

October 2023. 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

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Introduction

- 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. 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



The alternative protein sector in Catalonia

An overview of the alternative protein sector

Plant-based proteins and cultivated meat

The consumption of **plant-based foods** and **alternative proteins** is a **rising trend** among consumers worldwide. While the number of vegan or vegetarian consumers remains relatively low, **there is an increasingly large number of people who are attempting to reduce their consumption of animal products**, standing at 22.5% worldwide in 2021.

Types of alternative protein:

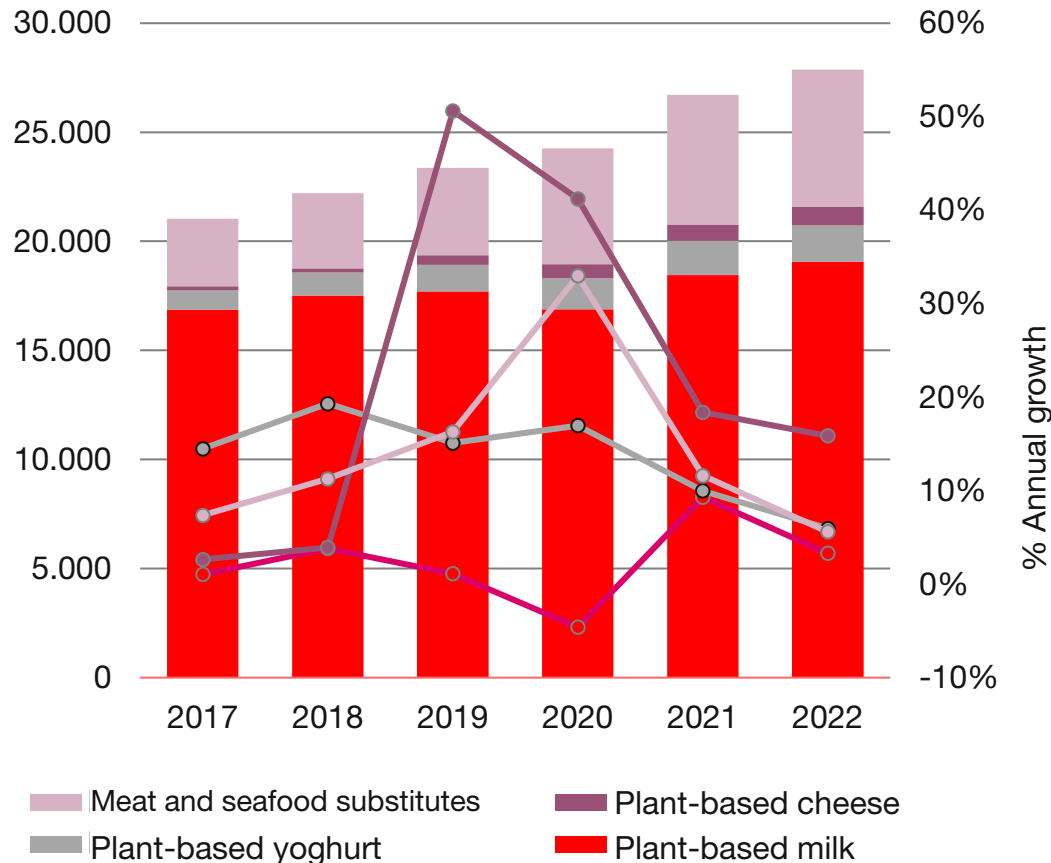
- **Plant-based meat analogues:** new ingredients and production methods emulate the taste, texture and behaviour of all types of meat product.
- **Plant-based milk analogues:** concern for the dairy industry's impact on the environment, along with health/digestion problems, has increased the consumption of dairy products (cheese, beverages, yoghurt, etc.) based on plants such as cashews, almonds, oats, and rice, etc.
- **Fish/seafood substitutes:** this segment is smaller than the above two but is growing and has great potential.
- **Cell-based cultivated meat:** meat cultivated in laboratories is an ethic and environmental requirement, as it involves less use of water/sun and respects animal rights.
- **New sources of proteins:** insects, mushrooms, algae, and micro-organisms.



Source: ACCIÓ, from the report “Plant-Based Eating and Alternative Proteins” by Euromonitor

A booming market

Alternative protein: Global retail 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 milks, which account for more than 65% of the global retail sales of alternative protein, displayed the lowest overall sales growth over the 2017-2022 period, largely due to the presence of soy milk in the category. Soy milk is the largest component of plant-based milk sales (with a 35% share in the key markets in 2022); it's a mature market in its key regions, such as Asia-Pacific, but it's slowing in others, such as the US, due to health and sustainability concerns. Sales declined in 2020, primarily due to the pandemic restrictions in China, which hurt sales of non-soy milk alternatives.

As for other products, plant-based meat and seafood substitutes, which account for more than 20% of global sales, displayed constant high annual global growth until 2022. Plant-based cheese was the typology of product that increased the most throughout the period (+400%).

