

Food

Sector Report

2023



Ajuntament de
Barcelona



Barcelona
Activa

Abstract

Food

Food is an essential function in the life of living beings. Satisfying this need involves setting in motion a sector of economic activity that produces, processes and distributes a great diversity of foods for consumption. As every person has to eat several times a day — safe, high-quality and varied foods—, a labour market full of professional opportunities is created.

On the other hand, despite the fact that this is economic sector is subject —as any other— to **continuous changes** (due to technological change, the application of new regulations, changes in consumer tastes and habits), it is clear that it will always be there because it responds to a basic need of people. Therefore, there are real possibilities of a career in this sector. In Catalonia, food is often regarded

as another industrial sector and is one of the most dynamic economic sectors in Catalonia in terms of sales, export and employment.

The high **corporate heterogeneity** of the agri-food value chain brings together links of different nature (production, transformation, distribution and consumption of food products) and the sector needs to be analysed as a unitary whole to grasp its complexity.

The **introduction of digital technologies** into food production and distribution creates new business models and also requires the acquisition of new knowledge and skills by the sector's professional profiles —both those related to the production and farming phase and those linked to the processing of products, also including research into novel foods.

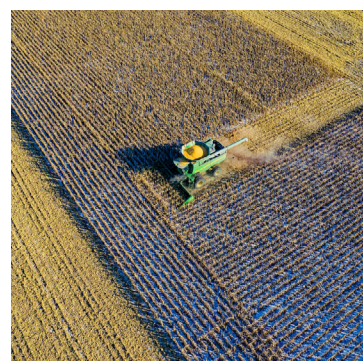
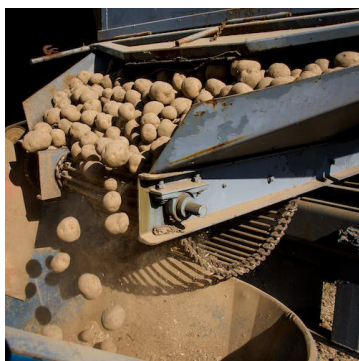
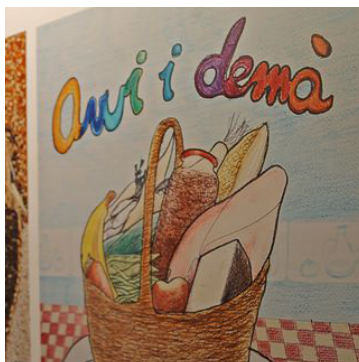




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Get to know

the sector

Introduction to the sector

The Food sector and its activities range **from the primary sector** (production of raw materials) to industrial production and **the tertiary sector** (trade and distribution). In addition, the Food sector has a clear social function. On the one hand, it satisfies the basic need for every human being to feed themselves. On the other hand, in a very particular way, it creates wealth and opportunities that contribute to the economic growth of rural territories, and it does so from the paradigm of their environmental sustainability.

This sector and its value chain must therefore be seen in a broad sense, integrating **the links between the production, processing and distribution of food**. Furthermore, the agri-food chain is complemented by other actors relating to auxiliary services (packing and packaging, equipment and maintenance services, among others), public administrations and entities of the science and technology ecosystem.

