

May 2024. Sector snapshot

The alternative protein sector in Catalonia

The alternative protein sector in Catalonia: sector snapshot

ACCIÓ

Regional Government of Catalonia (Generalitat de Catalunya)



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Execution

ACCIÓ Strategic and Competitive Intelligence Unit

Barcelona, May 2024

ACCIÓ: institucional

1. An overview of the alternative protein sector
2. Reasons for growth in the sector
3. Main Alternative Protein Companies Detected
4. The alternative protein sector in Catalonia
5. Future trends and opportunities in the alternative protein sector

The alternative protein sector in Catalonia

1. An overview of the alternative protein sector

The alternative protein as a guarantee of a sustainable future

- Global demand for meat alternatives is growing as health and sustainability concerns drive more consumers to reduce their meat consumption. This report examines how the use of different methods can push the boundaries of innovation, offering numerous opportunities in improving the profile of meat alternatives. It also addresses the challenges that the sector faces and highlights the factors that can accelerate the consumption of fermentation-derived alternatives.
- Consumers are increasingly looking at meat alternatives as a healthier and more sustainable alternative to meat. Alternative proteins can help feed a growing world safely and efficiently, and will be as essential to mitigating climate change as the global transition to renewable energy.
- Although the number of vegans and vegetarians in the world remains small, there is an increase in the number of flexitarian consumers looking to cut down their consumption of meat.



Source: ACCIÓ, based on Euromonitor

What is alternative protein? (I)

Alternative proteins are proteins produced from **plant or animal cells**, or through **fermentation**.



Alternative proteins include **microbial** proteins, **insect base** proteins, the so-called **lab-grown meat**, substitutes of **meat of vegetable origin** and **dairy alternatives**.

Alternative proteins are **alternatives of vegetable origin and food technology** to animal proteins. They include food products made from plants (e.g. grains, legumes and nuts), fungi (mushrooms), algae, insects and lab-grown meat.



Alternative proteins are a revolutionary approach to **diversifying dietary protein sources** beyond conventional options derived from animals.

What is alternative protein? (II)

Plant-based



Fermented meat



Lab-grown meat



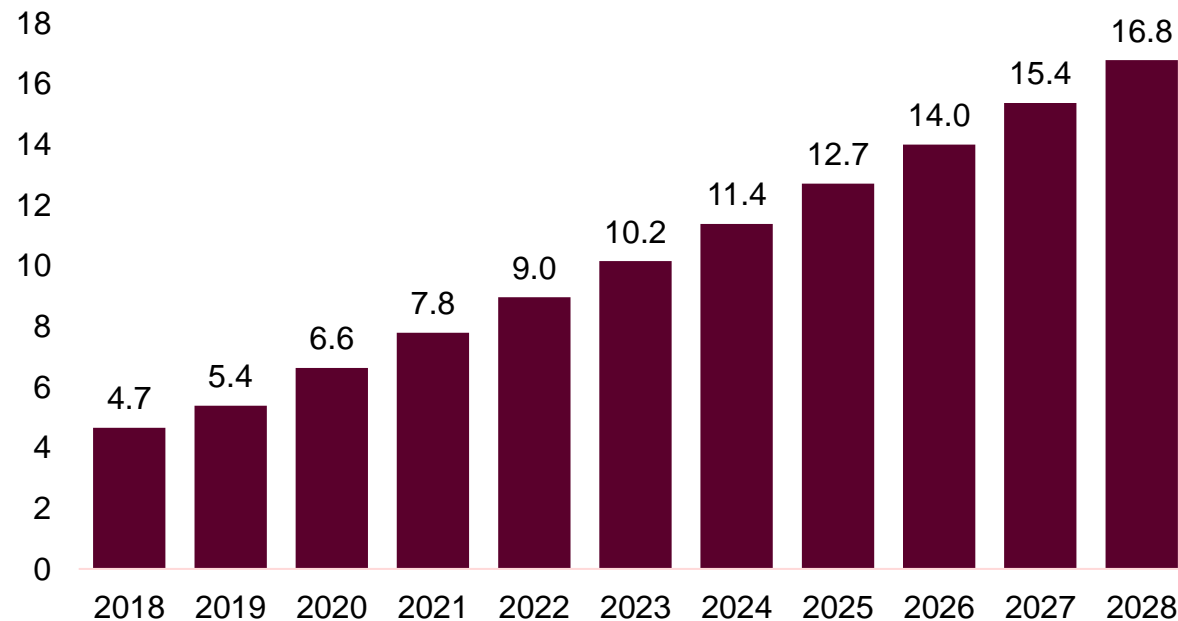
Alternative protein: a booming market I

Global plant-based meat market revenue 2018-2028

- Despite the economic uncertainty of recent years, a **positive outlook for the plant-based sector** is expected thanks to various factors that are expected to persist despite the recent disruptions.
- Sustained consumer demand, growth in emerging markets and innovative product improvements are the main factors.



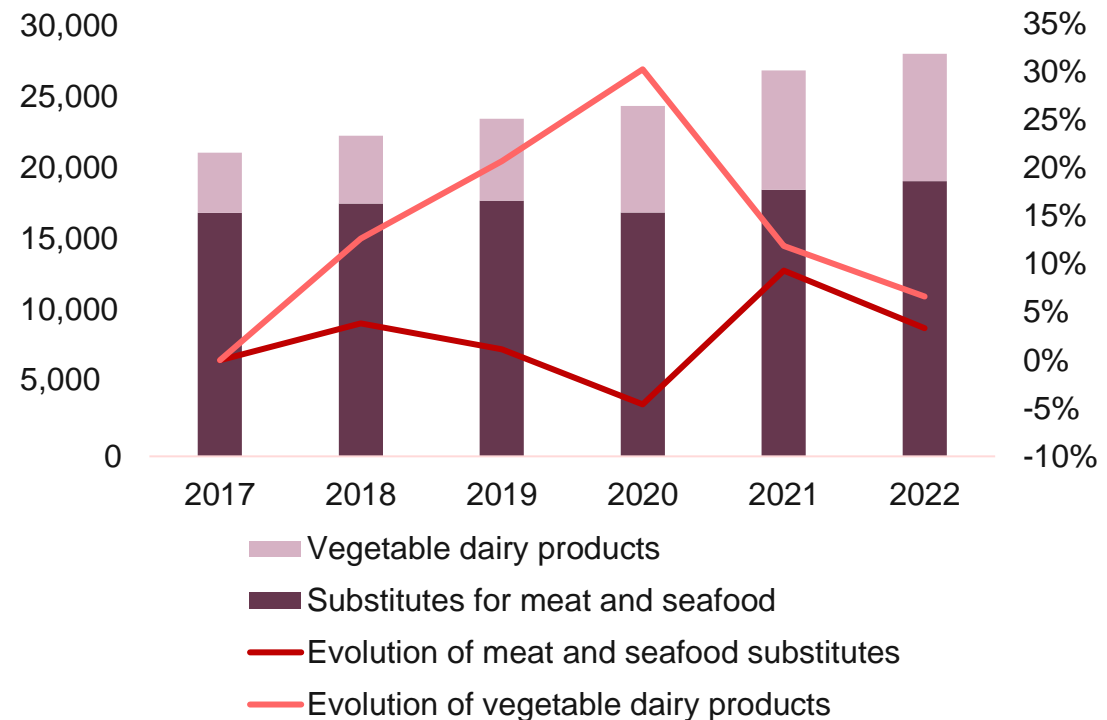
Revenue in millions of dollars



Alternative protein: a booming market II

Global sales and growth 2017-2022 (\$M)

- Global sales of alternative protein are trending upwards, **having risen from \$21,000M in 2017 to over \$27,000M.**
- Plant-based food represent a large part of the meat substitute products.** Other alternatives, such as insect protein, grown or produced in laboratories, are still in research phases and are starting to be commercialized in some countries. (EY)
- The most predominant segment within dairy products is that of vegetable milks. Soy milk is the largest component of plant milk sales, but sales declined in 2020, mainly due to pandemic restrictions in China.

