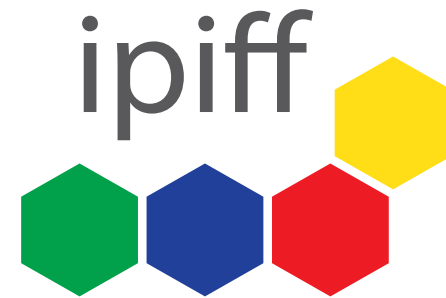




Photo: Micronutris (Agronutris company)



IPIFF perspectives on the evolution of the European insect sector towards 2030: current EU regulatory status, existing opportunities and prospects for development

Introduction

This brochure illustrates a list of policy priorities of relevance for the European insect sector. Developed by the IPIFF Secretariat with the support of the IPIFF members, we wish to highlight elements which—in our view—would be instrumental in materialising the transition towards more sustainable and resilient food systems, in line with the ‘EU Farm to Fork’ objectives and European Commission priorities outlined through the recent [Communication on ‘Safeguarding food security and reinforcing the resilience of food systems’](#) (23 March 2022). Several of these policy messages were presented in previously developed communication materials, incl. IPIFF Vision Paper (latest update November 2019) and the [IPIFF Regulatory Brochure](#) (May 2020).

Said documents offered a set of perspectives for the development of the EU insect sector in the next few years. Considering the recent headway made by European insect-producing companies (e.g. upscaling phase, gradual commercial penetration of its products), recent EU policy strides (e.g. authorisation of insect proteins in pig and poultry feed), and the ever-changing political and economic environment (i.e. COVID pandemic and the invasion of Ukraine, with the latter resulting in an energy crisis, disrupted supply chains and inflated prices), IPIFF’s members saw it appropriate to refresh our communication tools.

This brochure was developed with the goal to serve as a useful dossier of information for our stakeholders, notably policymakers, insect-producing companies, partners from the agri-food chain, and civil society. Topics herein include:

- General **state of development of the sector**, its future evolutions and main challenges (Chapter I);
- Achieved and ongoing major **policy milestones** for the European insect sector (Chapter II);
- Main **EU policy initiatives** and/or **frameworks** (e.g. Farm to Fork Strategy, EU Protein Policy Review, Common Agricultural Policy) IPIFF anchors its policy efforts on, **thereby maximising the contribution of our sector** (e.g. through its nutritional and sustainability credentials) in achieving the transition towards more sustainable and resilient food systems (Chapter III).



CHAPTER I: THE EUROPEAN INSECT SECTOR IS AT A TURNING POINT OF ITS HISTORY

1. The European insect-producing sector today

In the wake of recent **positive EU market openings** (i.e. insect proteins approval as feed in aquaculture in 2017, authorisation expanded to pig and poultry markets in 2021), European insect-producing companies have deployed ambitious plans with the view to increasing production capacity. Furthermore, the sector has set its mark to be commercially attractive: several insect businesses are supplying a wide range of markets with high-quality insect-enriched products. These are either intended for human consumption, animal feed (incl. pets and food producing animals) or as a fertilising product (insect frass).

From innovative biocontrol enterprises to food and feed pioneers, several industrial projects have emerged in Europe, making today the sector a **leader** in terms of **know-how** (e.g. knowledge on the biology of insects and breeding methods) and **industrial advancement** (e.g. development of tailored processing technologies and setting of automated or half automated systems).

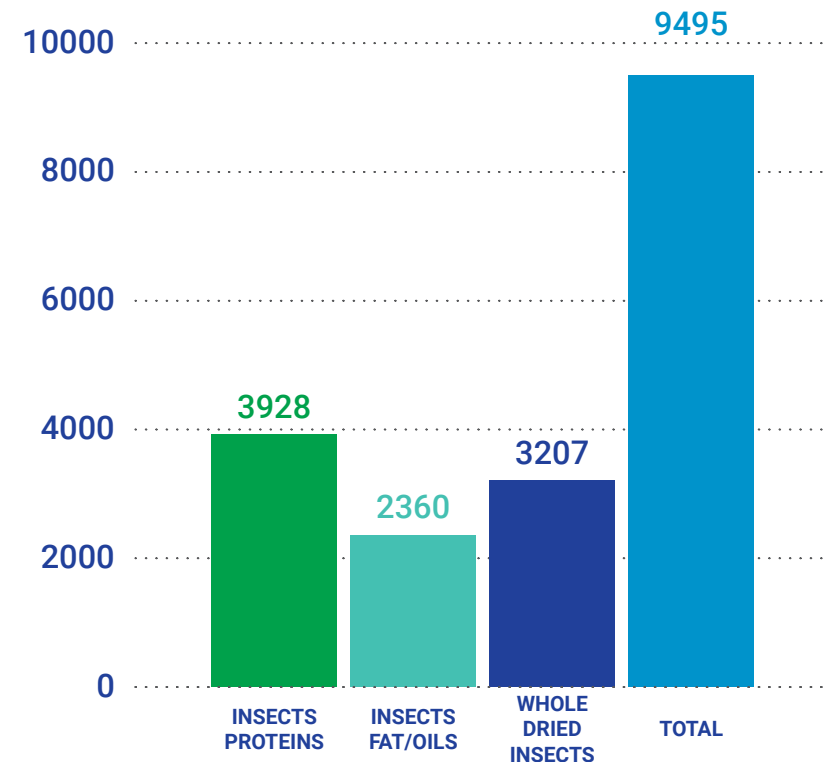
“The European insect sector has grown exponentially over the recent years and has now reached a critical threshold: today, several producers in Europe operate at >1,000 tonnes of insect biomass per annum.”

Adriana Casillas
IPIFF President

While **almost 10,000 tonnes of insect-derived feed ingredients were produced in 2022** (incl. whole dried larvae, insect proteins, and fats, intended either as feed for food-producing animals or for pets), production capacities are expected to grow exponentially in the next few years, according to the projections made by IPIFF’s Members (see section 2).

