THE INTERNATIONAL PLATFORM OF INSECTS FOR FOOD AND FEED

'The production & commercialisation of insects as a novel food in the European Union (EU)'

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12 May 2020

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voice of insect producers

Consolidating dialogue

with EU public authorities

Advocating

for appropriate legislative frameworks

Support

in the effective implementation of legislation

Promotion and development

of shared standards and best practices

Collaborative actions

with other umbrella associations

The International Platform of Insects for Food and Feed – *a member-driven umbrella organisation*

The Netherlands: Protix, Proti-Farm, Koppert, NGN, Amusca, Entogourmet B.V.

Belgium: Inagro, Thomas Moore, Gent University, KU Leuven

Ireland: Hexafly

UK: Entomics, Entocycle, Insect Technology Group (ITG)

France: Ynsect, Agronutris, Jimini's, NextAlim, Mutatec, Innovafeed, Protifly, Invers, Nutri'Earth

Spain: Entomo-Agroindustrial, Leitat Technology Center, MealFood Europe, Universitat Rovira i Virgili, IMASDE

Denmark: Danish Technological Institute, Enorm, Haarslev, BioInsect

Norway: Invertapro

Sweden: Tebrito

Russia: Entoprotech, Ekobelok

Lithuania: Insectum

Latvia: Latvia University of Life Sciences and Technologies

Poland: HiProMine, Proteine Resources

Ukraine: Insect BioHub

Germany: Hermetia, Illucens, Plumento Foods, Snack-Insects, Reinartz, GreenCycle, Enterra, Wendepunkt

Switzerland: Essento, BITS, Rethink Resource

Austria: Livin Farms, Ecofly

Bulgaria: Nasekomo

Croatia: Mudro Bioindustry

Italy: University of Parma, Italian Cricket Farm, University of Basilicata, University of Pisa, ALIA

Non European members
Beta Hatch, Entofood, FreezeM.