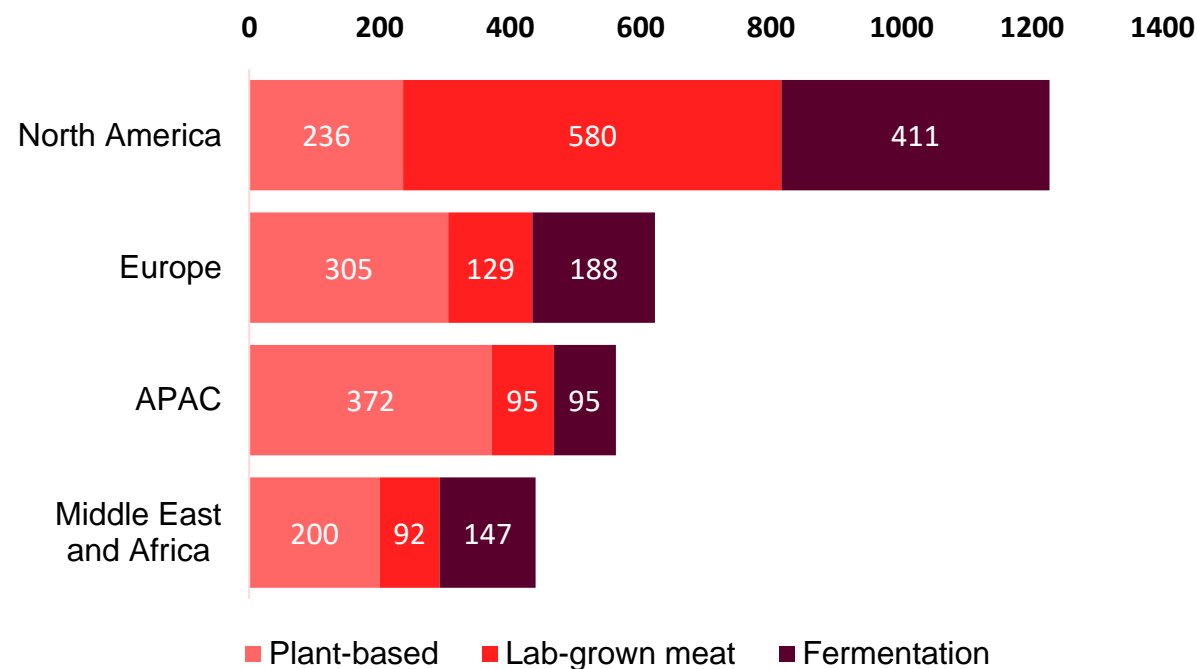


Source: ACCIÓ, based on the report titled “Facing Plant-Based Challenges: Health, Price and Taste” drawn up by Euromonitor

Europe, the second region with the largest investments in alternative protein

Investments in alternative sources of protein sectors in 2022, by region

- In 2022, **North America was the leading region for investments in alternative protein sources**. The highest investments were in the lab-grown meat sector.
- Europe** and in the APAC region, **investments were high in the plant-based sector** with 305 and 372 million dollars, respectively.
- The Middle East and Africa were the regions that received the least investments in these sectors. Currently, the plant-based sector is starting to develop in some pioneer countries such as the United Arab Emirates or Egypt.