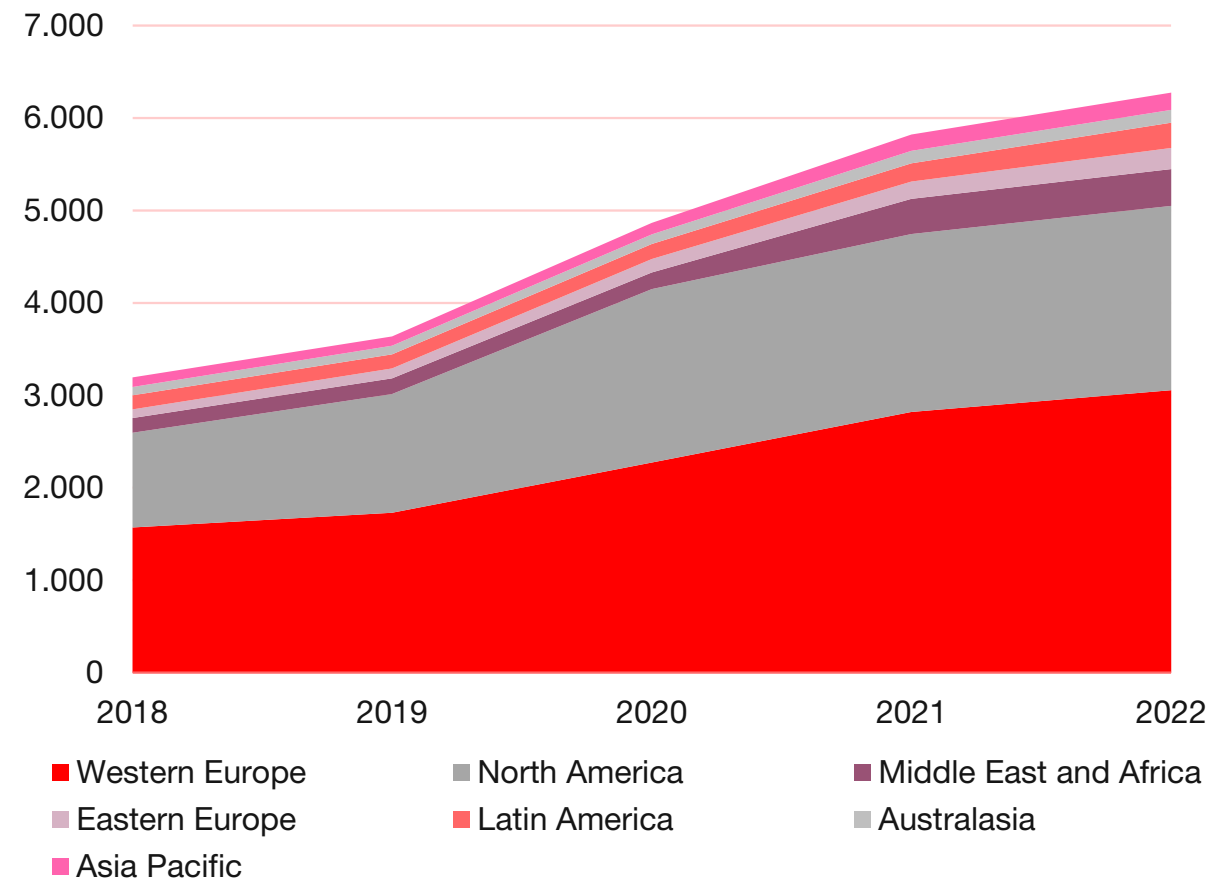
Source: ACCIÓ, based on the report titled "Facing Plant-Based Challenges: Health, Price and Taste" drawn up by Euromonitor

The alternative protein sector on a global scale

When looking at countries overall, the US is by far the biggest market for meat and seafood alternatives. However, when looking at regions, Western Europe accounts for almost half of total global meat and seafood substitutes value. The UK makes up 27.3% of this with a value of 842 M\$ in 2022. Growth is driven by increased new launches into this category. Germany is the second biggest market in Western Europe with a value of 672 M\$ in 2022. Again, the growing interest of consumers in following a flexitarian diet has resulted in an increase in both the number of brands and the diversity of products on offer.

Globally, the overall forecast CAGR for the category is 8.7% over 2022- 2027 (in USD constant terms). This is lower than the historic period, largely driven by a drop in sales in the US. There is still however, opportunity for growth in the category as it stabilises and the global economy, currently in a recession due to the war in Ukraine, recovers.

Meat and Seafood Substitutes by Region, 2018-2022 (M\$)



Source: "New Protein Frontiers: Fermentation in Meat Alternatives", Euromonitor
CataloniaConnects

Alternative protein as a tool to ensure the sustainability of overall calorie intake

The principles of sustainability and health make choosing alternative protein foods preferable. It is quite likely that, in the future, choosing alternative protein tends to become a necessity, given the incapability to supply the global demand for meat.