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IPIFF & its members

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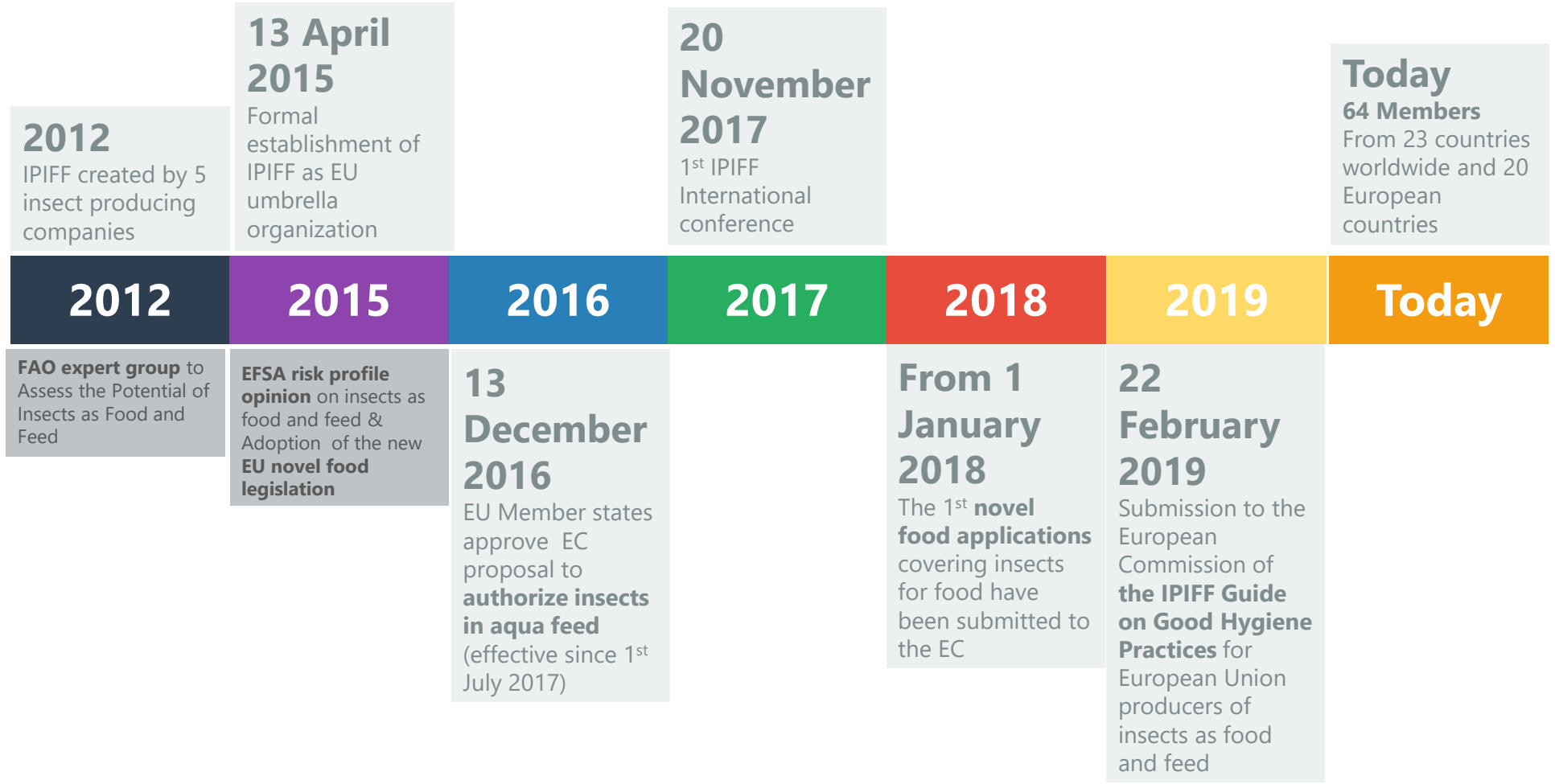
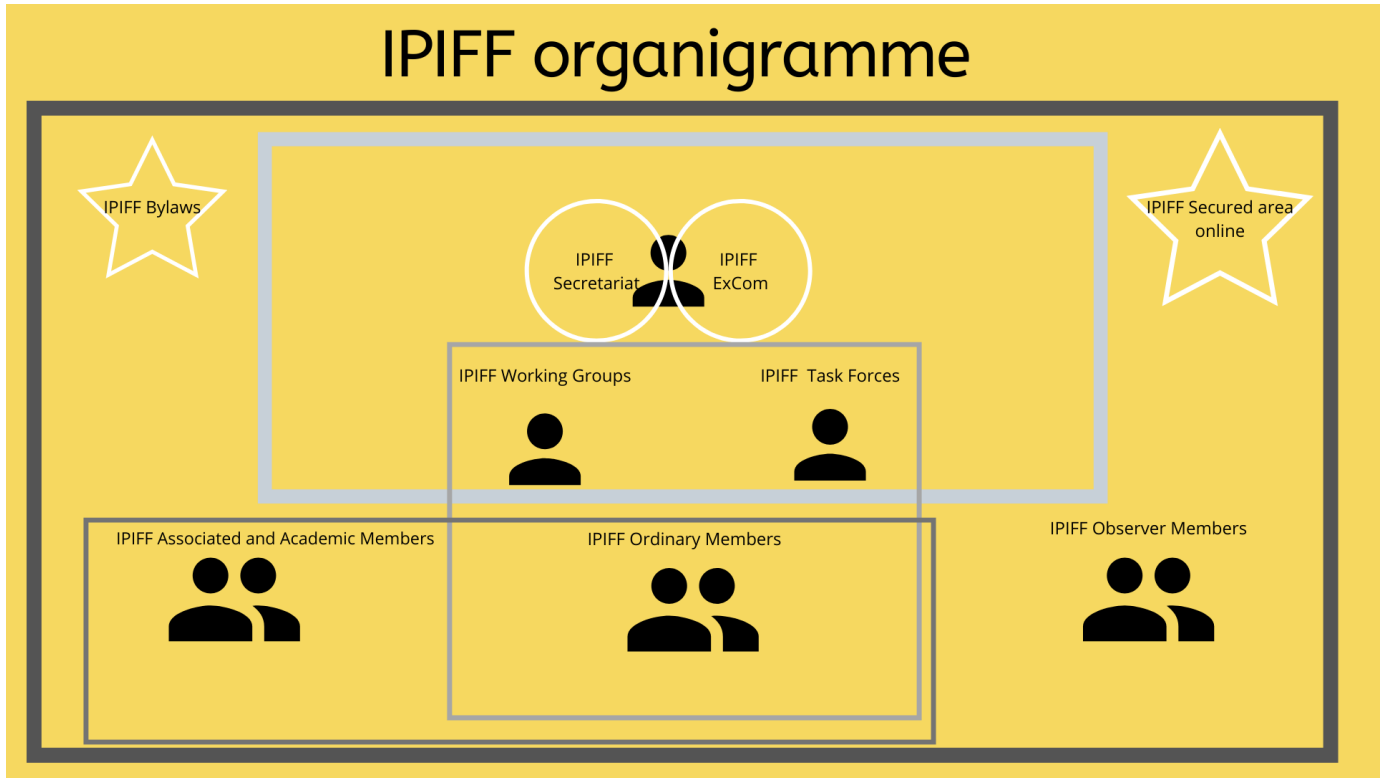
IPIFF key milestones