The overall support received by European insect-producing companies since their inception is a testament to the high-growth processes defining the current state of the industry. This has attracted investments of **more than 1,5 billion EUR** to date (IPIFF source).

2022—INSECTS FEED PRODUCTS (IN TONS)



(Source: IPIFF Questionnaire—February 2023)

An analysis of these projected figures indicates that the sector is therefore far from having reached its full potential: many companies are reaching a turning point in their development and in the deployment of their business activities. Numerous scale-up projects are currently underway, or are about to be deployed across European regions in the next one to three years.

- Several insect-producing facilities of a capacity **exceeding 10,000 tonnes** are operational and/or about to start **production**;
- Scale-up plans also materialise through **facilities expansion**.

“The insect sector is now building momentum in its endeavours to achieve the necessary economy of scale for insect-producing companies to drive final products prices down and increase the impact and competitiveness of the sector.”

Frank van Sluis

IPIFF 1st Vice President

Several projects were delayed or have been somewhat slowed down due to increased energy prices and construction materials costs, resulting

from the recent political and economic turmoil experienced at global level as a result of the COVID pandemic and the invasion of Ukraine by Russia.

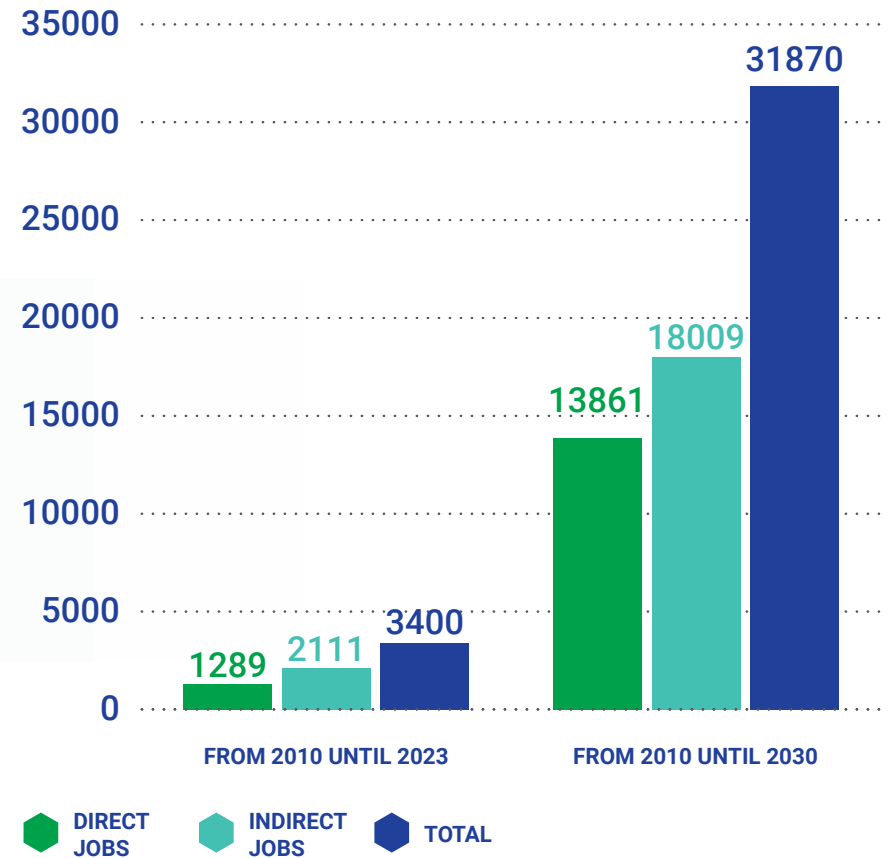
Alongside challenges of political or economic nature, some insect-producing companies also experience significant delays obtaining the necessary authorisations for building their facilities (e.g. delays in issuing building permits).

In spite of the aforementioned difficulties, the European insect sector **has generated considerable employment opportunities on the European territory (almost 3,500 jobs, including 1,000 direct jobs)**, have been created since the first insect producing companies were founded in 2010), thereby contributing to boosting the economies of these areas (e.g. peri-urban and rural areas).

Moreover, the sector has **diversified** over the recent years, with different **types of farms, operational sizes, business strategies** and/or **production models** emerging.

Notably, the following trends have been observed:

- **Specialisation of production operations:** Initially, the vast majority of insect farmers covered all life stages of the insect species they produced (so-called ‘full-liners’). In recent years, this has become differentiated with decentralisation of the production chain amongst a broad selection of companies that are now focusing only on certain production segments (e.g. breeding, processing, reproduction and delivery of neonates). Decentralised insect operation models have the advantage of de-risking the investment and operational complexity.



JOBS (I.E. DIRECT & INDIRECT JOBS) CREATED BY INSECT-PRODUCING COMPANIES SINCE THEIR INCEPTION AND FORECASTS FOR 2030

(Source: IPIFF Questionnaire—February 2023)