Use and pollution of protein

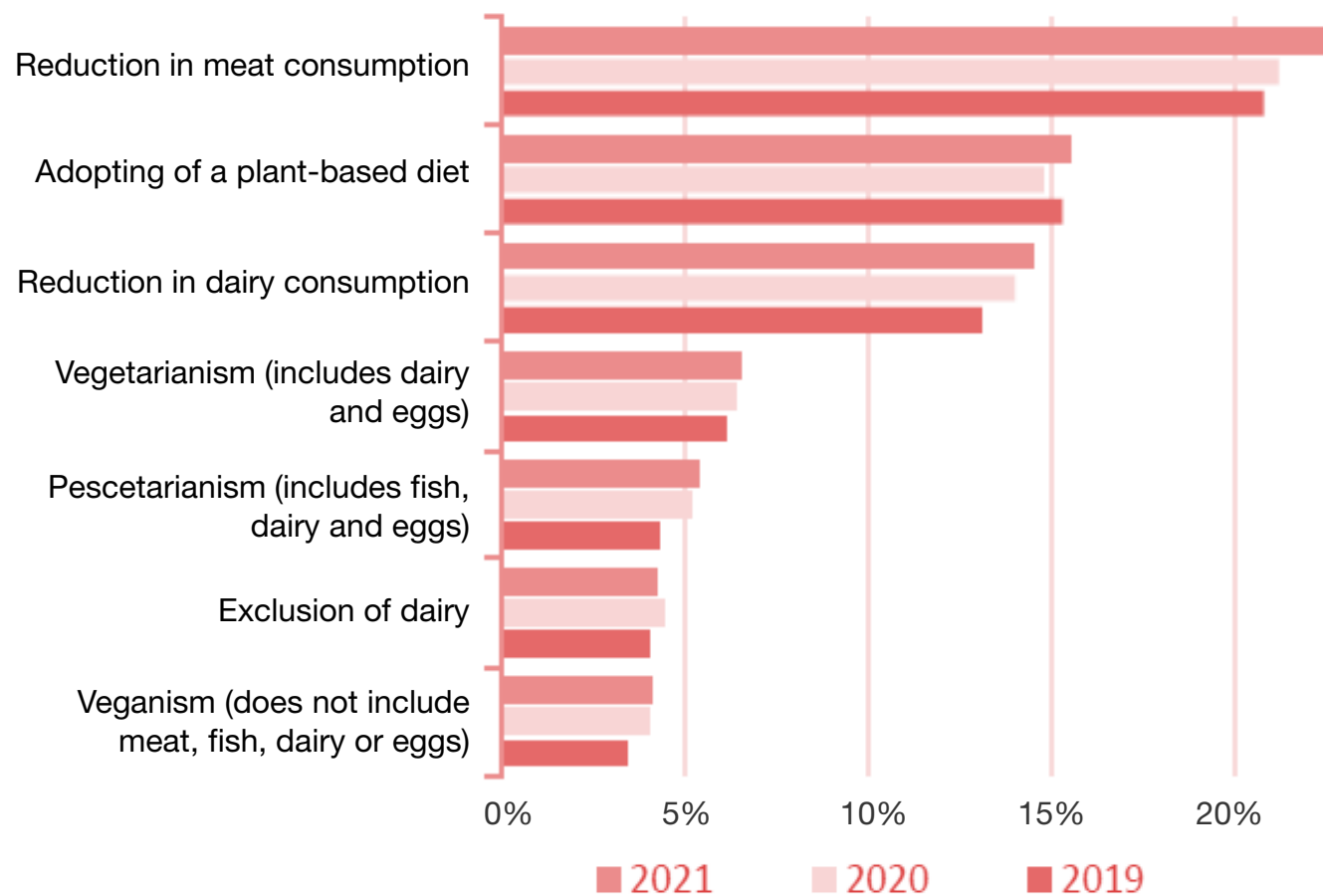
	Plant-based meat	Cultivated meat	Chicken	Pork	Beef
Use of land	1	x8	x23	x30	x44
Use of water	1	x28	x23	x20	x57
Air pollution	1	x10	x14	x20	x67
Greenhouse gas emissions	1	x6	x7	x12	x41



Source: ATKearney, "How Will Cultured Meat and Meat Alternatives Disrupt the Agricultural and Food Industry?."

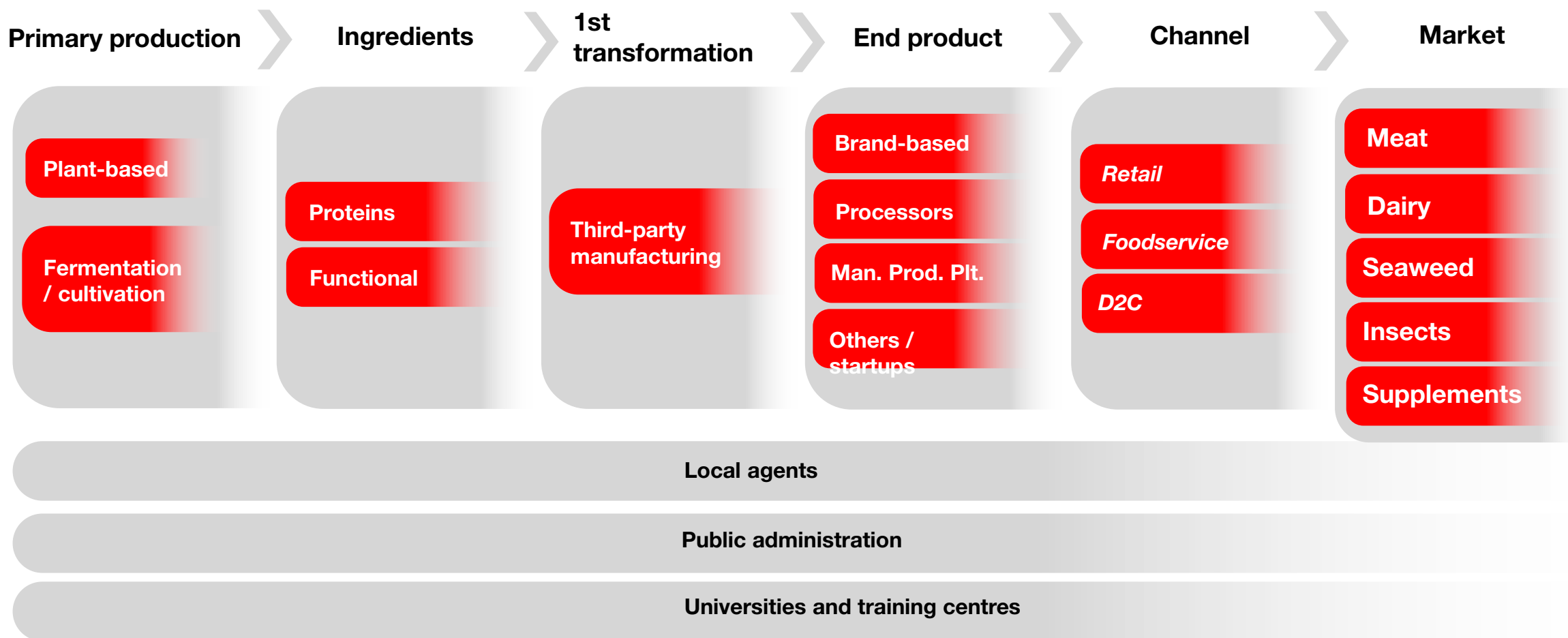
Reasons for diet restrictions among consumers worldwide