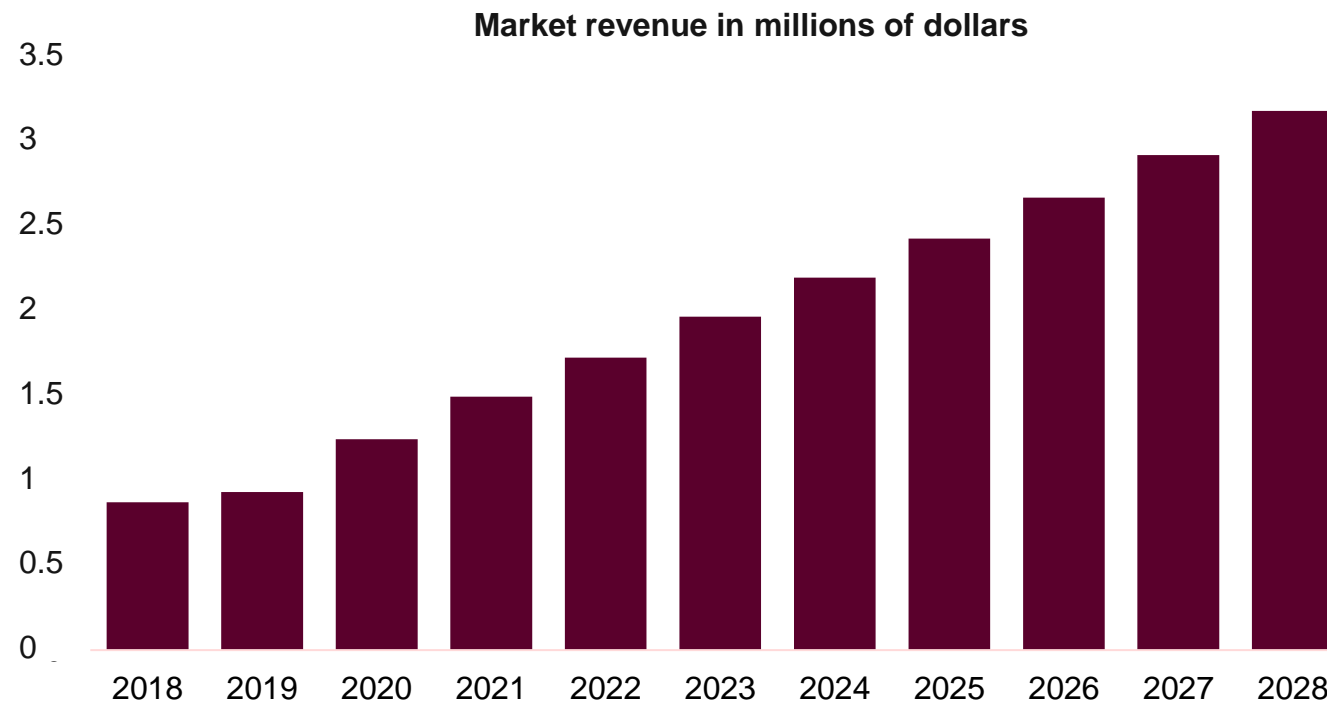
Investment in millions of dollars

Source: Statista

Alternative protein revenues rise in the European market

Revenue of the plant-based meat market in the European Union (EU-27) 2018-2028

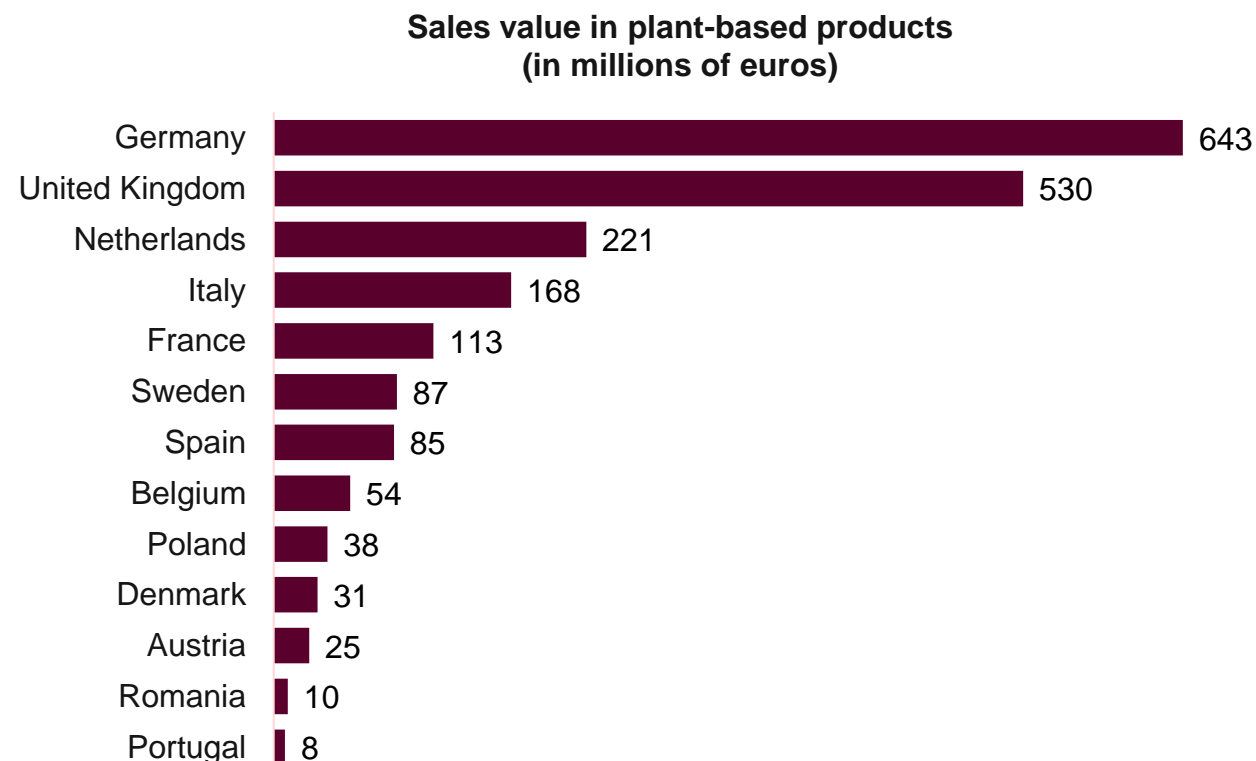
- In 2023, the market revenue generated by meat substitutes in the European Union (EU-27) amounted to about US\$ 1.96 billion. By 2028, this amount is expected to exceed three billion dollars.



Germany and the United Kingdom lead the plant-based product market in the European Union

Plant-based product market size in some EU countries, 2022

- The countries with the **most relevant markets** of meat substitutes of vegetable origin within the European Union are **Germany and the United Kingdom**, with sales of approximately 643 million and 530 million euros, respectively.

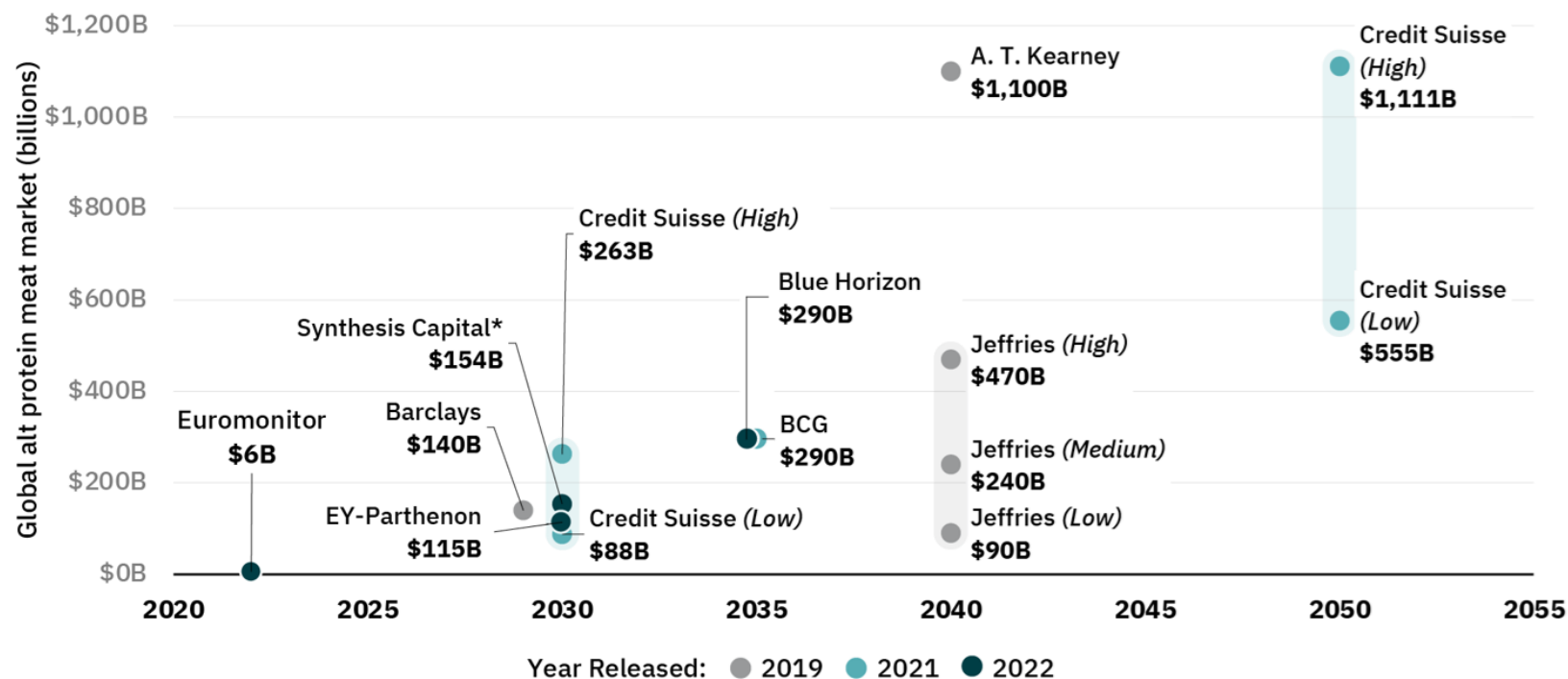


Source: Statista

The overall outlook for the future of alternative proteins is positive

Published market forecasts of the alternative protein industry by year

- In the forecast of the experts, there is a consensus that the **global alternative protein market will grow to around \$100-150 million by 2030**, and by 2035 or 2040, it will become a \$250-300 million market.



Source: The Good Food Institute

The United States leads global investment in alternative protein

The **volume of FDI in the alternative protein industry** totaled €6.4 billion in the historical series, with a total of 195 projects that have employed 17,808 people. Catalonia is the 14th worldwide and 4th in Western Europe in receiving this FDI.






Alternative protein FDI in the world, 2014-2023

195 projects

6,4 B€ in investment

17,808 jobs

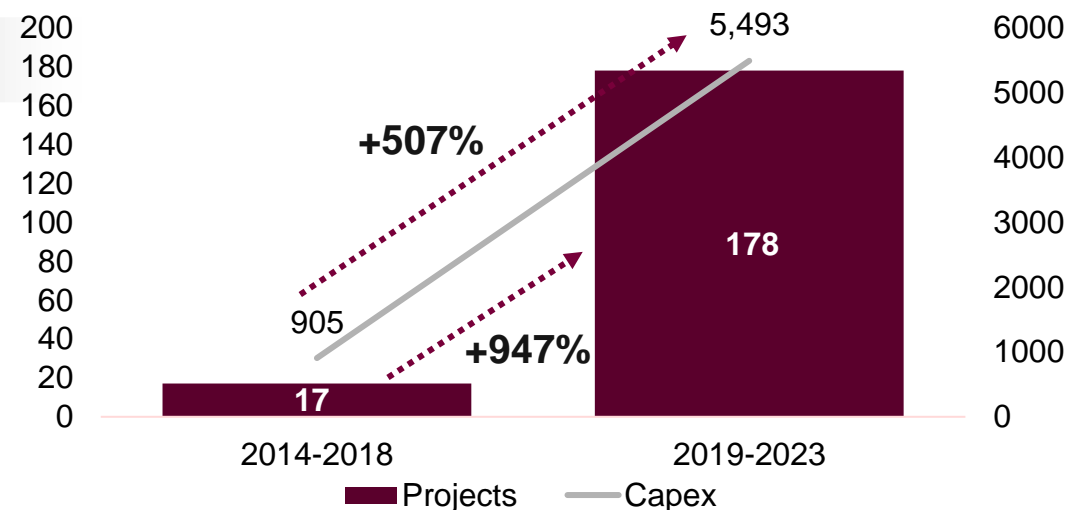
Countries of origin by projects

-  1 United States | 30 projects
-  2 United Kingdom | 20 projects
-  3 France | 17 projects
-  4 Switzerland | 15 projects
-  5 Germany | 11 projects