IPIFF Working Groups and Task Forces



- **General Assembly** (physical meetings), Telcos) and **Executive Committee;**
- **Sectorial Working Groups** ('food safety & consumers' information' & 'feed hygiene & animal nutrition');
- **Task Forces** (e.g. 'insect frass', 'Good Hygiene Practices**)** and **Communication & Coordination Centre;**
- Beyond Europe**: coalition group with regional insect associations** (AFFIA, IPAA, NACIA);
- Punctual support to **'national' EU Member State activities** (e.g. interface with CIPA).

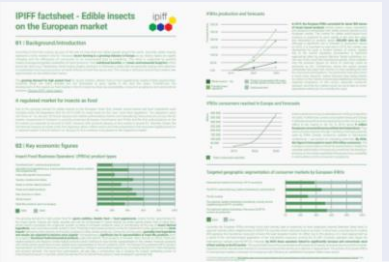
IPIFF publications on insects as food

IPIFF vision paper: The future of the insect sector towards 2030

IPIFF factsheet:
Edible insects and human nutrition

IPIFF novel food briefing paper

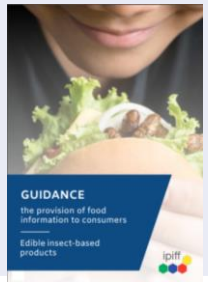
IPIFF factsheet:
Edible insects on the European market



IPIFF Guide on Good Hygiene Practices

IPIFF factsheet:
Ensuring high standards of animal welfare in insect production

IPIFF guidance on the provision of food information to consumers for edible insect-based products



Research Priorities: Building bridges between the insect production chain, research and policymakers

IPIFF communication and outreach activities

- **'Traditional' sector representative** (e.g. position papers) and **PR materials** (e.g. Press release);
- **Guidance documents** (Guide on Good Hygiene Practice, Labelling guidance, novel food guidelines, etc), **factsheets** and other **Q&A documents;**
- Proactive **media outreach,** incl. via social media channels;
- Organisation of **various events** ('high level' conferences, 'thematic' Workshop);
- Beyond Europe: coalition group with regional insect associations (AFFIA, IPAA, NACIA);
  - ✓ White paper on the global future of insects as food and feed to be released in July 2020
- Participation in international conferences
- Outreach and dialogue with international organisations (e.g. FAO) to contribute in the development of the global insect as food and feed sector

II. IPIFF Guide on Good Hygiene Practices

The framework of the Guide

General Requirements

EU Regulations

Insects as food and feed specific

1.3. Traceability and record keeping

1.3.1. General requirements

Traceability is a risk management instrument to be used to identify and contain a possible food and feed safety problem more easily and efficiently. Relying on the 'one step back – one step forward' approach as well as on record keeping measures, insect producers must have systems and procedures in place that enable them to send traceability information to the relevant authorities upon request. This ensures that product withdrawals and recalls are precise and targeted.

Such system should enable, at all times, to trace any raw materials, ingredients, additives and primary packaging materials backward (one step upstream in the food chain) and to trace any finished products that have left the manufacturer forwards (one step downstream in the food chain).

Article 18 of Regulation (EC) No 178/2002 specifies the main principles and obligations implied by traceability.

Article 18 Regulation (EC) 178/2002 on 'General Food Law' states:

'1. The traceability of food, feed, food-producing animals, and any other substance intended to be, or expected to be, incorporated into a food or feed shall be established at all stages of production, processing and distribution.

2. Food and feed business operators shall be able to identify any person from whom they have been supplied with a food, a feed, a food-producing animal, or any substance intended to be, or expected to be, incorporated into a food or feed. To this end, such operators shall have in place systems and procedures which allow for this information to be made available to the competent authorities on demand.

3. Food and feed business operators shall have in place systems and procedures to identify the other businesses to which their products have been supplied. This information shall be made available to the competent authorities on demand.'