Evolution of the reasons between 2019 and 2021



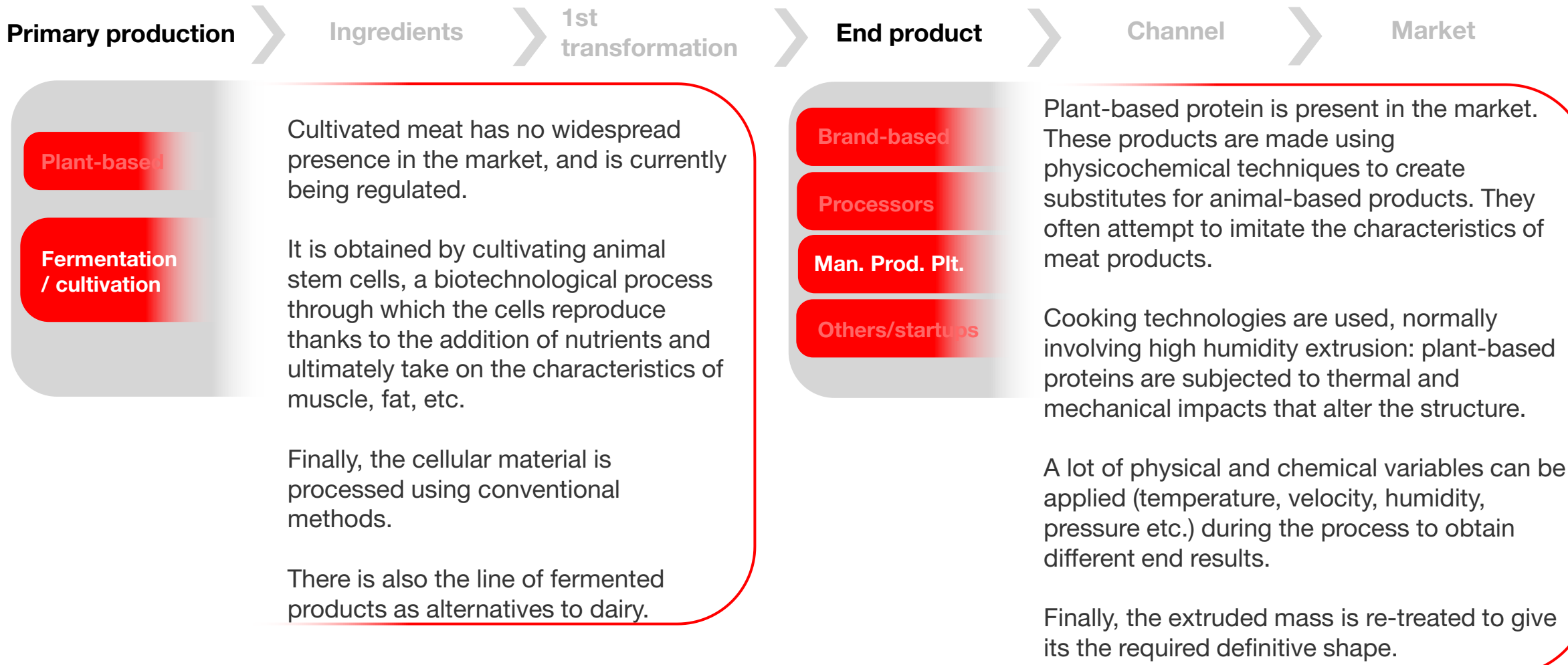
Source: The Good Food Institute

Description of the alternative protein value chain (I)



Source: Cluster Development

Description of the alternative protein value chain (II)



Description of the alternative protein value chain (III)