Destination countries by projects

-  1 United States | 47 projects
-  2 The Netherlands | 26 projects
-  3 Canada | 12 projects
-  4 China | 12 projects
-  5 United Kingdom | 12 projects
-  14 Catalonia | 3 projects

Evolution of FDI of alternative protein



Note: Projects in the “Alternative Proteins, Cultured Meat, Edible Insects, Plant-based Foods, Vegan Industries” tags have been considered

Source: ACCIÓ, based on fDi Markets, 2024

Proximity to markets and consumers, as well as technology and innovation, are key factors for FDI in alternative protein

The 10 top investing companies



Motives and determinants

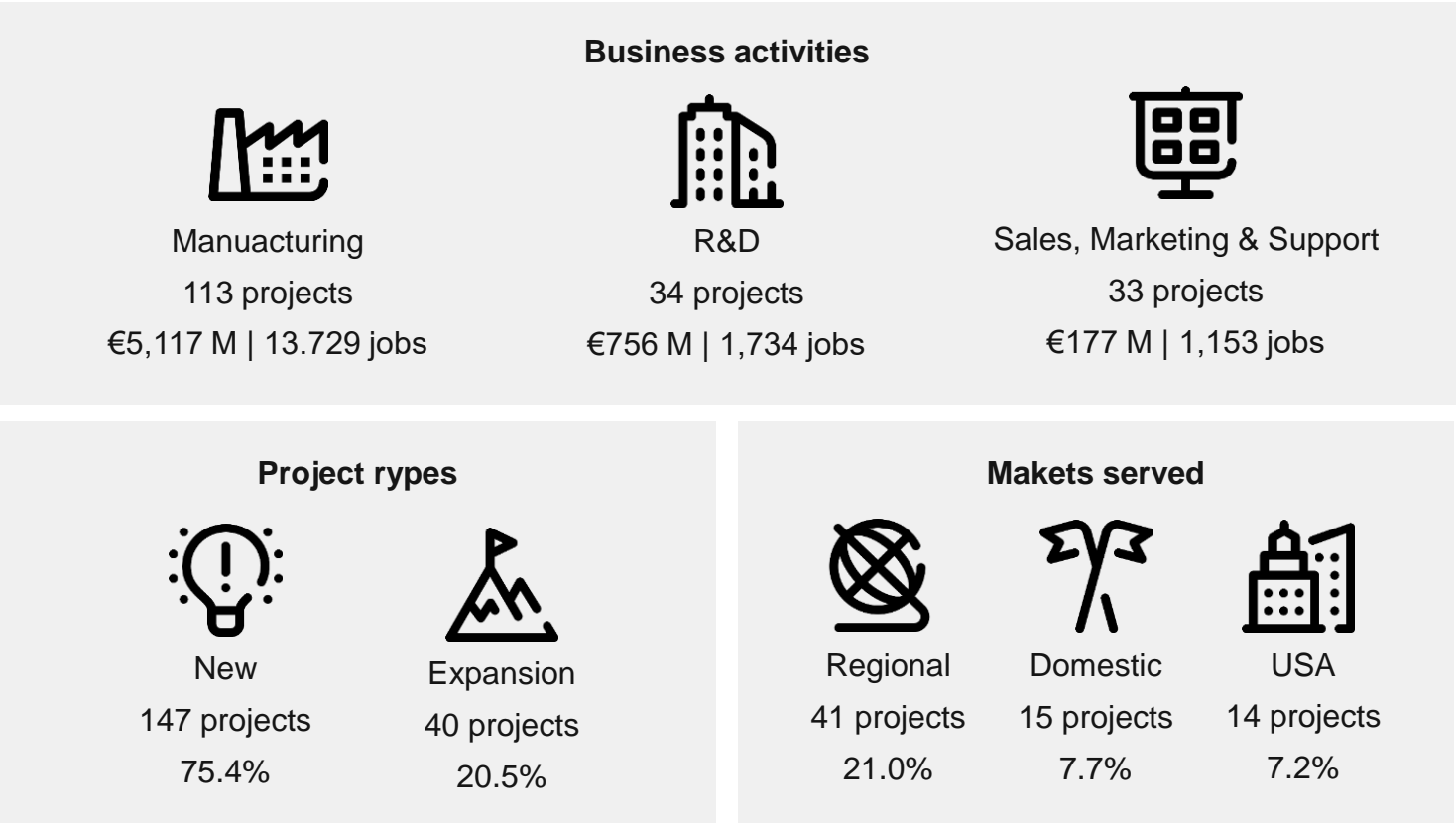
Proximity to markets or customers



Technology & innovation



FDI Profile in Alternative Protein



Note: Projects in the “Alternative Proteins, Cultured Meat, Edible Insects, Plant-based Foods, Vegan Industries” tags have been considered

Source: ACCIÓ, based on fDi Markets, 2024

2. Reasons for the growth of this sector

The rapid growth of this sector in recent years is due to three main factors



Food safety



Health



Environment

Alternative proteins as a solution to food insecurity



- The UN estimates that around **783 million people suffer from chronic hunger**.
- It will be necessary to produce **70% more food** than what is currently produced **by 2050**.
- Alternative proteins require less inputs, have shorter and more adaptable supply chains, and can be made in environments not capable of sustaining animal agriculture.

FOOD SECURITY

Alternative proteins will transform food, mitigate climate change and drive profits.

WORLD
ECONOMIC
FORUM



Alternative proteins support global food security

Mitigating Risk and Capturing Opportunity: The Future of Alternative Proteins

CSIS | CENTER FOR STRATEGIC & INTERNATIONAL STUDIES

Source: The Good Food Institute and UN

A healthier diet is possible thanks to alternative proteins



- According to the Global Burden of Disease Study, the main risk factors for disease are linked to diet.
- WHO declares that the **excessive consumption of meat** can affect **negatively to health**.
- Meet the current demand for meat by making it from plants or growing it from animal cells **reduces the risk of antibiotic resistance and pandemics**.

Research article



- In 2023, the American Journal of Clinical Nutrition published a study demonstrating a **close relationship between excess consumption of red meat and the risk of developing type 2 diabetes**.
- The study emphasizes the benefits of **meat**, claims that it is a very powerful source of vitamins and proteins, but warns that **cannot be consumed excessively**.
- The study states that part of the nutrients and proteins provided by red meat can be extracted from other sources of protein and **recommends a diversified diet**.