ANNEX II

LIST OF INSECTS AUTHORISED FOR THE PRODUCTION OF PROCESSED ANIMAL PROTEINS INTENDED AS FEED FOR FARMED ANIMALS (OTHER THAN FUR ANIMALS) WITHIN THE EU[45]

1. Gryllodes sigillatus (Walker, 1869)

Order: Orthoptera; Family Gryllidae

Tropical house cricket, Indian house cricket or banded cricket, native to Southwest Asia, widespread in tropical regions around the world. Due to its high thermal optimum, this species is considered non-invasive in temperate zones.

Adults grow up to 20-22 mm, both male and female have reduced wings, in females only a small scale is visible behind the thorax. Tropical house crickets are light yellow in colour and can be easily distinguished from house crickets by two thick, black bands on the thorax and upper abdomen.

Figure 1. Gryllodes sigillatus

Compilation and consolidation of Legislative data in respect to the sector clearly.

Substrates			Insect production	Target species			
					Processed animal proteins	Insect fats and hydrolysed proteins	Live
✓	Vegetal-origin substrates, fishmeal, blood products from non-ruminants, di and tricalcium phosphate of animal origin, hydrolysed proteins from non-ruminants, hydrolysed proteins from hides and skins of ruminants, gelatine and collagen from non-ruminants, eggs and egg products, milk, milk based-products, milk-derived products and colostrum, honey, rendered fats.	Regulation (EU) No 142/2011; Annex XIV Chapter 1 Section 2, 5b		Pets and fur animals	✓	✓	✓
✓	Unprocessed former food stuff: milk, eggs and their derived products, honey, rendered fats, collagen, gelatine;	Regulation (EC) No 142/2011; Annex X, chapter 2, section 10		Aquaculture	✓	✓	✓
✗	Unprocessed former food stuff meat and fish	Regulation (EC) No 142/2011; Annex X, chapter 2, section 10		Poultry	✗	✓	✓
✗	Catering waste	Regulation (EC) No 1069/2009, article 11 (b)		Pigs	✗	✓	✓
✗	Animal manure	Regulation (EC) No 767/2009, Annex III chapter 1 (1)		Authorised list of insect species which are authorised for the production of processed animal proteins (for pet food and aquaculture animals)			REGULATION (EU) No 142/2011; Annex X Chapter 2 section 1A.2.
				No restriction as to the insect species			REGULATION (EU) 2017/1017 on the catalogue of feed materials covers: Entry: 9.2.1 for 'insect fat' Entry 9.6.1 for 'hydrolysed proteins of insects' Entry 9.16.1 for 'terrestrial invertebrates live' Entry 9.16.2 for 'terrestrial invertebrates, dead'

In line with current industry practices and recommendations

Application of the Guide

Reg. EC 852/ 2004	• **Registration** as 'food business establishment' provided for by article 6.2. • Must comply with Annex I, Part A (contains **requirements for operators** active in primary production of food, incl. hygiene provisions and record keeping).	Management of Substrates and rearing of insects. Chapter 2 and 3 of the Guide	• **Recommended practices** in the management of incoming substrates • **Recommended practices** associated with insect rearing activities :1. Administration of feed/substrates to insects; 2. Insect growth phase; 3. Insect harvesting; 4. Pre-treatment step.	**Sector Practices**
	• Must comply with Annex II (i.e. contains **requirements** regarding all food premises, transport, equipment requirement, food waste, water supply, personal hygiene, heat treatment, training) also contains requirements regarding **HACCP** based procedures. • **Registration** as 'food business establishment', provided for by article 6.2.	Killing and further processing of insects for food & feed. Chapter 4 to 7 of the Guide	• **Processing methods** applied to insects intended for human consumption and animal nutrition • **Prerequisite programs (PRPs)** • **Monitoring** (sampling and analyses of hazards) • **Implementation of HACCP principles (Chapter 7)**	

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Monitoring (sampling and analyses of hazards)

Guidance on :

- Hazards to be monitored (6.6.2. Food safety requirements and recommended practices) : microbiological (Table), chemical, physical and allergens
  - ➢ IPIFF Contribution: Specific Microbiological criteria for edible insect food products - Bacillus cereus and other Bacillus spp. IPIFF encourages that Bacillus cereus and other Bacillus spp. be regulated under Regulation (EU) 2017/2470
- Establish monitoring procedures (sub samples, frequencies, etc.)