Plant-based

Fermentation / cultivation

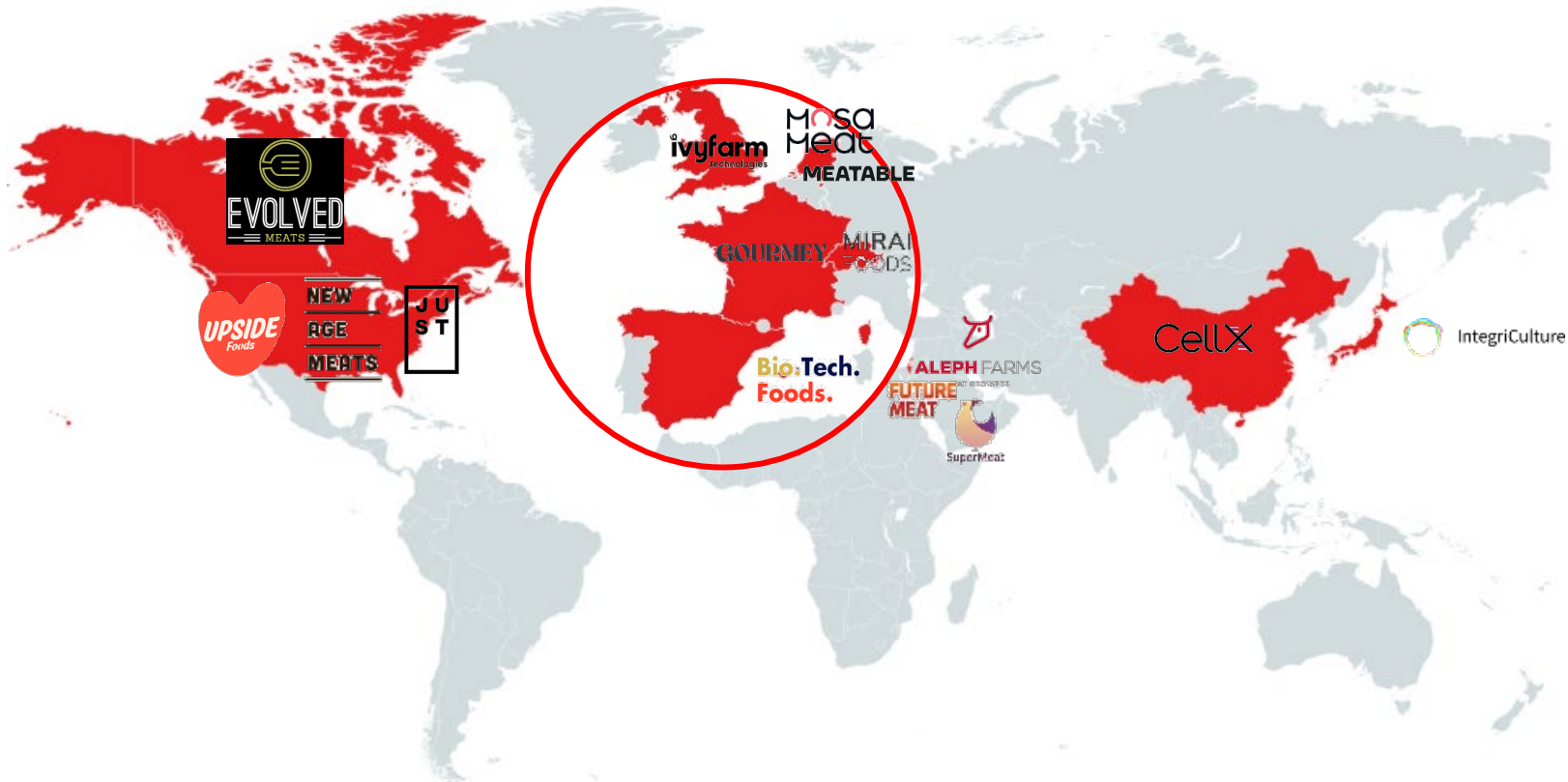
Traditional Fermentation is the “ancient” way of fermenting using live micro-organisms (eg yeast or fungi) to process plant-derived ingredients to result in a product that has a different flavour, texture and nutritional profile. This method is commonly used to make beer and cheese, yet is not commonly used by big brands of meat alternatives. Now traditional fermentation is being used to transform alternative proteins, to improve the flavour and or functionality of plant-based ingredients.

Biomass fermentation leverages the fast growth of micro-organisms that are inherently high in protein to produce large quantities of protein. The microorganisms that reproduce through this process are then used themselves as ingredients for alternative proteins. This method is used by UK-based Quorn Foods whereby filamentous fungi is grown via fermentation to use as the primary ingredient in their products. Biomass fermentation is a more affordable process than precision fermentation and it is easier to scale up.

Precision fermentation uses a process that recreates a specific functional ingredient that is naturally found in mammals and uses this to create alternative proteins. The directions on what to make are provided by strain engineering and the microbes are then cultivated in mass quantities. It is a more costly process and requires bio reactors of which there is a global shortage. Impossible Foods uses precision fermentation to produce its “heme” protein, replicating an iron molecule that gives meat its texture and flavour.

Main global companies in the fermentation/cultivation segment (I)

Main meat product companies



Work has begun on building the largest lab-grown meat factory in the world

The USA is to become the home of the largest cultivated meat factory in the world (Believer Meats). The company has invested over **\$123M** and will be able to produce around 10 million kg of meat a year.

This technology promises to radically reduce water consumption and the quantity of land and resources used in industrial or traditional livestock production. What is more, it is a way of obtaining animal-based protein that does not cause suffering and is more sustainable, as it generates less pollution and CO₂.