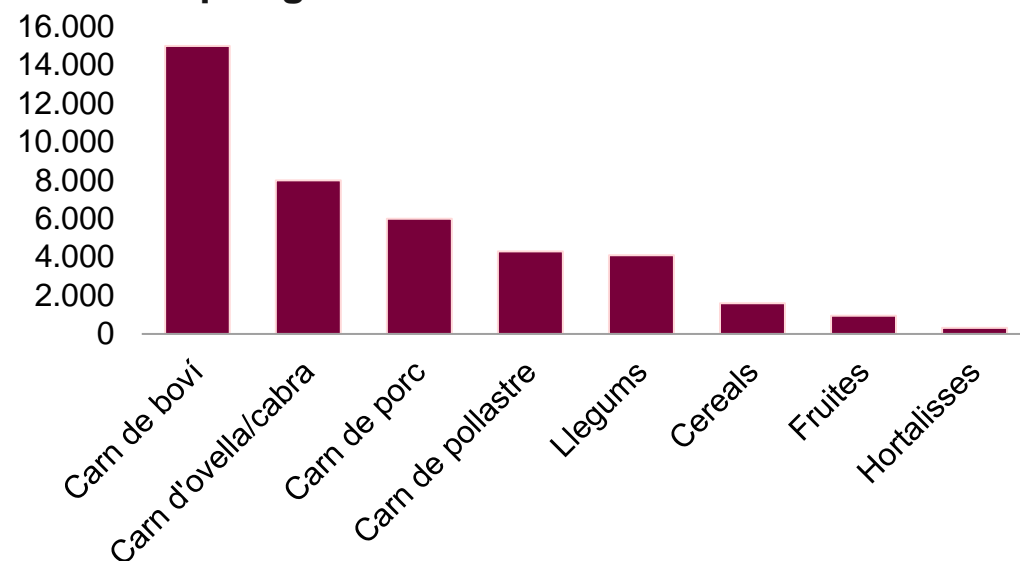
Source: American Journal of Clinical Nutrition and WHO

The introduction of alternative proteins can reduce the current environmental impact



- The **food industry** represents **35% of current world emissions** of greenhouse gases (GHG).
- **Alternative proteins** can **reduce the environmental impact** of the food system, conserving land and water, and minimizing greenhouse gas emissions.
- Consuming alternative proteins can keep our air and water clean, improving the health of communities and ecosystems.

Litres d'aigua necessaris per produir un quilogram dels aliments seleccionats



It takes 15,000 liters of water to produce a kilo of meat and 1,500 to produce a kilo of cereals.

Source: The Food Tech

Source: El Economista and The Good Food Institute

Alternative proteins could reduce more than 80% of carbon emissions

The sustainability of alternative protein

Plant-based

- Emits up to 90% less GHG emissions
- Uses up to 99% less land
- Uses up to 99% less water

Fermentation

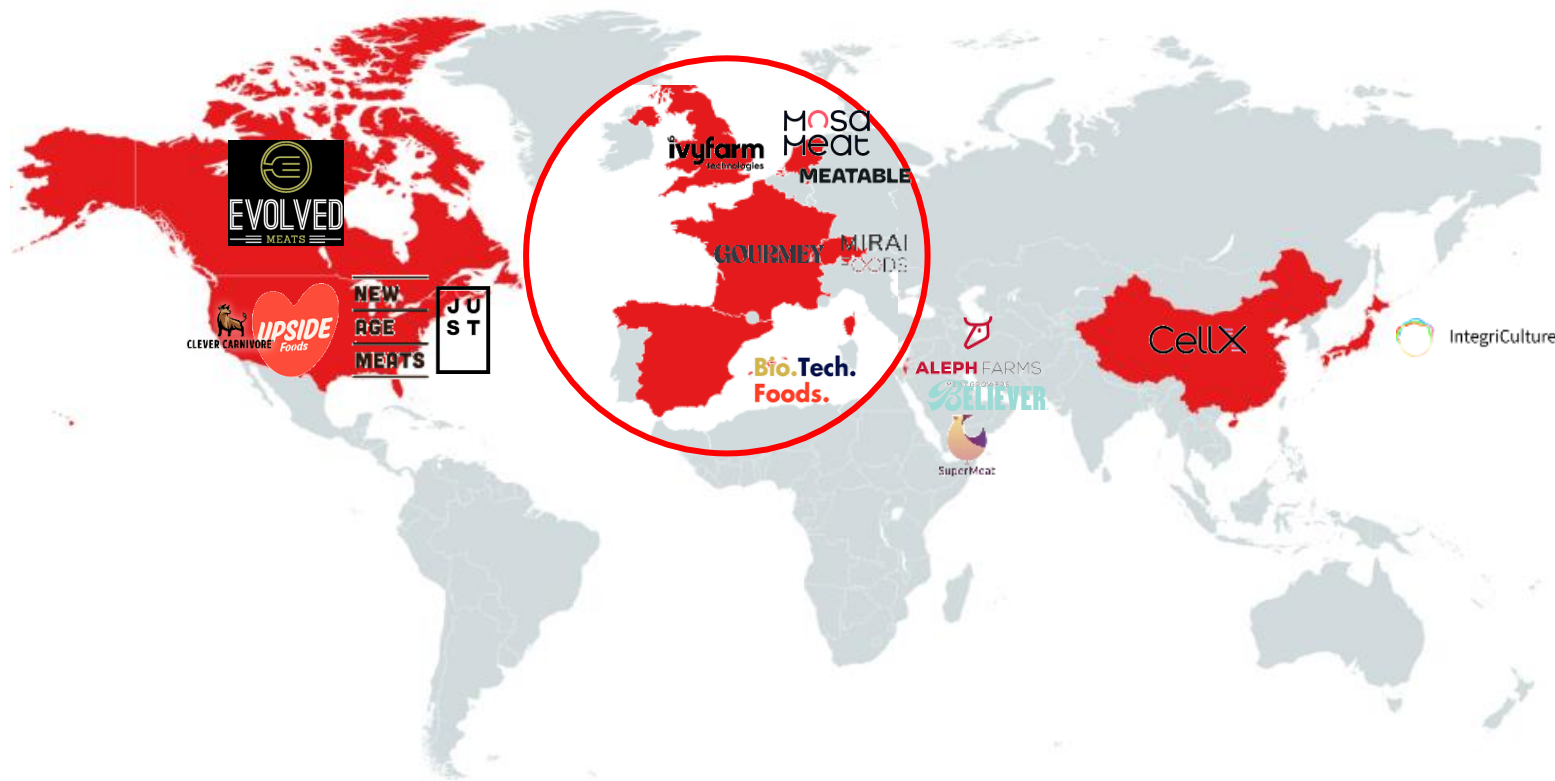
- Emits 90-96% less GHG emissions
- Uses up to 98% less water

Cell culture

- Rough estimate:
- 92% less GHG emissions
- 95% less land
- 93% less air pollution

3. Top Alternative Protein Companies Spotted in the world

Main companies producing lab-grown meat



On a global scale...

The consulting firm McKinsey estimates that the market of **lab-grown meat** will reach a value of **\$25 billion dollars by 2030** — 22,836 million euros—.

On a regional scale...

The Basque company **BioTech Foods** has started the construction of what will be the **largest lab-grown meat plant in southern Europe**. The construction of the plant will mean an investment of 41 million dollars and is expected to produce more than a thousand tons of lab-grown protein per year.

Main companies of fish products and dairy products

Main fish product companies



Main dairy product companies



Main success stories of plant-based companies

IMPOSSIBLE™



Impossible foods Inc. It is a company that develops vegetable substitutes for meat products. Its flagship product is the Impossible Burger, a plant-based hamburger that mimics the taste of meat. The *Impossible Burger* was launched in 2016 and is currently served in more than 17,000 restaurants.



BEYOND MEAT™



Beyond Meat Inc. is a company that produces plant-based meat substitutes. The company offers a wide range of plant-based options, including burgers, sausages, meatballs, empanadas and beef, poultry and pork *crumbles*. Currently, its products are supplied to a total of more than 50 countries.

Quorn™



Quorn is the leading vegetable microprotein brand in the UK, Ireland and the Netherlands. The microprotein they produce is extracted from a fungus, *Fusarium venenatum*, which is grown in large fermentation tanks in laboratories. They currently export their products to more than 20 markets.

Sunfed™



Sunfed Meats is a plant-based meat manufacturing company. The main goal is to produce protein-rich meat substitutes. It offers vegan products made from yellow peas. It currently sells its products in Australia and New Zealand.