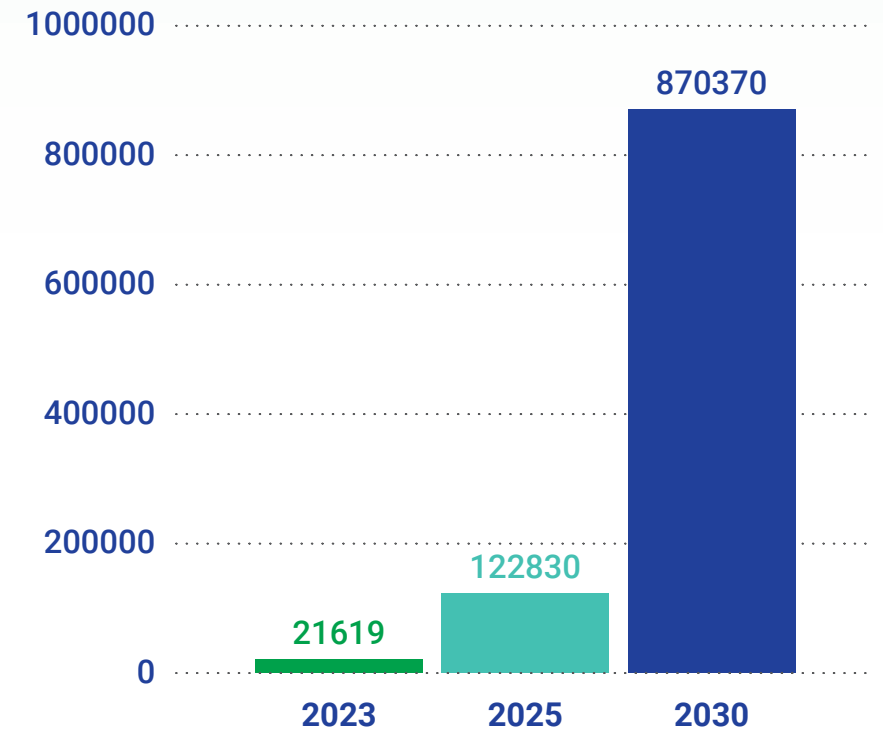
- **Higher level of integration with the food chain.** This trend is being mirrored by different business strategies, incl. the following:
 - The establishment of **local partnerships** between **producers and traditional ‘agri-food’ actors**: such partnerships can materialise through the upcycling of co-products generated by agri-food industries, which can then be reused as substrates for insects. In some other cases, the heat generated by these industries is being used for the breeding of insects (‘co-location model’). By mutualising the use of available resources, insect producing companies can reduce the operational costs of transport and further decrease their carbon footprint.
 - The development of **partnerships** between **insect producers** and **‘traditional’ livestock farmers**: such collaborations often materialise through the outsourcing of the breeding/fattening of farmed insects by local farmers. By exploiting the synergies between insect producers and traditional actors, such models allow both partners to benefit from substantial economic advantages whilst reducing their environmental footprint.

2. IPIFF forecasts until 2030

The recent evolutions experienced by European insect producing companies (see above section) are now shaping the future of the European insect sector. These will facilitate the conditions for said actors to offer **reliable solutions to traditional livestock producers and aquaculture producers**, while contributing to **addressing the current deficit in EU domestic protein production**, both for food and animal feed.

- One important forecast is that by the end of the decade, there will be a significant spike in the number of insect farms producing above 10,000 tonnes per annum, thereby developing large-scale operations;
- The number of European livestock farmers, who decide to diversify their commercial activities towards insect production, will also be increasing;
- According to IPIFF forecasts, the European insect-producing sector will generate approx. **870,000 tonnes** of insect feed ingredients by 2030.

EVOLUTION OF ALL INSECT-DERIVED FEED PRODUCTS



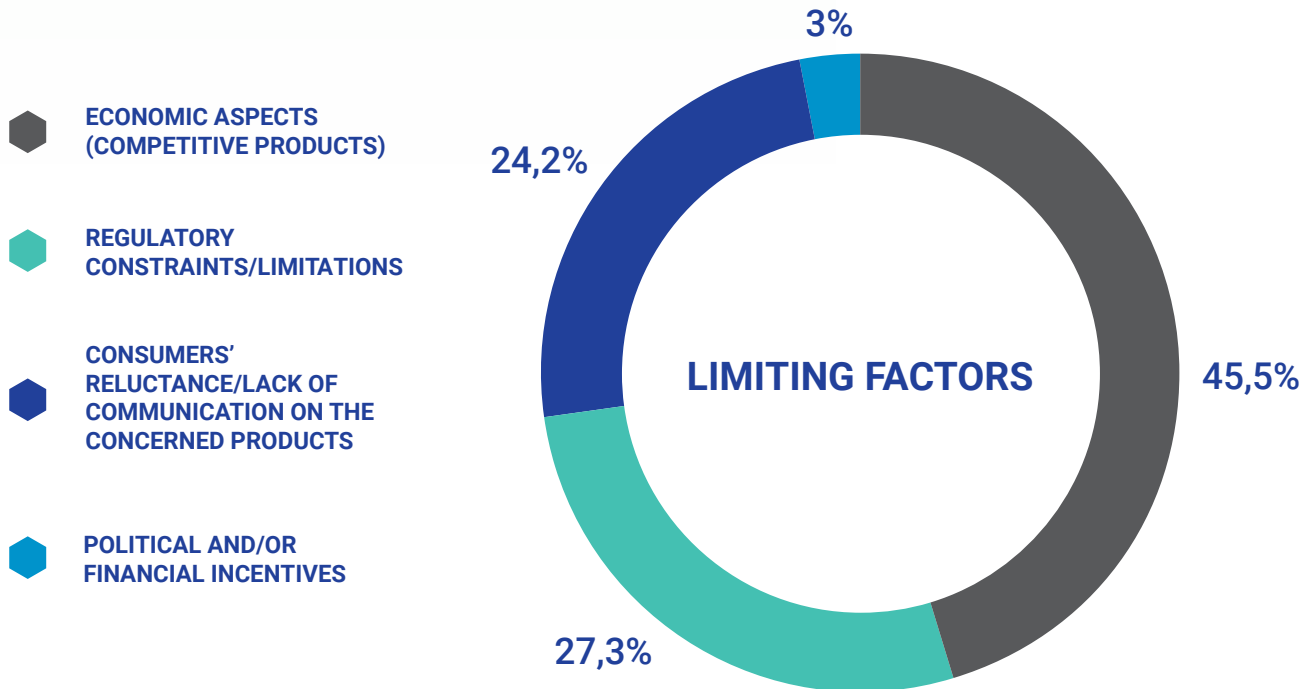
(Source: IPIFF Questionnaire—February 2023)

3. Main challenges ahead of the sector

Although insect-producing companies have created a lot of critical mass over the last few years, the sector is far from having achieved its full potential.