Source: Just Food

Main global companies in the fermentation/cultivation segment (II)

Main fish product companies

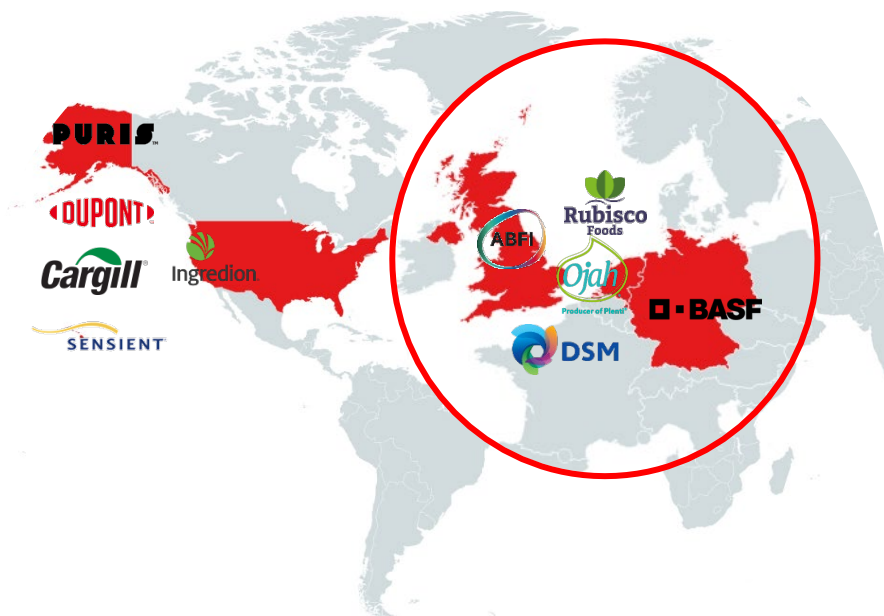


Main dairy product companies



Main global plant-based meat companies

Extraction of proteins and special ingredients



Brand names with in-house production

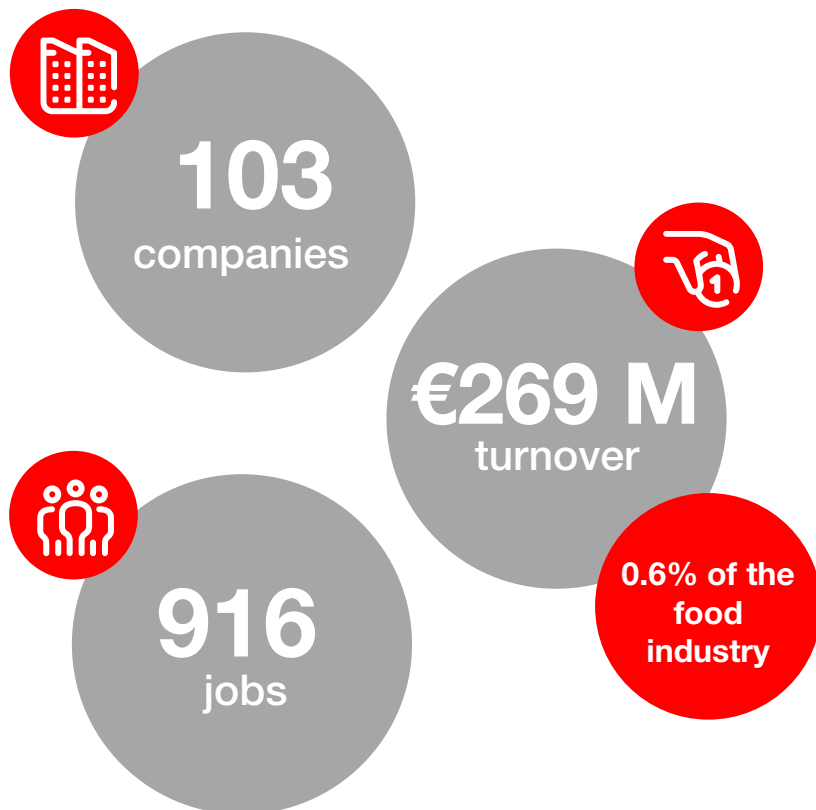


The alternative protein sector in Catalonia

The alternative protein sector in Catalonia



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

103 companies



- 68.0% of the companies are SMEs (with a turnover of less than €50M).
- 36.9% of the companies were established less than 10 years ago.
- 69.9% of the companies are exporters and 53.4% are regular exporters.
- 14.6% of the companies are branches of foreign companies.
- 10.7% of the companies are startups.

Turnover: €269 M



- Representing 0.6% of the turnover of the food industry in Catalonia.
- The turnover of the major companies (32.0% of all companies) accounts for 70.2% of the total turnover for the sector.

Regional distribution



- 64.1% of companies are located in the Barcelona area.
- 82.5% of total turnover and 83.8% of the total number of people employed in the sector are from companies from the province of Barcelona.
- Barcelonès, Vallès Oriental, Vallès Occidental, Baix Llobregat and Baix Camp are the districts with most companies related with alternative protein.