Source: ACCIÓ based on the websites of these companies

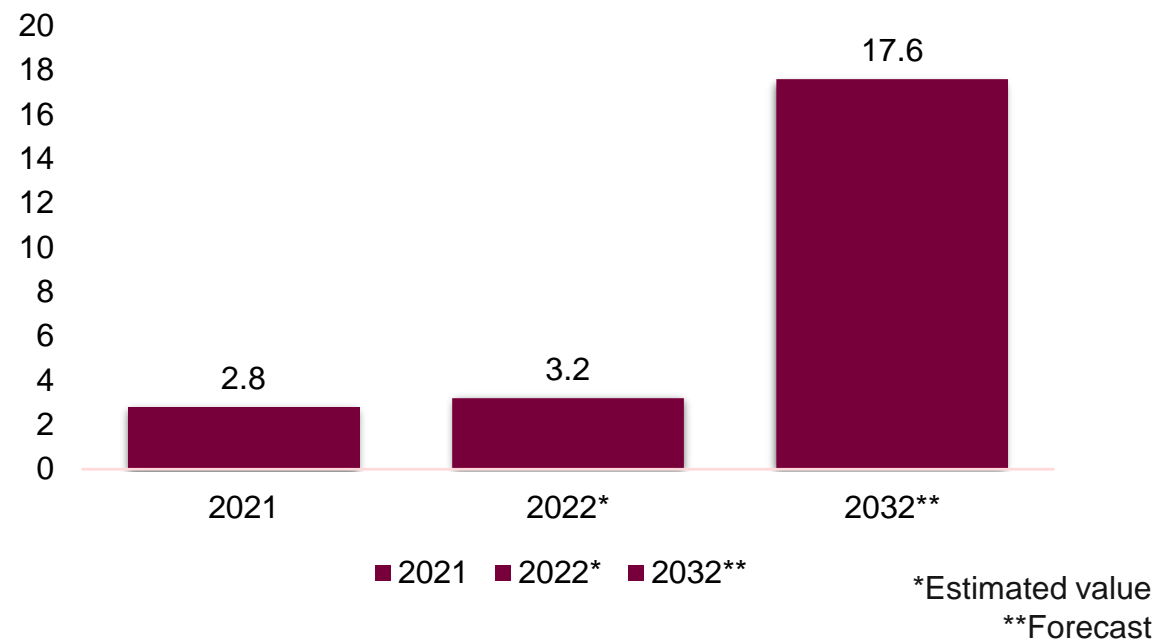
Insect protein is gaining weight in the alternative protein market

The consumption of insects: the diet of the future?

- Since 2013, **the United Nations Organization advocates for the consumption of insects** with the aim of fighting hunger in the world. The organization declares that insect protein contributes to a healthy and sustainable diet with the environment, and that at the same time, it can become a good substitute for carnivorous protein.
- According to the FAO, the consumption of insects is increasingly relevant, given the increasing cost and environmental impact of animal protein production, food insecurity in some parts of the world, and population growth.



Insect Protein Market Value 2021 – 2032 (in USD Billion)



Source: Spanish Agency for Food Safety and Nutrition and Statista

The alternative protein sector in Catalonia

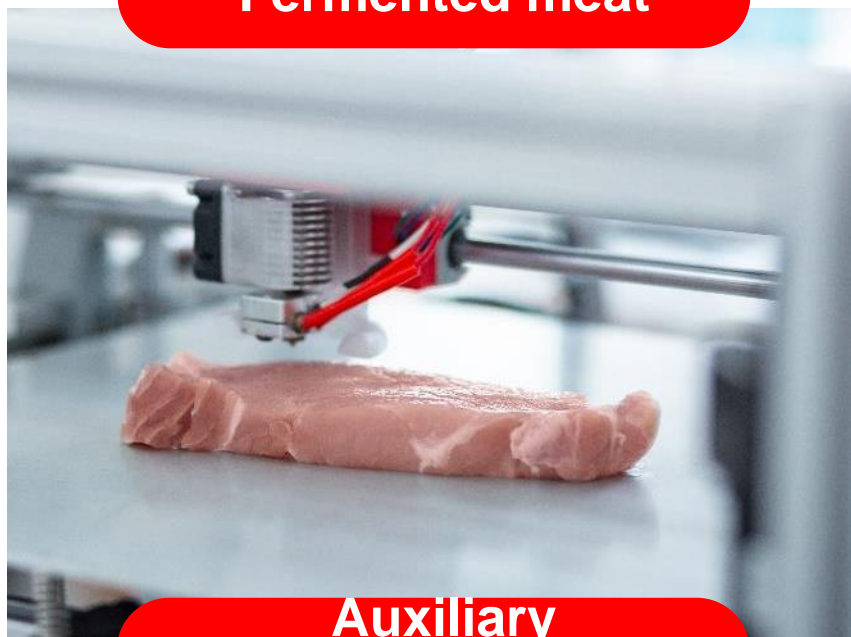
4. The alternative protein sector in Catalonia

Alternative protein categories

Plant-based



Fermented meat



Lab-grown meat



Auxiliary companies



Alternative protein categories: Plant-based

Plant-based meat is produced entirely from plants

- It is produced using plant-based ingredients such as protein, fat and carbohydrates to mimic the full sensory experience consumers expect from meat.



Source: ACCIÓ

Alternative protein categories: Fermented meat

Fermentation is an enabling technology for the alternative protein industry that allows the production of independent protein sources or functional ingredients

- Microorganisms, such as filamentous fungi and bacteria, can be programmed to express specific proteins or fats, or their entire protein biomass can be harvested.

Source: ACCIÓ



Alternative protein categories: Lab-grown meat

Lab-grown meat is produced directly from animal cells.

- Growing meat facilitates the same biological process that occurs inside an animal by providing the cells with the heat and basic nutrients needed to build muscle and fat.

Source: ACCIÓ



Alternative protein categories: Auxiliary companies

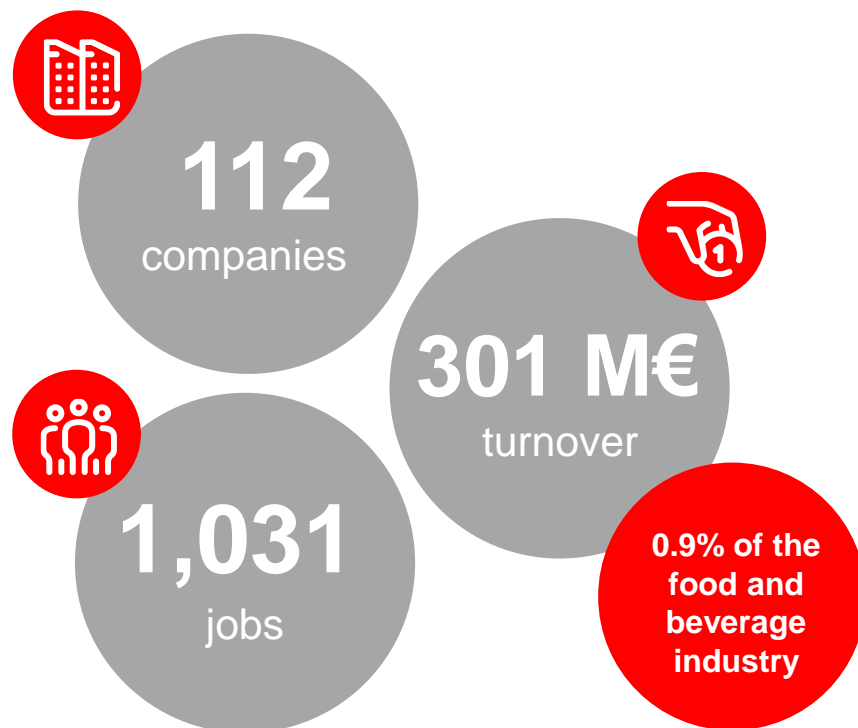
Group of companies that provide support and complementary services for the creation and manufacture of the alternative protein.

- It includes companies that develop ingredients to mimic the taste, aroma and texture of meat, as well as the machinery and equipment needed to process these foods. It is a multidisciplinary field that covers everything from biotechnology to food engineering.