For insects as food activities

Number of subsamples and frequencies for sampling of insect-based food products should be increased/ decreased, Specific chemical and microbiological hazards should be monitored, respective to the conducted risk assessments on the products (depending on insect species and/or product form-flour, whole insect, etc) and the weights of each batch. Minimum sampling frequencies are illustrated below for a start-up phase.

Product	Analysis	Frequency	Number of subsamples	When	Responsibility	Storage locations
Insect- based product as raw material	Microbiological (all)	Once a month when >1 batch is produced per month/ every batch if <1 batch is produced in 1 month/ if suspicion	1	Arrival	Internal / External qualified laboratory	All
	Microbiological (specific)*	Every batch	1	Arrival	Internal / External qualified laboratory	All
	Chemical (all)	Once a year	1	Arrival	Internal / External qualified laboratory	All
	Chemical specific	Every batch	1	Arrival	Internal / External qualified laboratory	All
During production and raw material	Moisture content percentage	Every batch	1	During production and arrival	Internal / External qualified laboratory	All
Insect based product final product**	Microbiological (all)	Once per month	1	Process end	Internal / External qualified laboratory	All
	Chemical (all)	Twice per year	1	Process end	Internal / External qualified laboratory	All
	Chemical specific	Per quarter	1	Process end	Internal / External qualified laboratory	All

*** Yeast/Moulds, Listeria monocytogenes, Bacillus cereus- and other pathogenic Bacillus species (such as B. cytotoxicus), Enterobacteriaceae, Salmonella, criterion to be maintained according to the risk analysis especially for the monitoring of raw material flours used for the production of insect based food products.**

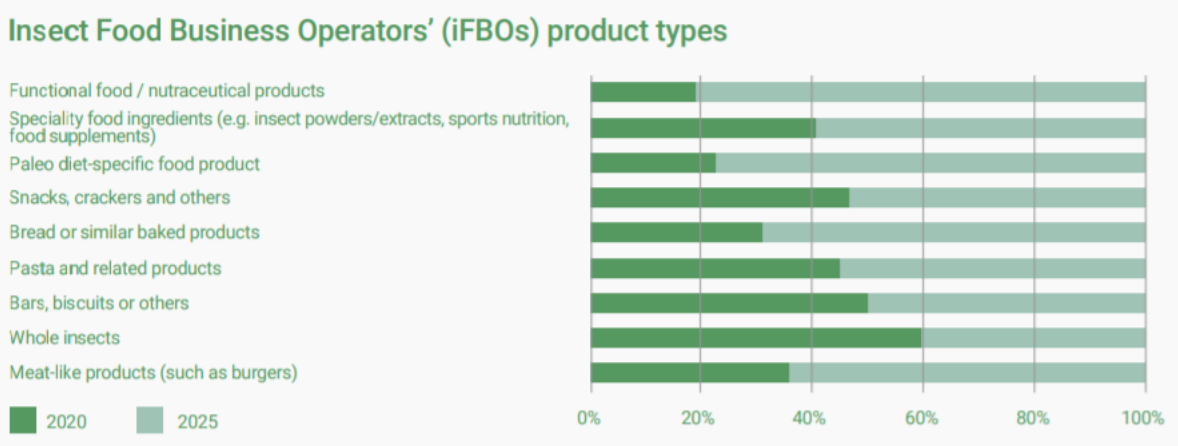
** Parameters are to be defined based on the products in which insects are incorporated (e.g. insect-based pastas, granola bars, etc).

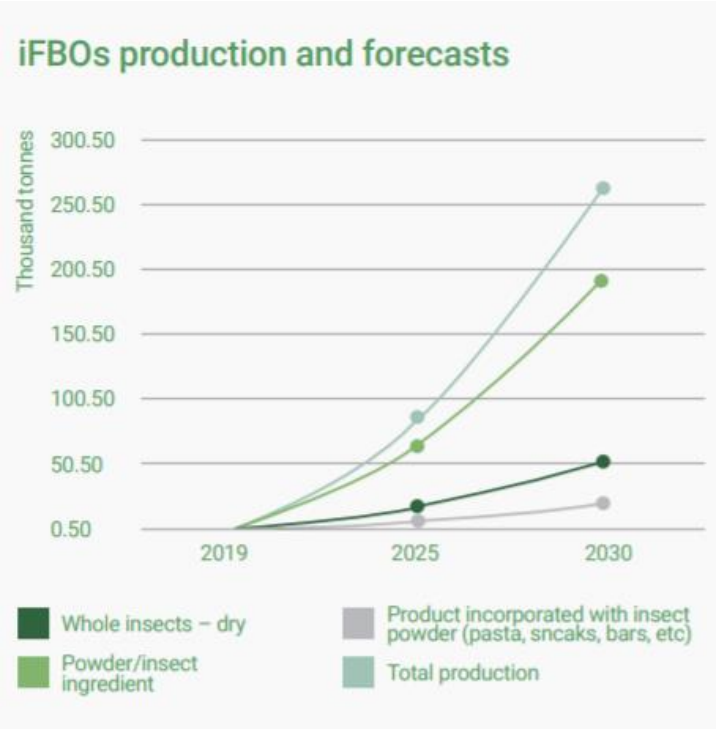
Physical hazards should be determined and monitored accordingly in every batch.

