead of facilitating the transition to a sustainable food system as envisaged by the European Green Deal.

Insect-derived protein as animal feed is increasingly presented as a solution to diminish the use of imported soy and other feed crops linked to deforestation, as well as replacing the use of fishmeal from depleted oceans.

The Farm to Fork strategy aims to "reduce the dependency on critical feed materials such as soy grown on deforested land by fostering EU-grown plant proteins as well as alternative feed materials" and mentions insects as an example. Moreover, the use of insect protein as feed is also viewed as contributing to circular economy supply chains by feeding insects on organic waste.

However, a sustainable food system should focus on reducing the amount of animal products and supplying them from systems with higher welfare standards. Animal consumption patterns, therefore, should shift primarily to plant-based diets.

State of play: Seven insect species authorised for processed feed in the EU (Insect PAP)

- Black soldier fly (Hermetia illucens)
- Common housefly (Musca domestica)
- Yellow mealworm (Tenebrio molitor)
- Lesser mealworm (Alphitobius diaperinus)
- House cricket (Acheta domesticus)
- Banded cricket (Gryllodes sigillatus)
- Field cricket (Gryllus assimilis)

Boosting insect farming for animal feed will sustain factory farming with its serious animal welfare concerns. Indeed, the European Commission's Agricultural Outlook forecasts that the increased supply of insect meal and lower prices could support conventional intensive animal production if the practice is fully commercialised and existing restrictions lifted.

Life Cycle Analyses (LCA) show that insect farming is energy intensive and uses more land than generally assumed. A study in Norway of insect based feed under commercial production of yellow mealworms and black soldier flies using locally available side-streams and waste resources found that the black soldier fly meal has the highest environmental impacts above soybean meal and rapeseed meal.

Black soldier fly oil and yellow mealworm production emits 20% and 191% more CO2 respectively than soybean oil production. Black soldier fly meal production produces 191% more CO2 than soybean meal. Whereas black soldier fly oil has a slightly lower energy use than soybean production, yellow mealworm oil is almost 4 times higher. Black soldier fly meal production has an energy use that is 20 times higher than soybean meal's.

Environmental impact of insect farming compared to soybean and rapeseed meal.

		Soybean oil		Soybean meal	
Category	*Unit*	*Black Soldier Fly*	*Yellow Mealworm*	*Black Soldier Fly*	*Rapeseed*
Climate Change	Kg CO_2 eq	*+20%*	*+191%*	*+191%*	*-63%*
Energy use	MJ	*-8%*	*+268%*	*+2070%*	*-25%*

Source: Liverød, Tonje. Life cycle assessment of insect production based on Norwegian resources. 2019.

A LCA study in France of locally produced mealworm had similar results, finding higher energy use, CO2, eutrophication and land use compared to soybean imported from Brazil and fishmeal from Peru.

Insects already on the EU food market

The first novel food application for placing the yellow mealworm on the human food market was approved by the EU in May 2021. At the moment, 11 applications for insects are subject to safety evaluation by the European Food Safety Authority (EFSA).

But… although promoted for their high protein content, lower greenhouse gas emissions, less land and water use and low Feed Conversion Ratio (FCR) compared to conventional livestock, insect FCR efficiency depends on factors such as species, feed quality, or life stage.

When fed on by-products, mealworm and crickets have a feed conversion rate of 2.3, which is about the same as chicken when consumed directly by humans.

As for the quality of the feed, house crickets fed on the same feed as poultry or on high-quality processed waste have been found to grow well with a protein conversion ratio similar to that of chickens. However, when fed minimally processed lower-quality food waste and straw the mortality rate is above 99% and they do not reach the full size for slaughter.