“The European insect sector is at a crossroads. Before, insect producers were challenged by legislative barriers that were inhibiting them from selling their products as food, feed for aquaculture, poultry, and pigs. This challenge is now in the past. However, several other challenges are laying in front of the sector, including on the legislative side.”

Heinrich Katz
IPIFF Treasurer



(Source: IPIFF Questionnaire—February 2023)

Earlier this year, IPIFF’s members were consulted on the **main challenges** and ‘**limiting external factors**’ for the development of the European insect sector, which they are currently facing. The answers provided by the 33 respondents are summarised in the pie to the left.

From the aforementioned survey’s answers, several broader conclusions can be drawn:

- **Scaling up of production** remains undoubtedly the **main challenge of the insect sector** at the moment. Significant efforts deployed over the recent years (see section 1) will therefore be continued in order to achieve the necessary size. Economy of scale shall notably be fuelled through substantial investments in breeding and processing technologies (including automation and controlled environment production

systems), or the development of new products and functionalities, thereby reducing production costs (the aforementioned challenges are implicitly covered under the entry ‘economic aspects (competitive products)’ as referred to in the aforementioned graph);

- **Efforts to document and communicate on insect production credentials** (i.e. nutritional and sustainability benefits) should be stepped up. Such efforts would provide an incentive for customers (e.g. feed manufacturers, livestock farmers) and European consumers to prioritise the use of such complementary food or feed sources. Several other ‘traditional protein sources are characterised by lower prices but are far less sustainable alternatives, while creating the EU’s dependance on imported proteins and contributing to the EU protein deficit.

- **Several EU regulatory barriers must be unlocked at EU level.** These efforts should be combined with the **establishment of more tailored standards** ('regulatory constraints' was ranked by the IPIFF members as the second most important challenge, as evidenced through the above graph) (see Chapter III below for more details).

In IPIFF's view, these various challenges have to be addressed all together. These drivers are indeed interconnected, e.g. increasing communication on the 'premium dimension' of insect food and feed products can contribute to diminishing the economic pressure on insect producers by (partially) overcoming the competitiveness gap with traditional protein sources. The unlocking of remaining EU regulatory barriers (through EU approval of new feeding substrates for farmed insects) will contribute to the creation of more favourable economic conditions for insect producers, notably through the reduction of their input costs, while efficiently upcycling these materials into the food and feed chains.

CHAPTER II: SETTING THE BASIS FOR A FUTURE-PROOF EU POLICY/REGULATORY FRAMEWORK

1. Achieved regulatory milestones by the European insect sector

The expansion of the European insect sector was notably made possible thanks to EU policy milestones achieved since 2017. The **EU institutions have indeed adopted a series of important reforms for the sector**, thereby laying the regulatory foundations for insect-producing companies to scale their businesses across the EU. These regulatory efforts saw the establishment of **baseline harmonised standards** for the production of insects and their use as **food, feed** and as a **fertilising product** (in the case of insect frass).

An overview of the reforms is provided below:

- **On 8 October 2015**, the **European Food Safety Authority** published a **risk profile opinion evaluating the 'safety of insects as food and feed.'** This opinion has paved the way for several major EU policy reforms for the insect sector.

- **On 1 July 2017**, the insect sector saw the **approval of insect-processed animal proteins in feed for aquaculture animals**. This authorisation was expanded to pig and poultry markets in September 2023.
- For further details on the above reform, see document [FAQs on the authorisation of insect PAPs in poultry and pig feed](#).
- The production and marketing of insects as food is governed by the **‘Novel Foods’ legislation**—i.e. [Regulation \(EU\) No 2015/2283](#). This legislation applies to all categories of foods that ‘were not used for human consumption to a significant degree’ within the European Union before 15 May 1997, which is the case of whole insects and their derived products. This means that **whole edible insects and their derived ingredients can be lawfully placed on the EU market—but require pre-market authorisations**. Such authorisation is granted following the submission of an application to the European Commission (EC), the **safety evaluation by the European Food Safety Authority (EFSA)**, and the **favourable votes of the EU Member States (MS)**. In **2021**, the EU Insect sector saw great developments with the **first authorisation for edible insects as Novel Food**. **5 other products have been authorised** since then, covering **4 different species** (i.e. *Tenebrio molitor*, *Acheta Domesticus*, *Locusta Migratoria* and *Alphitobius diaperinus*).
- For more details, see [info sheet on the commercialisation of edible insects as Novel Food in the EU](#) & the [info sheet on the applicable legislation to insect food business producers](#).

- **On 5 November 2021**, the European Commission adopted a set of **EU regulatory provisions** (i.e. standards embedded in [Commission Regulation \(EU\) 2021/1925](#)) which define the conditions for the placing on the EU market of **insect frass, as organic fertiliser and/or soil improver**. Through this text, the EU legislator defined a series of standards for processing insect frass (i.e. according to these standards, frass shall undergo a 70°C heat treatment for one hour and comply with a series of microbiological limits).

“The above regulatory developments marked a breakthrough in the development of the European insect sector. These milestones indeed gave ‘regulatory visibility’ for the concerned companies to secure their investment plans and organise their business and commercial activities.

The shaping of harmonised baseline rules across EU Member States is a key component for having a regulatory space in which insect producers can navigate with sufficient certainty. The EU landscape contrasts with the regulatory landscape observed in many other regions of the world where such guarantees do not exist.”

Christophe Derrien

IPIFF Secretary General

Through the aforementioned reforms, the **EU Legislator complemented the legal framework** that comprises general provisions and obligations

governing the conditions for production for any operator active along the food and feed-production/processing chain (thereby including insect production and processing activities).