III. Edible insects on the European market

Edible insect products on the European market

- Insects are highly versatile and can be incorporated in foods directly as whole insects (boiled, fried or dried) or in a processed form[4]
- In 2019, the European iFBOs accounted for about **500 tonnes** of insect-based products[5]
- Presently, insect-based products on the EU market are mostly represented by whole insects followed by bars, biscuits, and snacks (crackers or other similar products)
- In the coming years, speciality food ingredients , snacks, meat-like products (such as burgers) and functional food/nutraceutical products are expected to become more popular.





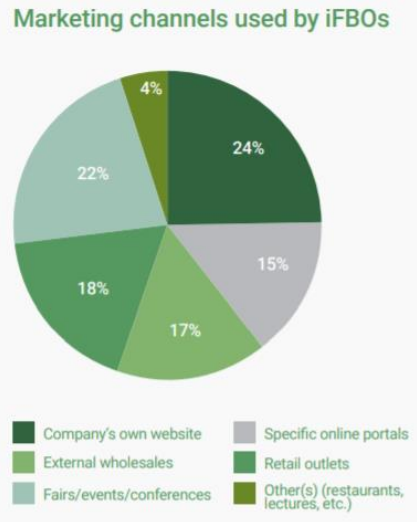
(Source: IPIFF factsheet - Edible insects on the European market)

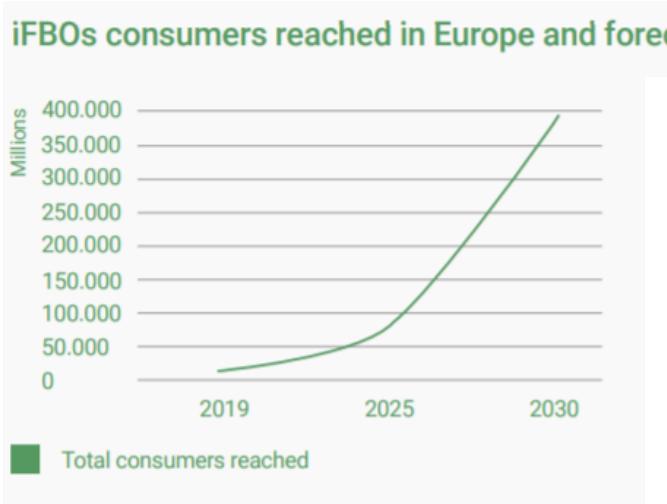
4. Whole insects processed into a granular powder or paste to increase nutritional value or functionality, all the way to insect-derived ingredients, such as protein powder added to food.
5. Whole insects, insect ingredients and products incorporated with edible insects