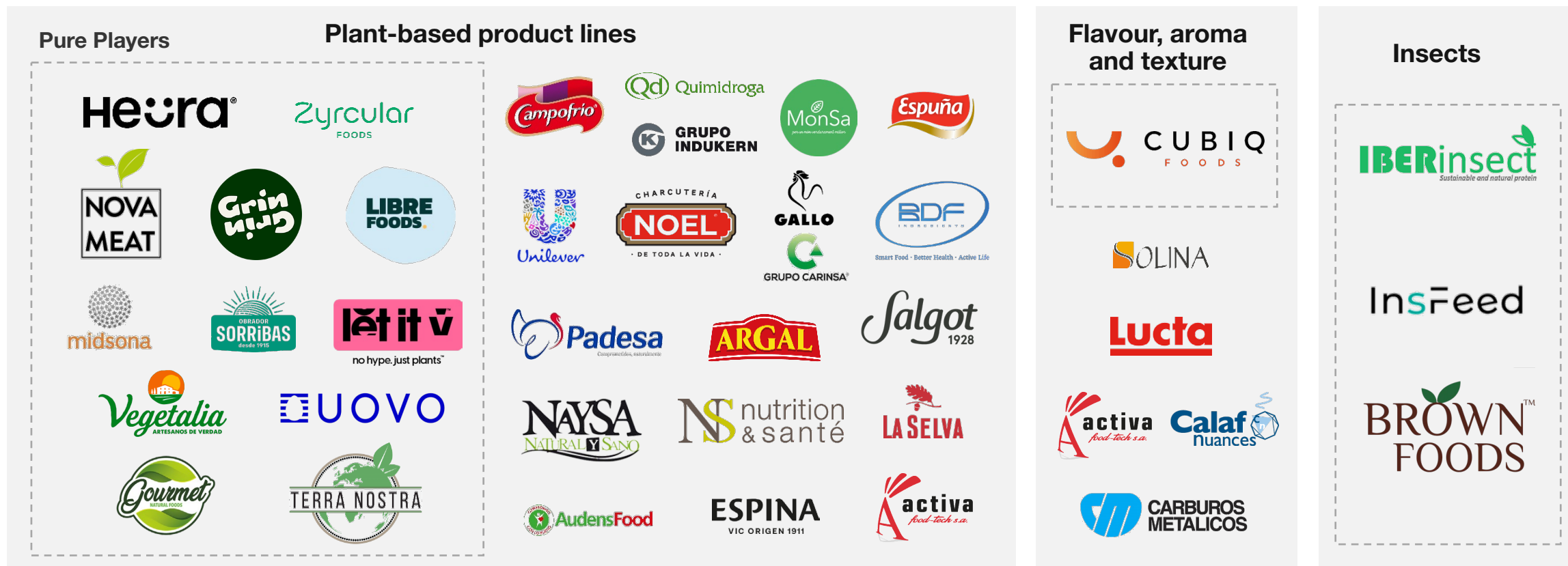
916 people employed



- 22.3% work in young companies (10 years old or less).
- 54.2% work in large companies (over 50 employees).

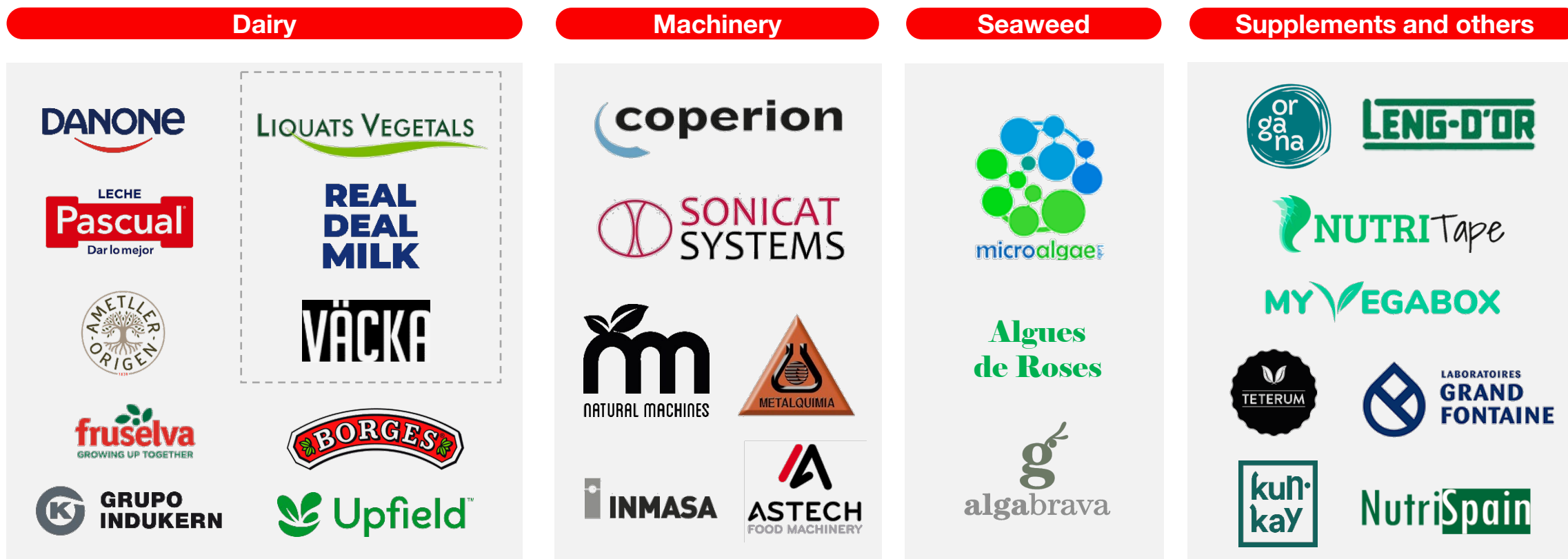
Ecosystem of plant-based protein companies (I)

Meat



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

Ecosystem of plant-based protein companies (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



Trade fairs and congresses



Universities



Clusters



Transfer platforms and incubators



Research & knowledge



Public policies and public development instruments



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

Source: ACCIÓ

CataloniaConnects

The alternative protein plan, a priority of the Next Generation funds

- **Catalonia has included the development of alternative proteins in the pack of 27 priority initiatives for the EU Next Generation funds.**
- The project has various areas linked to different points of the value chain: from the promotion and preservation of phyto-genetic resources (more specifically, the varieties of local legumes), to the manufacture of the end product, and production plants of concentrates and textured proteins.
- The initiative includes universities, research centres, business clusters, and companies wanting to make Catalonia a leading international ecosystem in alternative proteins.