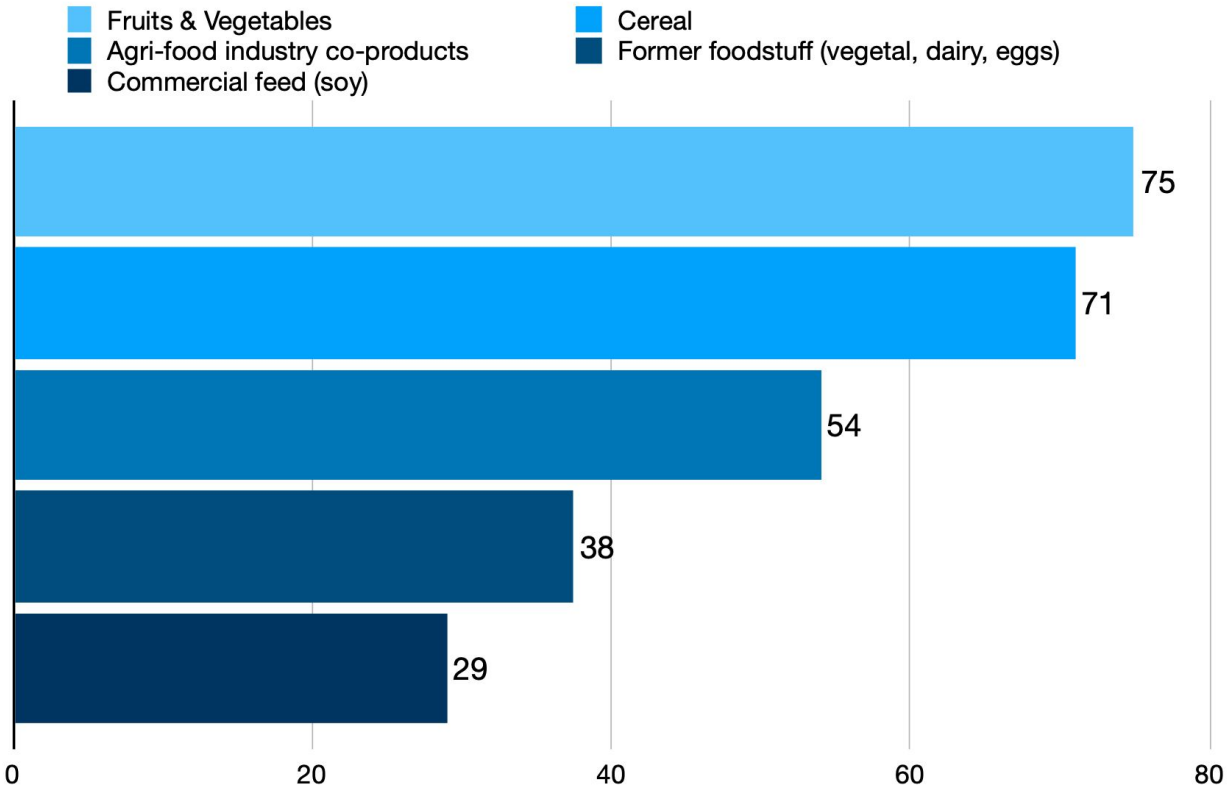
As a food source for humans, mealworms produce less greenhouse gases and use less land. However, energy use is higher than for milk or chicken production and similar to pork and beef as they require a thermal comfort temperature of 20-30°C to thrive.

Insect protein in feed can exacerbate the food-feed competition

Insect protein is touted as an alternative feed that requires less land use. However, this case can only be made if the insects are fed on by-products. In practice, most EU producers do not rely on food wastes to feed their insects.

According to the industry association IPIFF, producers use a mixture of different ingredients. Of these, former foodstuff is only employed by 37.5% of European insect producers, while more than half use "co-products from agrifood industries", and about three-quarters use fruits, vegetables, and cereal. These are resources that could be fed directly to chickens, pigs or for direct human consumption. Around a third of insect producers use commercial feed which includes soy.

Substrates used by insect producers (percentage -%- of producers using each substrate)



Source: IPIFF vision paper on the future of the insect sector - Survey of IPIFF members March 2018

Consequently, producing insects for animal feed still requires using arable land for crops that could otherwise be used for food for humans, exacerbating the competition for arable land between crops for feed and crops for food.

EU goals are not compatible with the intensification of insect farming

The EU's goal "to reduce the environmental and climate footprint of the EU food system" by ensuring that the food chain has a neutral or positive environmental impact may be incompatible with the generalisation and intensification of insect farming. In fact, the EFSA notes that the environmental impact of insect farming will be comparable to other forms of animal production.

Industrial insect farming's potential ecosystem impacts require caution

EFSA states that there is as yet little information on the environmental impact of the various intensive insect production systems. Large scale insect farming may have consequences for local ecosystems, threaten food security and biodiversity.

50 trillion industrially farmed insects by 2030

The International Platform of Insects for Food and Feed (IPIFF) predicts that Europe's insect protein production will grow from 6.000 tonnes in 2019 to three million tonnes in 2030. In this scenario, an estimated 50 trillion insects would be industrially raised annually in Europe.

With climate change and the increase of extreme weather events, there is a greater risk of accidental mass-releases from insect farms leading to the introduction of invasive alien species. The economic consequences could be signifi-

-cant, considering that invasive species are the cause of a 14% reduction in global food production.

Moreover, the changing climate increases the capacity of invasive alien species to establish. An increased risk of insect-borne pathogens would pose an additional threat to already struggling wild-living insects that are essential for the ecosystem, such as pollinators. Beyond the economic impact, the impact on local ecosystems would compromise both biodiversity and food security.