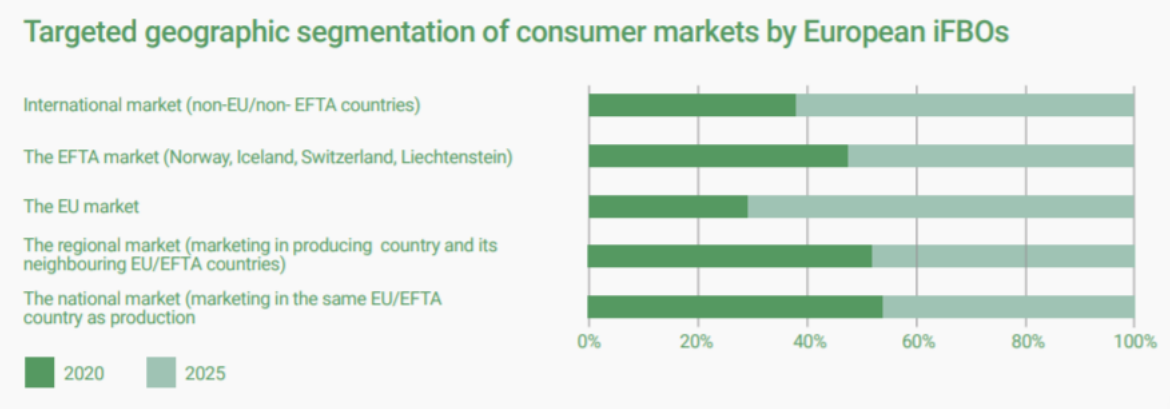
Consumers: Edible insect products

- In 2019, about **9 million Europeans consumed insects** and their derived products[6]
- Consumers were primarily reached through marketing channels presently used by iFBOs (mostly company's website or fairs/events conferences)
- Currently, the European iFBOs primarily focus their activity (sale of products) on their respective national (Member State level) or regional markets (other neighbouring EU MS/EFTA countries which authorise insects as food)
- By 2025 these operators intend to significantly increase and concentrate most of their activity on the EU market.

(Source: IPIFF factsheet - Edible insects on the European market)



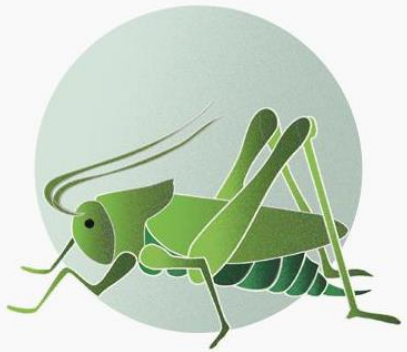




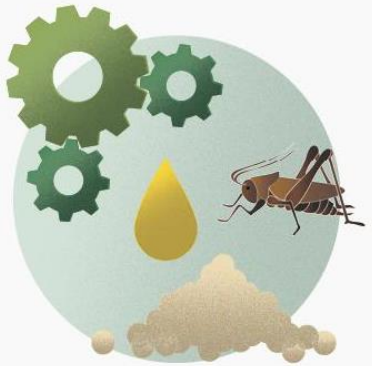
6. Species of insects covered include black soldier fly (*Hermetia illucens*); yellow mealworm (*Tenebrio molitor*); lesser mealworm (*Alphitobius diaperinus*); house cricket (*Acheta domesticus*); banded cricket (*Gryllodes sigillatus*); migratory locust (*Locusta Migratoria*).

European Insect Food Business Operators' (iFBOs): activities

Steps involved in the production of edible insect products



Primary production:
Farming edible insects



Processing of insects for food: processing into insect ingredient(s) whole/powder/extracts

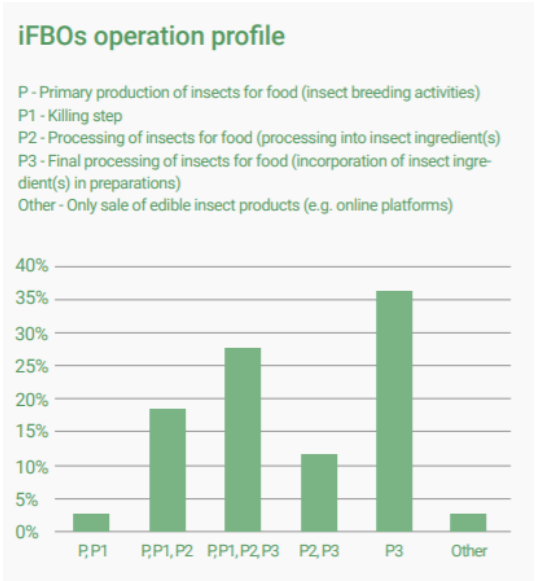
Final processing of insects for food: preparing insect-based food whole, powder, extracts / incorporated - burgers,

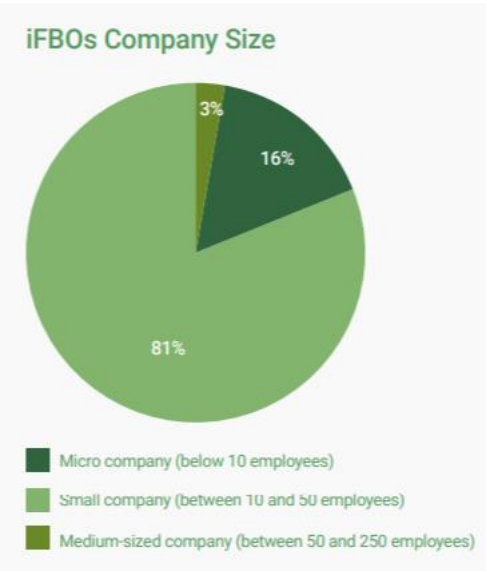
Sale and consumption: sale of product to end-customer