Source: Catalonia Trade & Investment

A solid food sector, adapted to consumer trends

- Food industries generate a turnover of €38,205 M in Catalonia, which is equivalent to 16.3% of Catalonia's GDP, and provide direct employment to 164,372 people.
- The major brands are adapting to consumers, who are reducing their meat consumption, and are increasing the sources of alternative proteins in the market.

A powerful meat cluster that adopts alternative

- On a global scale, plant-based protein is already growing very quickly. **Generation Z has increased its consumption of plant-based products by 550% and consumes 60% more plant-based proteins than the millennials.**
- The meat sector is extremely significant in Catalonia: it employs 37,000 people and has a total turnover of €12,000 M. **INNOVACC**, the Catalan meat cluster, recently approved changing its name to "INNOVACC - Catalan meat and alternative protein cluster". The cluster is committed to expanding its scope of **activity with regard to alternative proteins**. Some of its producing members from the sector have already presented new lines that include vegan products, hybrid vegetables or others with combinations of plant-based foods that imitate the taste of meat. Furthermore, they are technologically committed to lab-grown meat.

Unique gastronomy that lays the foundations for food innovation

- Catalonia attracts great interest from gourmet tourism, as one of its assets is a group of Michelin-star restaurants. This gourmet talent is being transferred to food technology and paves the way for alternative and more sustainable routes for meat products.

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.



Source: fDi Markets, Orbis Crossworder, and ACCIÓ

Case studies in Catalonia



Heura[®]

Heūra, 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.

The alternative protein sector in Catalonia

Future trends and opportunities in the alternative protein sector

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

What's next in alternative protein?

Taste remains a challenge for meat alternatives that fermentation can overcome

- Fermentation is a promising solution as it can better reproduce animal-based meat. In 2021, in Amsterdam, the “Bio-Purification of Vegetable Proteins” project was launched, which aims to develop bio-purification techniques based on fermentation, with a view to eliminating unpleasant flavors from proteins of vegetable origin that conventional food processing techniques cannot be obtained without the use of additives.

Fermentation can boost the nutritional value of meat alternatives

- Health and clean label are the main drivers for consumers to choose plant-based meat alternatives, but some products have high levels of salt, fat, and processing. Fermentation is emerging as a viable solution to address these issues, improving nutritional profiles and diversifying protein sources beyond traditional options like soy and peas.

Alternative protein could reduce global warming

- Climate change affects agriculture and food supply by causing extreme weather events that damage crops and livestock. Plant-based protein sources, compared to traditional meat, demonstrate a greater level of sustainability, leading to substantially decreased emissions, more efficient use of land and water resources, can be produced closer to consumers and are more resilient to weather conditions.

Meat alternatives could improve supply chain transparency and food safety

- Consumers and food manufacturers are concerned about food safety and transparency due to food scandals and diseases that affect meat production. This is highlighting the importance of transparency in the supply chain. Fermentation-derived meat alternatives can address these concerns by producing food locally and safely, free from crop or animal diseases.

Relevant challenges: applications to the entire value chain

Technology

- The main companies have a small volume and production capacity in comparison with traditional food companies.
 - ✓ Increase large-scale production capacity.
- **Technological development yet to exploit the fermentation process.**

Cultural change

- Increase in the vegetarian and vegan population, etc.
- Increased awareness of sustainability among the population.
- New responsible consumption habits.
- **Compulsory cultural change due to the increase in population and the unsustainability of the current consumption system.**

Regulations

- Plant-based protein is now generally consumed.
- First steps in **regulating and authorising the production and consumption of fermented meat.**

Price

- **Product with price disadvantages** in comparison with traditional meat, which discourages growth.



Regulations and public initiatives in relation with alternative protein

The consumption of **plant-based foods** and **alternative proteins** is a **rising trend** that must be accompanied by public policies. There are national strategies to develop the production of alternative proteins and support in R&D investment to meet the needs of society and food expectations.

International public initiatives

- **United States:** it is working on a governmental regulatory framework to prepare the launch into general consumption.
- **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 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.
- **Israel:** government support for the Cultivated Meat Consortium.

United States and China

- The USA and China start negotiations regarding the regulating of cultivated meat.
- In December 2022, the Chinese platforms for international collaboration AgFood Future Centre of Excellence (AGF) and Agriculture Food Partnership (AFP) jointly organised an event where experts from two of the largest potential markets for innovation in the meat sector exchanged information on the regulatory approval process and on the market forecasts for cultivated meat (represented by the US FDA and the Chinese National Centre for Food Safety Risk Assessment).
- According to the press release issued by AgFood, its chairman, Ryan Xue, said that “this in-depth sharing between the US and China will have far-reaching significance for governments and industries interested in seeing the adoption of food innovation that will help shape food innovation and the future of food in the US, China, and the world”.

Thank you!

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More information about the sector, news and opportunities:

<https://catalonia.com/key-industries-technologies/food-beverage-in-catalonia/alternative-protein>