IPIFF has developed (and continuously does so) a series of **guidance documents** in order to **assist EU insect producers in the implementation of their general obligations** and of **EU standards applying specifically to their activities**. The prime objective of the European insect production sector is to produce safe products suitable for both human consumption and animal feed. This robust set of rules concerns both **labelling and hygiene standards**.

- EU rules contained under the **‘General Food Law’** ([Regulation No 178/2002](#)) and the **‘Hygiene Package’** (e.g. [Regulation No 852/2004](#) on the hygiene of foodstuffs and [Regulation No 183/2005](#) laying down requirements for feed hygiene) define **general principles and standards in the area of food and feed safety**. Like any other food or feed business operator—insect producers are responsible for ensuring the safety of the marketed products, in line with the general obligations contained in these legislations. As such, actors active in the primary producing (breeding) or processing of insects and/or of their derived products must conform to the followings:
 - **Registration** or **approval** of their activities before national competent authorities;
 - Establishment of **hygiene standards** to be applied at the different stages of production.

- Initiated by the IPIFF members in 2017, the [IPIFF Guide on Good Hygiene Practices](#) describes all **general obligations** governing the conditions of production of insect food and feed products (see section 1.2.1 ‘General food and feed hygiene requirements’) and **practical recommendations** for operators to implement these provisions on the ground.

This guidance document has been **officially endorsed by the EU Standing Committee on Plants, Animals, Food and Feed** (i.e. Committee composed of EU Member States competent authorities, under the auspices of DG SANTE, European Commission) in November 2022.

- **Insect food and feed producers are subject to specific labelling requirements.**
 - **Insect-based food products** are subject to all provisions of the ‘**general**’ **EU food labelling framework**, (i.e. [Regulation \(EU\) No 1169/2011](#)). Additionally, each edible insect novel food product must comply with the requirements addressing its labelling, as established in the **respective ‘novel food’ Implementing Regulation**, which authorises its commercialisation in the EU (e.g. compulsory labelling provisions on designation of the food, its conditions and/or restriction of use, allergic properties and allergic risks for certain categories of populations).
 - Back in 2019, IPIFF developed a guidance document aiming at supporting insect food producers in the implementation of the aforementioned EU provisions. Titled ‘[Guidance on the provision of food information to consumers](#),’ the document is currently being revised in order to reflect recent EU regulatory developments concerning insect food products.¹
 - **Producers of insect feed ingredients** shall comply with the **EU feed labelling rules** contained in [Regulation \(EC\) No 767/2009](#) which establishes the rules on the **marketing of feed materials and compound feed**. Specific labelling rules are foreseen under the EU regulatory framework applying to **animal by-products**, i.e. [Regulation \(EC\) No 1069/2009](#) and [Regulation \(EU\) No 142/2011](#) (e.g. labelling as Category 3 material) whereas [Regulation \(EC\) No 999/2001](#) on ‘**TSE control**’ defines the **labelling conditions for processed animal protein derived from farmed insects** (as well as porcine and poultry animals) and compound feed containing such processed animal protein.
 - IPIFF is developing a guidance document, describing the different EU feed labelling

¹ The new version will be available on the IPIFF website by the end of 2023 or during the first quarter of 2024.

regulatory provisions to be applied by insect producers, as well as practical recommendations for their implementation.²

A summary overview EU standard applied by insect producers can be found in the document titled '[A glimpse of a modern insect farm.](#)'

While insect-farming practices are not under the scope of the EU standards on animal welfare, **IPIFF's members do however take animal welfare seriously.** We are committed to promoting good welfare practices in husbandry, transport and at the point of death, ensuring insects' well-being.

- To this end, IPIFF has developed guidance for insect producers to implement such good practices. Contained in the IPIFF Factsheet '[Ensuring High Standards of Animal Welfare in Insect Production](#)' (November 2022), this guidance document uses the Brambell's 5 degrees of freedom as basis for the establishment of good welfare practices provided that these take into account insect production specificities.

2. The development of EU tailored standards would be a game-changer for the industry

Building upon the recently achieved milestones, we are of the view that the path of EU reforms should continue in order to create the conditions for the steady development of the insect-farming sector.

- Through the reforms completed in 2017 and 2021 (see section 1 above), the **EU legislator recognised the economic potential for using insects in food and feed applications**, while providing clear and robust standards to be complied by European insect producers in view of commercialising their products on the EU market;
- We now **plead with the EU public authorities to engage in the necessary reforms** with the view to unleashing the full potential of our sector, and thereby effectively contribute to the achievement of EU Policy goals for a transition towards more sustainable and resilient supply chains.

² This document should be made available on the IPIFF website during the first quarter of 2024.

We believe that a collective effort is needed in order to **unlock opportunities under the current EU regulatory framework and repeal unjustified restrictions** under current EU rules.

According to the IPIFF members, such regulatory changes would constitute, by far, the major driver towards the growth of the sector (IPIFF Questionnaire—February 2023).