Source: ACCIÓ



Summary of the alternative protein sector in Catalonia



Note: the companies identified as part of this study have a business line related with alternative protein; the potential identification of companies able to work in the area of alternative protein is expected to grow exponentially in the coming years

Source: ACCIÓ



Key data for the alternative protein sector in Catalonia

112 companies



- **70.5%** of the companies are SMEs (with a turnover of less than €50M).
- **33.9%** of the companies were established less than 10 years ago.
- **79.5%** of the companies are exporters and **51.9%** are regular exporters.
- **14.3%** of the companies are branches of foreign companies.
- **20.5%** of the companies are startups.

Regional distribution



- **62.2% of companies are located in the Barcelona area.**
- **82.8%** of total turnover and **86.4%** of the total number of people employed in the sector are from companies from the province of Barcelona.
- **Barcelonès, Vallès Oriental, Baix Camp, Vallès Occidental and Baix Llobregat** are the districts with most companies related with alternative protein.

Turnover: €301 M



- Representing **0.9%** of the turnover of the food industry in Catalonia.
- The turnover of the major companies (**29.5%** of all companies) accounts for **66.5%** of the total turnover for the sector.

1,031 people employed



- **29.2%** work in young companies (10 years old or less).
- **42.3%** work in large companies (over 50 employees).

Top companies by alternative protein product (I)

Companies producing alternative protein

Meat

Pure players



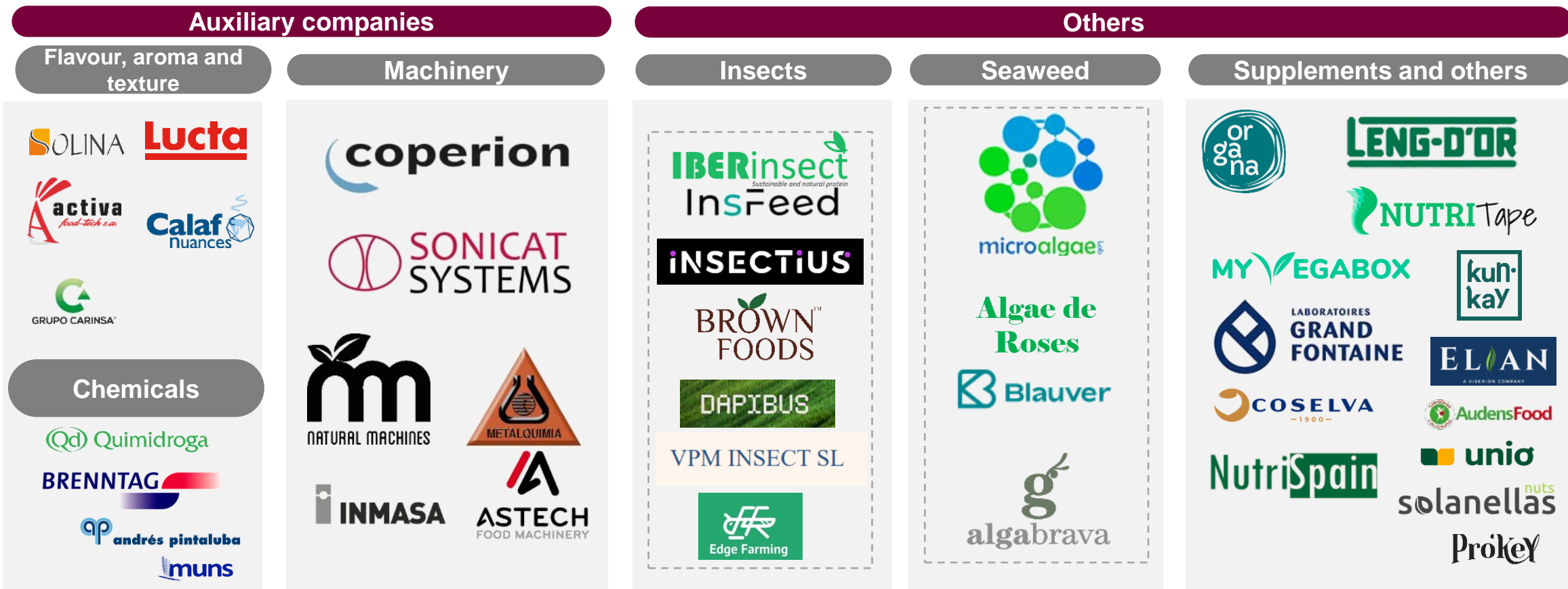
Dairy



Note: partial representation in order to illustrate the value chain suppliers of the alternative protein sector in Catalonia, although there may be other companies not included in the study — **Note:** the companies dealing in exclusive in alternative protein (“pure players”) are boxed

Source: ACCIÓ

Top Companies by Alternative Protein Product (II)



Note: partial representation in order to illustrate the value chain suppliers of the alternative protein sector in Catalonia, although there may be other companies not included in the study — **Note:** the companies dealing in exclusive in alternative protein (“pure players”) are boxed

Top-level Catalan support ecosystem [...]

Business organisations and associations



Clusters



Research & knowledge



Trade fairs and congresses



Transfer platforms and incubators



Public policies and public development instruments



Universities



Note: partial representation to illustrate the value chain suppliers of the sector sector in Catalonia, although other companies may exist that are not included in the study.

Latest news from the alternative protein sector in Catalonia

The Department of Climate Action and IRTA promote the CiPA, a pioneering center in research and innovation on alternative proteins

The objective of CiPA is to promote the sustainable production of food and feed in Catalonia, valuing alternative sources of protein for animal and human nutrition. The new Alternative Protein Innovation Center promotes research and technology related to co-products, by-products, waste and surplus from the agri-food sector.

Ingal will develop an alternative protein plant in Alcarràs

INGAL Enginyeria & Consulting is the awardee of the preliminary project for the creation of the first pre-industrial plant in the State dedicated to the extraction, production and transformation into alternative protein and open access to any of the hundreds of interested Spanish producers currently developing innovative lines of alternative foods to meat. The project represents a clear push for the development of food based on plant proteins and alternatives.



Source: IRTA and Diari Expansion

Corporate foreign investment projects in Catalonia



Expansion of the factory with a line of plant-based products for the brands Alpro, Activia, and Oikos.



midsona

Investment in Vegetalia is being increased to manufacture plant-based meat alternatives.



The Germany company dealing in fresh food ready to cook, which includes a plant-based range, is getting ready to open in Barcelona.



The Japanese multinational increases the potential of the nutraceutical product subsidiary Nutrition & Santé.



Natural Gourmet Foods opens a production and distribution plant for plant-based meat products.



Case studies in Catalonia



Heura®

Heüra, the Catalan plant-based protein

Heura Foods was established in Barcelona in 2017 and supplies **100% plant-based, Mediterranean products**, as they use top quality ingredients such as olive oil.

Their product range includes burgers, meatballs, strips, and nuggets, and they have recently launched sausages and chorizo. They are now **present in over 10 countries and continue to grow** at a fast pace.

ALTERVEGO
XARCUTERIA VEGETARIANA

Altervego, by the company La Selva, expands its plant-based range to include new products

The cured meat company from Girona is creating a new product line of plant-based charcuterie, under the brand name Altervego, with products such as chorizo, bacon or tapas.

**REAL
DEAL
MILK**

The Catalan company has succeeded in producing dairy products without cows by using precision fermentation.

Its goal is to create milk, cheese, ice cream and other dairy products that are identical to traditional ones in terms of their nutritional value and the consumption experience without having livestock's negative impact on the environment, animal welfare and human health.

International business opportunities in the alternative protein industry



Singapore

Innovations and technologies to increase food self-dependence.



Canada

Canada, a country seeking high-quality, sustainable and varied foods.



Netherlands

Alternative protein and healthy eating



Australia

Plant-based protein or an alternative to meat.



China

The evolution of the Chinese food industry constitutes an opportunity.



South Africa

Opportunities in the ingredients sector with added value and plant-based origins.



Estonia

Growing interest in the Mediterranean diet and organic products.



France

Disruptive solutions for the food of the future in France.