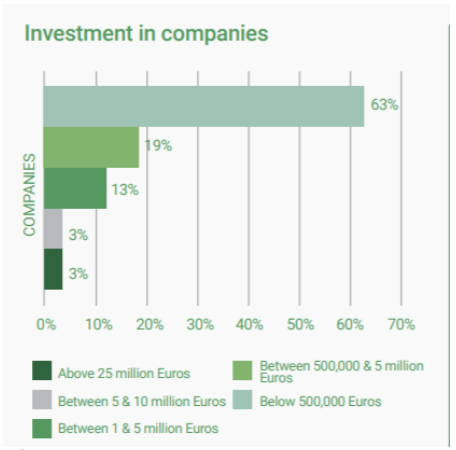
iFBOs: profile

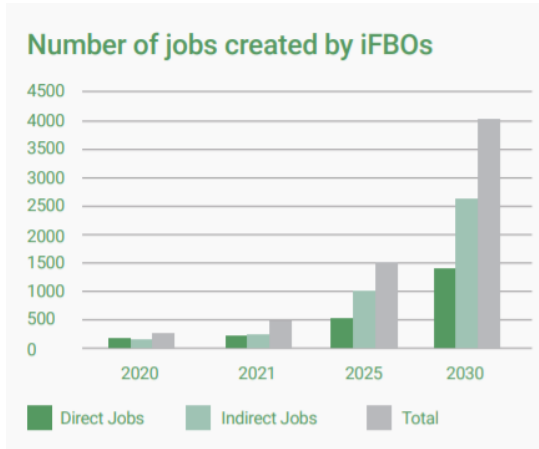
- Micro to small sized companies
- Majority of iFBOs are involved only in the final processing of insects for food[1] followed by iFBOs involved in all the stages[2] of production
- The total investment[3] in the majority of companies is below 500,000 euros, followed by 19% and 13% of companies having up to 1 and 5 million euros respectively.
- Forecasts reflect a significant rise in jobs by 2025,

(Source: IPIFF factsheet - Edible insects on the European market)









1. Incorporation of whole insects/insect ingredient(s) in end product/ preparations
2. Which include farming of insects intended as food, processing them into ingredients (whole/insect ingredients), and incorporating them into food products
3. The total amount of external financial support (capital, investment, debt, subsidies...) received by the company since its inception

IV. Nitrogen to protein conversion factor for insects

IPIFF Contribution : Application of analytical methods for protein determination in insect as food

- Today, **majority of insect producers follow** the European legislative guidelines – i.e. Kjeldahl standard protocol using the nitrogen to protein conversion factor **(Kp) of 6.25** - to determine the protein content of their products.

- **Two preliminary studies** have determined new Kp values for certain insect species, by using amino acid analysis: **4.76 (±0.09)** for insect **larvae** and **5.60 (±0.02)** for **insect protein extract** for three species *Tenebrio molitor, Alphitobius diaperinus & Hermetia illucens* and 5.0 for *Acheta domesticus & Gryllus bimaculatus*

- **IPIFF recognises** the value of the preliminary studies **but does not consider these to be suited for the entire sector** and the diversity of insect-based products

- Determining edible insect sector specific generic values should include:
  - **more studies** are needed in view of their validation of preliminary studies
  - generic Kp **value per insect species**[7]
  - a **representative** set of products **sampled**
  - a **reassessment** of the Kp value **for all dietary proteins** (legumes, meat, dairy, etc)

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7. their characteristics (strain, form: whole/protein extracts), life stage and farming methods will have to be considered

IPIFF Contribution : Application of analytical methods for protein determination in insect as food

IPIFF proposals in relation to future EU policy developments :

- The Kjeldahl standard protocol and the use of the **factor 6.25 should remain** today the only **reference method** for calculating protein content of insect food :
  - The application of this protocol ensures a level playing field among the different insect based products (in the EU and internationally)
  - facilitating comparisons with other food and feed ingredients/products

IPIFF urges EFSA in the context of the future 'novel food' authorisations for insect food products to consider not defining generic Kp values based on pre mentioned studies.

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THANK YOU

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IPIFF (International Platform of Insects for Food and Feed)

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