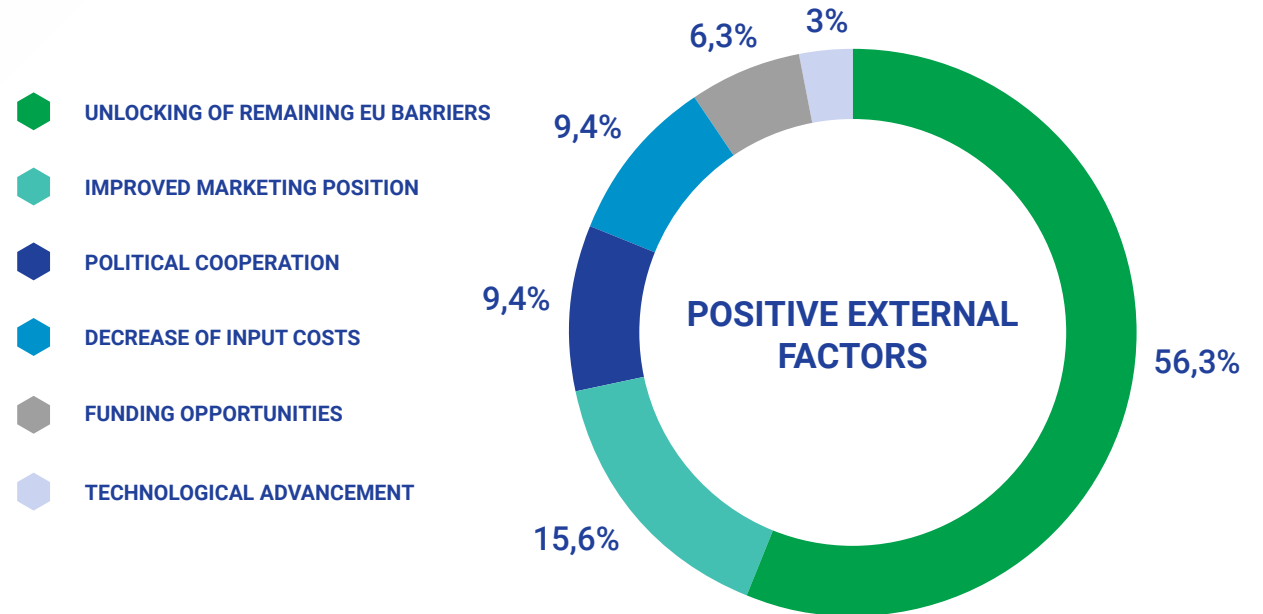
Through the aforementioned questionnaire, IPIFF’s members were consulted on the **‘positive factors’** which would contribute to the growth of the European sector over the next few years.

In IPIFF’s view, the aforementioned drivers are connected, e.g. the decrease of input costs could be achieved through the unlocking of the remaining EU barriers (e.g. authorisation for using meat and fish containing former foodstuffs as substrates for farmed insects).

Current EU legal texts do not apprehend the ‘fundamental differences’ which exist between insect production (and/or the production of other invertebrates) and other more ‘traditional forms’ of rearing (e.g. production of domestic ungulates), simply because the Legislator did not envision the particular case of insect production. This regulatory approach led to ‘restrictive’ categorisation; many of these ‘general’ EU provisions are indeed not tailored to the physiology of invertebrates animals and to insect production realities, which in many respects differ from ‘mainstream’ farming and/or food/feed processing models.

In practice, such classifications lead to hamper the potential of our sector:

- By unduly **reducing the spectrum of materials being authorised for the feeding of farmed insects** produced in the EU (restrictions under the EU ‘TSE’ and animal by-products legislation, which were specifically envisaged for vertebrate food producing animals, do also apply to farmed insects);
- By **hindering the possibilities to harness the benefits of insect by-products** (e.g. insect frass);
- By **preventing the use of natural and tailored alternative solutions by the EU organic production sector**.



(Source: IPIFF Questionnaire—February 2023)

The [IPIFF Regulatory brochure](#) (May 2020) comprises a comprehensive overview of policy proposals in view of overcoming such regulatory hurdles (see Chapter II ‘maximising the circularity potential of the sector through tailor-made solutions’).

Since the drafting of this document, the EU Policy makers (e.g. European Commission) **started to undertake several major reforms** (and/or engaged preliminary discussion with EU Member States authorities) with the view to **opening up the field of possibilities foreseen under the current EU legislation**.

We urge the EU institutions to step up these efforts in order to **adjust the EU provisions which are still not adapted to insect production realities**. These efforts should materialise through the following **policy reforms**:

- **Registration of processed insect frass under the EU fertilisers legislation**, thereby giving full EU market access for the use of insect dejecta as a fertilising product (reform expected by end of 2024–1st half of 2025);
- **Setting EU regulatory standards for insect organic production** and authorisation for **using conventional insect proteins in organic aquaculture** (new rules could be in place as from the end of 2024–1st half of 2025);
- European Commission proposal in view of **including more feeding substrates to be legally applicable for insect farming** (e.g. meat and fish containing former foodstuffs, depending on the final conclusions of a future food safety assessment to be conducted by the European Food Safety Authority; the European Commission may table a regulatory proposal by early 2026).

“The realisation of these policy objectives will be instrumental in unleashing the potential of our industry. Not only, these are a game changer for insect producing companies, but these will also condition the possibilities of the European insect industry to keep its leading role globally and to compete on equal terms with operators from third countries, who are often not subject to the same legal restrictions.”

Antoine Hubert

IPIFF 2nd Vice President

Achieving these policy priorities will also require **strong collaboration between commercial actors** (i.e. insect producers) and the **academic sphere** (public and private research including other commercial actors along the food and/or feed chain) in order to advance the necessary research and evidence in support of these policy goals.

Meaningful progress on the aforementioned reforms will also condition the **ability of our sector to effectively contribute to addressing major challenges** identified by the European Commission and EU institutions. A strong case can be made for the **establishing of more sustainable and resilient system chains**. These strategic EU policy goals materialised through several recent EU policy initiatives (e.g. Farm to Fork Strategy, the aforementioned Communication on ‘Food Security’, EU wide Protein Strategy, EU organic plan):

- Enacted under the EU Green Deal, [‘EU Farm to Fork Strategy’](#) (published on 20 May 2020) aims to achieve transition towards more sustainable EU food supply chains.
- Following the invasion of Ukraine and its immediate consequences (e.g. inflated energy prices, food shortages, disrupted supply chains), the European Commission partially shifted its **focus towards food security objectives**, as notably materialised through the publication of **the European Commission Communication** entitled [‘Safeguarding food security and reinforcing the resilience of food systems’](#) on 23 March 2022.