Note: main opportunities in the sector based on the 2023 Global Opportunity Index

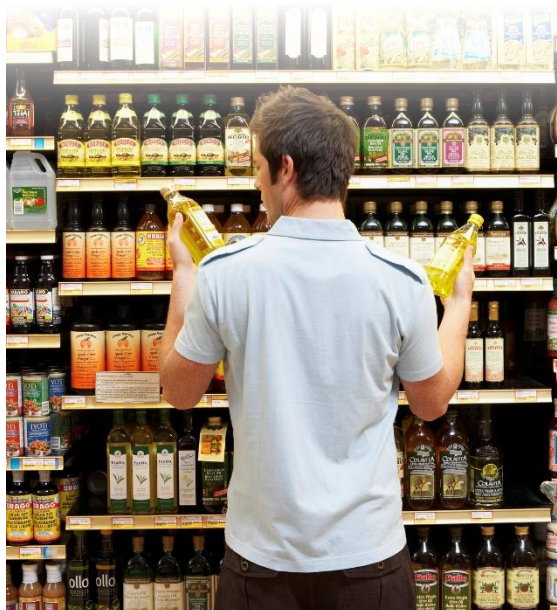
Source: ACCIÓ

The alternative protein sector in Catalonia

5. Future trends and opportunities in the alternative protein sector

The future of alternative protein in the global market

Main factors that will influence the market in the coming years



Consumer preferences



**Innovation and production
capacity**



**Geopolitical and regulatory
environment**



Climate action policies

Main factors that will influence the market in the coming years (I)

Consumer preferences

- Global increase in vegetarian and vegan population.
- The **generation z** is the one that is **more aware** and looking for more sustainable food options.
- The population of the United States and the European Union continues to reduce meat consumption while increasing plant-based foods, indicating a **greater demand in the future**.

Situation in Spain

- 4 out of 5 consumers have reduced their meat consumption
- 72% of consumers have increased their consumption of foods that replace proteins of animal origin

Current meat consumption versus two years ago in Europe

Level of consumption	2023
Much less	15%
Less	36%
Equal	39%
Little more	7%
Far more	2%

Source: Smart Protein Project

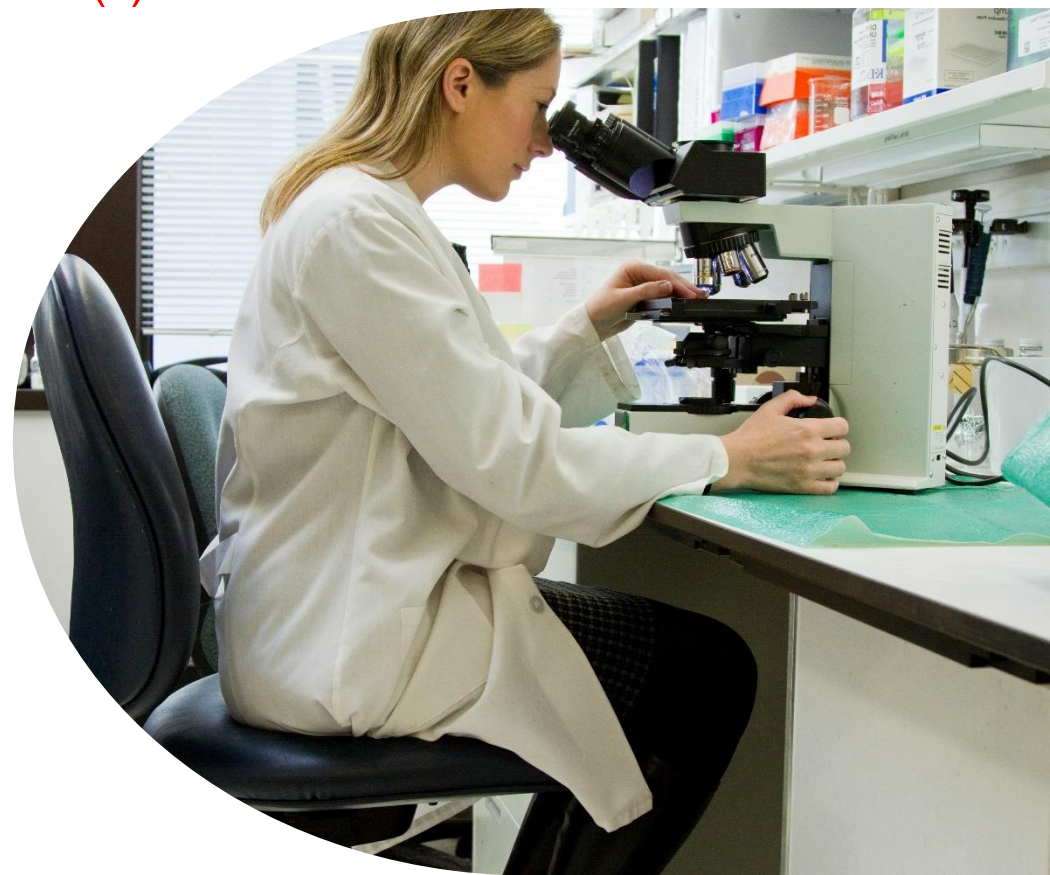
Source: EY and INDIA

CataloniaConnects

Main factors that will influence the market in the coming years (II)

Innovation and production capacity

- Major companies have reduced volume and production capabilities compared to traditional food companies. **To scale production is not viable yet.**
- Pending technological development to exploit the process of fermentation and cell culture.
- According to EY, the next technological impulse will have to **improve production efficiency and manage the reduction of costs, and improve the taste of the products**, which represent the main barriers for the consumption of these proteins.



Main factors that will influence the market in the coming years (III)

Geopolitical and regulatory environment



Geopolitics

- Experts predict that, in the future, globalization will recede and localization will become the trend.
- The alternative protein, not being so dependent on land, could be a key element for this future localization trend.
- Some governments are starting to include alternative proteins in their food security and sustainability agendas.



Normative

- Vegetable protein is currently widely consumed.
- First steps to regulate and authorize the production and consumption of lab-grown meat.
- On a European scale, most alternative protein products must go through an authorization process to be considered new foods (art. 3 of Regulation 2283/2015).

Main factors that will influence the market in the coming years (IV)

Geopolitical and regulatory environment: Regulation and public initiatives

United States:



It is working on a governmental regulatory framework to prepare the launch into general consumption. California became the first US state to invest in lab-grown meat research.

Singapore:



The sale of cultivated meat has been approved. In 2023, the company Eat Just is to open the largest factory in Asia to produce cultivated meat.

Japan:



The government is creating a commission to assess and establish the necessary health and legal regulations for the sale of cultivated meat.

China:



the 2022 five-year plan to develop the bioeconomy highlights the research, development, and production of synthetic proteins. The Ministry of Science and Technology launched a 93 million dollar R&D program that includes the manufacture of lab-grown meat

Qatar:



Eat Just is partnering with Qatari state agencies to build a \$200 million lab-grown meat facility, which would be the first in the Middle East.

Denmark:



In October 2021, the Danish government announced a \$177 million investment in plant-based foods.

The Netherlands:



The government has approved a €60 M subsidy for the development of the sector and gives its permission for sampling of cultivated meat.

Switzerland:



creation of the Cultured Food Innovation Hub. In 2023, Switzerland received the first request to market lab-grown meat.

United Kingdom:



The government wants to speed up regulatory approval of lab-grown meat. The aim is to reduce bureaucracy and eliminate unnecessary burdens for companies.

Main factors that will influence the market in the coming years (V)

Global climate action policies

ESG criteria (Environmental, social and governance)

Currently, investors bet on companies that have a business strategy that follows these criteria.

Environmental criterion: the company must cause a positive impact on the environment.

Social criterion: actions related to working conditions and human rights are included.

Criterion of good governance: Issues related to corporate quality, culture and company management processes are included.

2030 agenda - Sustainable Development Goals

The 2030 Agenda has 17 Sustainable Development Goals. 193 nations are committed to this initiative.

Main SDGs related to the food industry




**SUSTAINABLE
DEVELOPMENT GOALS**

Thank you!

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