Environmental impacts of industrial insect farming should be evaluated against plant-based protein production

The production of insect protein has a higher environmental impact than humans consuming plant-based protein. To align with the objectives of the Farm to Fork Strategy, the environmental impacts of insect farming for food should not be evaluated in comparison to conventional animal farming. Rather they should be compared to the production of plant-based protein for direct human consumption and to other protein alternatives such as cultivated animal products.

3. Insect farming for feed and food may have consequences on ecosystems

The Farm to Fork strategy identifies the acute interrelations between human health, ecosystems, supply chains, consumption patterns and planetary boundaries. Industrial insect farming also has the potential to foster disease and affect the ecosystem.

Industrial insect farms are at risk of rapid pathogen spread among the farmed insects. Moreover, there is a risk of viruses being introduced into the industrial farms through the

Debunking myths: Insect protein in pet food does not replace meat otherwise sold for human consumption.

Insect protein is promoted as a more sustainable alternative on the pet food market. However, conventional pet food production sources meat production by-products that are not processed into human edible food. Insect protein in pet food, therefore, does not replace meat that would otherwise have been sold for human consumption.

substrate, for example through the waste used for the rearing of the insects and the bioaccumulation of a number of heavy metals and hazardous chemical elements. Where this occurs antibiotics are required, raising further risk of antimicrobial resistance developing in microorganisms.

The industry claims that antibiotics are not used in insect farming, however, as no other medical treatment exists, where disease develops the only option is killing the entire farm's insect population.

The Farm to Fork Strategy: adopting the One Health-One Welfare approach

As highlighted in the Farm to Fork strategy, it is necessary to recognise the interlink between animal health and human health and how they are connected to the ecosystem in which they exist, known as the One Health approach. Furthermore, animal welfare improvements also have value for humans. For example, improved animal welfare reduces their exposure to disease and, consequently, the need for antibiotics. This, in turn, reduces risk of antimicrobial resistance (AMR) in humans. This interlink between animal welfare, human well-being and sustainability is known as One Welfare.

Taking a One Health-One Welfare approach, recognising the interdependence of both health and welfare, linking animal welfare improvements to human health and sustainability, industrial insect farming raises two significant concerns:

1. scaling up industrial insect farming for feed will sustain factory farming of animals and work against EU goals of improving food quality for Europeans and animal welfare;
2. mass production of insects for the EU food system can have serious consequences on the ecosystem.

Greater scientific evidence on industrial insect farming risks is required. The Farm to Fork strategy is an opportunity for the EU to consider the food system as a whole and avoid past mistakes with other species over welfare requirements and the potential consequences for the ecosystems.

4. Lack of scientific knowledge about insect welfare

Animal welfare considerations are not included in the food safety assessments made by EFSA or in the EFSA risk profile related to the production and consumption of insects as food and feed. However, according to ESFA the "general animal (vertebrate) health and welfare rules should also apply for insects". Nevertheless, there is currently a lack of scientific knowledge about the welfare needs of insects, as well as about their experien-

-ces of suffering and pain.

Of an estimated 5.5 million insect species, with different needs and characteristics, only 1 million species are named. Of the about 2.000 known edible insect species, the welfare requirements of each would need to be examined for housing systems to meet environmental and species-specific needs.

Incoherent EU legislation

Insects bred for the production of processed animal protein are considered farmed animals by EU regulations (1069/2009). However, Council Directive (98/58/EC) concerning the protection of animals kept for farming purposes excludes invertebrates.

The insect farming industry recognises its limited knowledge, stating "the current lack of scientific evidence around invertebrate welfare makes it very difficult to develop science-based welfare rules for insect production". This means that the development of housing systems and rearing methods is based on trial-and-error. Industry is highly secretive about the systems and technologies used and veterinary specialisation in insects is lacking which makes it difficult to inspect insect farms.

Particular attention must be paid to the slaughter process as there may be differences in sentience between the larvae and the grown insects, but knowledge is still lacking. In the absence of scientific evidence, the precautionary principle should be applied.

Only recently was it scientifically established that fish feel pain. However, over the years intensive aquaculture practices and slaughter methods led to animal welfare problems. With past experience in mind, the same mistakes can be avoided with insect farming. These systems that cause considerable suffering, pain and stress are difficult to reverse once established.

Expansion of insect farming should not be authorised as long as knowledge about welfare needs, slaughter methods and veterinary approaches of the different insect species is lacking.

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EUROGROUP FOR ANIMALS

Eurogroup for Animals
Rue Ducale 29 – 1000 Brussels
Tel: +32 (0)2 740 08 20

info@eurogroupforanimals.org
eurogroupforanimals.org