CHAPTER III: THE EUROPEAN INSECT SECTOR AND THE EU SUSTAINABILITY AND FOOD SECURITY AGENDA

“The European insect sector has the potential to tick both boxes: Our members are committed to contributing to the realisation of the EU sustainability targets, whilst meeting its newly defined objectives towards achieving greater food security.”

Adriana Casillas

IPIFF President

To this end, our organisation pleads for **the recognition of the European insect sector as a ‘strategic partner’ in the realisation of the objectives described through the concerned initiatives** (see section 1). Owing to its production credentials (e.g. nutritional and environmental) (see section 2) as well positive externalities on local economies (see section 3), and growing acceptance of insect food and feed products among EU consumers (see section 4) is indeed well equipped to provide its full contribution in addressing the aforementioned challenges.

1. Contribution of the insect sector to EU Farm to Fork and Protein policy review initiatives

We believe that insect farming is one of the many solutions to challenges such as population growth, the increasing demand for protein products, as well as the limited land area available for agriculture.

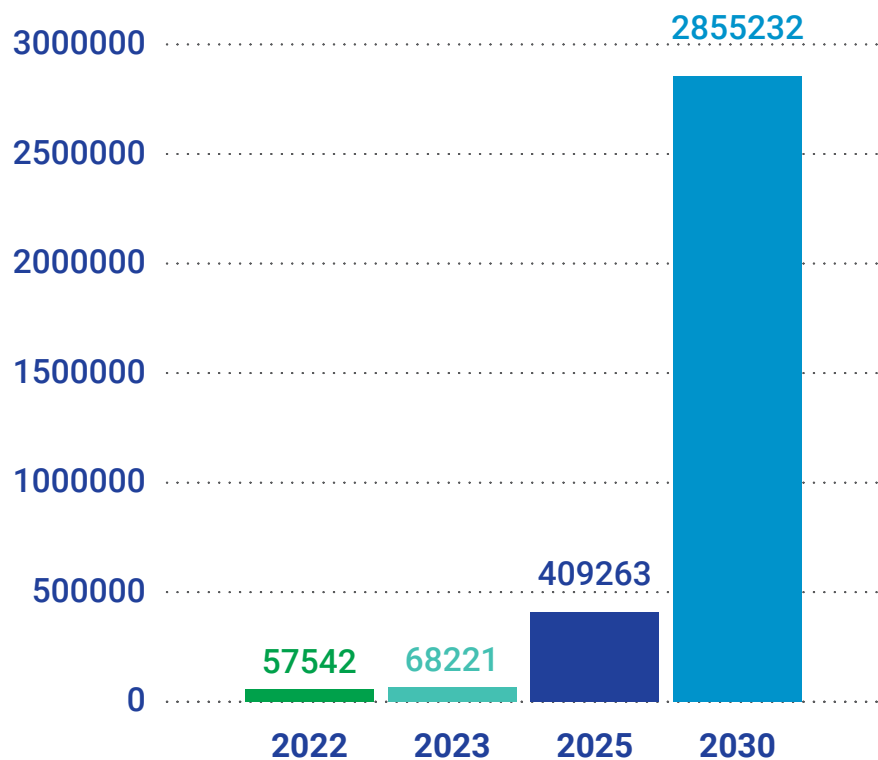
The European insect sector is a viable complementary solution that provides domestically-sourced protein through a decentralised network of European operators by using local and regional input materials.

Through circular practices, insect production can ultimately improve EU’s self-sufficiency in terms of feed materials—‘fewer imports of high-protein feed materials would be needed and the expansion of agricultural land outside the EU would be minimised.’

Photo: Alia Insect farm



FRASS GENERATED PER YEAR



QUANTITIES OF INSECT FRASS IN TONNES FROM 2022 UNTIL 2030

(Source: IPIFF Questionnaire—February 2023)

- [IPIFF position paper 'Contribution of the European insect sector to improving sustainability from 'Farm to Fork''](#) (18 February 2020)

The European insect sector can contribute to achieving **European Commission endeavours to foster the development of bi-based fertilisers at EU level**, through the upcycling of insect frass as a fertilising product ([European Commission Communication on 'ensuring availability and affordability of fertilisers'](#) (9 November 2022)).

IPIFF forecasts that European insect producing companies should **produce over 120,000 tonnes of insect feed products in 2025**. Increased insect ingredients production will go hand in hand with growing quantities of frass generated, i.e. we forecast that over **400,000 tonnes of insect frass** should be produced by European insect producers in 2025.

Building on synergies between insect, algae and yeast products (these different protein sources can reduce the potential nutrient deficiencies when used in combination with other protein-based products in consumers' diets), the **InnovProtein EU coalition** was created on 1st December 2021—as a joint initiative between EABA, COFALEC and IPIFF—with the common aim of supporting the overall objectives of the **'EU Farm to Fork Strategy'** and the transition towards more sustainable EU food supply chains. To this end, its members aim to support efforts to **upscale protein production** within the European Union as well as to consolidate efforts towards **achieving greater autonomy and diversification of food and animal feed sources**.

- More information about this joint initiative can be found through the following [webpage](#). Its main policy priorities are described through its policy roadmap.³

2. Informing and documenting insect production activities credentials

"Insects combine nutritional, functional and environmental benefits which make them very suitable for animal feed. Insect PAPs have an amino acid profile that makes them highly digestible for animals. In addition, they contain relevant vitamins (vitamin B12, cobalamin, which is a limiting factor in ingredients of vegetal origin, and vitamin B2, riboflavin) or fatty acids, as well as chitin—which has immunostimulatory properties."

Laura Gasco

Senior Research at Turin University

³ The document is currently being finalised and will be made available on the IPIFF website soon.

Insects are a natural component of the diets of wild animals such as carnivorous cats, fish, poultry, and pigs. As insect PAPs are generally used as a complementary or partial replacement to protein feed ingredients, the use of insect-based feed may be incorporated into the production of eggs, chicken and in pigs.

- For further information about nutritional and functional properties aspects, see document [‘The nutritional benefits of insects in animal feed.’](#)

“Insect-based nutrition is emerging as a whole new category in food and feed systems. It has the potential to bring new value-added propositions based on its nutritional, functional, and environmental benefits.

Insect proteins will be used alongside fishmeal and soybean meal but at relatively small inclusion rates, sufficient to achieve their functional properties.”

Rabobank Market Study (February 2021)

The **low environmental impact of insect protein production** is the major driving force of this sector. Producing top-tier protein with a **fraction of land and water use** compared to other livestock sectors, while **valorising food waste and agricultural by-products** constitutes a competitive advantage of the insect sector. Insects indeed have the potential to **become resource-efficiency champions**—upcycling products that generate costs and GHGs emissions into sustainable feed, food and ingredients. Being highly versatile and efficient, insects can bio-transform many of these materials into a wide range of higher-value products and ingredients—that can further be included into the food and feed chains. As such, the insect sector also contributes to reducing the emissions of feed manufacturers and livestock producers, thereby improving their overall environmental performance.

Insect farming may also have a **significant impact on biodiversity**, by reducing the use of traditional protein sources, which may have damaging consequences on our ecosystems.

“Edible insects have the potential to contribute to healthier and more sustainable European diets. Their high protein content and diverse amino acid composition is well-recognised, but other nutrients such as vitamins, minerals, healthy fats and fibres can contribute to human health as well.”

Paul Vos

Expertise leader—Nutrition Quality & Health, Coordinator of the Horizon Europe GIANT LEAPS project at Wageningen food & Biobased Research)

The high protein content of edible insects makes them a potent complement in diets with reduced meat and dairy consumption (edible insects can complement low-protein diets thanks to their diverse amino acid composition).

- [IPIFF Info sheet on insect food products](#) (September 2023)

The **application of insect frass on land** (i.e. insect dejecta) **shows positive results on plant growth and health**, thanks to the presence of nutrients in a readily available form (Nitrogen, Phosphorus, Potassium) as well as to the presence of plant-growth promoting microorganisms.

- **The benefits of insect frass as soil fertiliser are many:**

- Provides macro- and micro-nutrients to the soil;
- Supplies organic matter that enhances the microbiological activity in soil;
- Increases plant tolerance to abiotic stress and resistance to pathogens;
- Offers support to the EU objective to make EU-made soil fertilisers more available and affordable.

Insect frass can therefore help farmers in their soil fertilisation strategies. The circular use of insect frass can play an important role in improving soil fertility and its capacity to store carbon, while reducing the necessity to apply additional inputs, such as mineral fertilisers and pesticides.

See [IPIFF factsheet on ‘insect frass.’](#)

3. Positive contribution of the insect sector in connecting supply chains and supporting rural economies

Insect production practices can bring **diverse opportunities for farmers** involved in animal husbandry and crop cultivation alike, generating additional sources or revenues for local farmers who diversify their activities.

- Insect farming can play a significant role in **making agriculture more attractive for investors**, while also facilitating generational renewal in agriculture.
- More broadly, the insect sector is a **reliable actor in connecting agricultural supply chains**, bringing positive contributions to the revitalising of food-producing areas in both peri-urban and rural regions (e.g. by reducing rural exodus). The insect sector also creates numerous ‘green jobs.’

[IPIFF position paper ‘Contribution of the European insect sector to improving sustainability from ‘Farm to Fork’](#) (18 February 2020):

- **In order to unleash this potential, IPIFF supports the creation of specific mechanisms under the future Common Agricultural Policy (post 2027):**
 - **The ‘next’ CAP** should include **agri-environmental measures targeting diversification initiatives towards insect production** (e.g. Rural Development programme).
 - Insect farmers may **support ‘traditional’ farmers in conforming on Cross-Compliance** on the **standards for good agricultural and environmental condition of land (GAEC)** established at national level and relating to

the following areas: environment, climate change and good agricultural condition of land (e.g. maintenance of soil organic matter level through appropriate practices) public, animal and plant health; animal health and welfare.

- In line with the support for protein crops under the CAP, we believe that insect farming activities should receive **equal attention under the CAP strategic plans**, helping farmers to maximise their contribution with regards to environmental and climate performance.
- Educational efforts towards advisory services, which can be funded either through the 'EIP-AGRI Operational Groups' (funded through European Rural Development Programmes) and **Horizon Europe** multi-actor projects and other thematic networks, ERASMUS programmes.

4. Growing acceptance of insects as food and feed ingredients

Insect-derived food, feed and frass products offer a much-needed protein solution that supports local, European products. The sector has grown sizeably over the past years and it shows tremendous potential to become a critical actor in the creation of resilient food and feed systems across the EU. Scientific evidence on insects' nutritional benefits and safety contributes to increased consumers' acceptance.

Much like any sector, the development of the EU insect production is also driven by accessibility and socio-cultural changes.

Focused, science-based communication with stakeholders such as legislators, civil society, and media can only further help producing companies. Consumer and media research shows that insect-enriched products are perceived as highly nutritional, with a low environmental impact. This, in turn, allows for greater product demand supported by positive traditional and new media coverage.

- **Several recent research papers, surveys and studies** conducted on the consumer acceptance of Edible Insects showcase the **increasing acceptance of edible insects by Western consumers**.
- The same studies show that consumers are more willing to accept food products made with insect ingredients. The main factors that influence consumers' willingness to adhere to alternative protein food products being related to their **high nutritional value and low environmental footprint**.
- IPIFF recently deployed a **wide EU survey** (survey conducted in 6 EU countries, i.e. France, Germany, Belgium, Sweden, Italy and Poland) **among 5000 consumers** which aims to assess the evolution of the acceptance rate of insect-derived food products. The results of this survey will be communicated (e.g. via the IPIFF website) by the end of the year 2023.



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