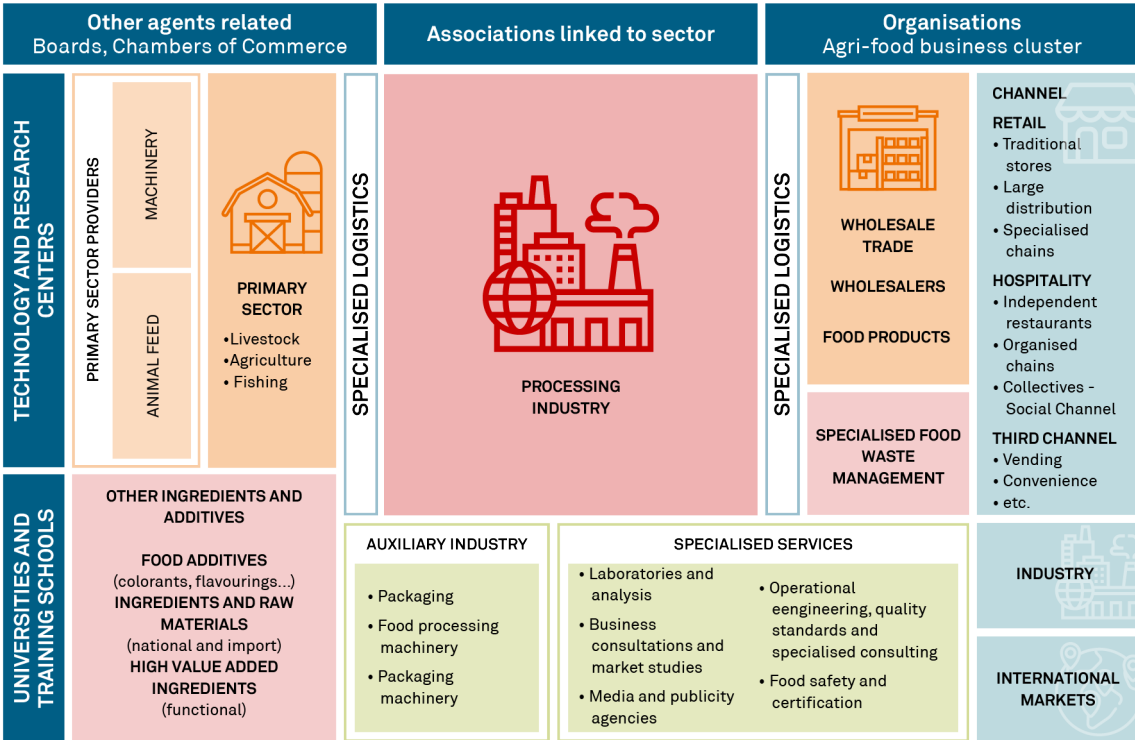
Food becomes a strategic sector in any economy and is made up of professionals from **agriculture, livestock** and **agro-industry**, which includes those companies specialising in the processing of raw materials into processed or semi-processed products. It also includes wholesale distributors, the corresponding logistics operations and retail trade, among others, which have as their main goal the provision of quality food for a given population.



The last link in the food-value chain is the consumption that takes place both at home and outside —in bars, restaurants and other establishments. Recently, the marketing of food products to the consumer public has gained in importance due to the consolidation of e-commerce and the increase in digital purchases, and also due to new trends in responsible and sustainable consumption, as well as the proximity trade paradigm and the consumption of zero kilometre products.

To analyse the structure of the sector, the central element is called **the food value chain (FVC)**, which is the set of stages necessary for obtaining food, from its primary production to consumption. Furthermore, the FVC also incorporates the satellite agents and services involved in the coordinated production activities and value addition needed to manufacture food products.

Figure 1. The food sector value chain



Source: Prepared by the authors, based on data from *El sector agroalimentari a Catalunya*.

Broadly speaking, the stages that make up the food chain can be differentiated into the following four: **production, processing, distribution and consumption**.

Production stage

It refers to economic activities related to the **extraction and collection of natural resources**, such as agriculture and livestock. In this stage, primary food production is carried out through agricultural, livestock, aquaculture activities and the extraction of resources found in the environment —this includes activities such as fishing, hunting and the exploitation of mineral resources for use in food.

Processing and distribution stage

This is the moment when **raw materials are transformed into consumer goods** through transport, processing and storage. At this stage, the distribution of these products resulting from processing —or those coming from the primary sector without any transformation— is also carried out until it reaches the wholesaler or wholesale distributor.

Products may be subjected to different processes such as washing, peeling, cutting, drying, lyophilisation, crushing, extracting juices, fats or other components, cooling, freezing, sterilisation, homogenisation, mixing of different ingredients, culinary treatments and packaging. These are just a few examples of the processes that food may undergo in the processing industries, since there is a great diversity of processes and products and a high level of specialisation and technology.

Retail shop stage

This stage consists of **making food available to consumers** through sale or retail service, including catering services, bars and cafes. This phase is characterised by the large number of companies involved and the fact that it is atomised and geographically disperse. These factors make monitoring and control activities difficult.

This phase has been influenced in recent years by the rise of e-commerce, which refers to all types of transaction through data transmission and telecommunications networks. Depending on the economic agents involved and the relationship between them, we can primarily define the following two types of online trade:

Figure 2. Types of e-commerce



Source: Prepared by the authors, based on data by the Guia eComerc i el producte fresc (Cambra de Comerç de Barcelona).

For businesses, the main advantage currently provided by e-commerce is **access to a global market**. Globalisation and the means of mobility has broken down trade barriers, and e-commerce makes it possible for buyers to contact sellers simultaneously across the globe with only one click. Other benefits of e-commerce are cost reduction (reducing intermediaries), logistics improvement and resource savings.

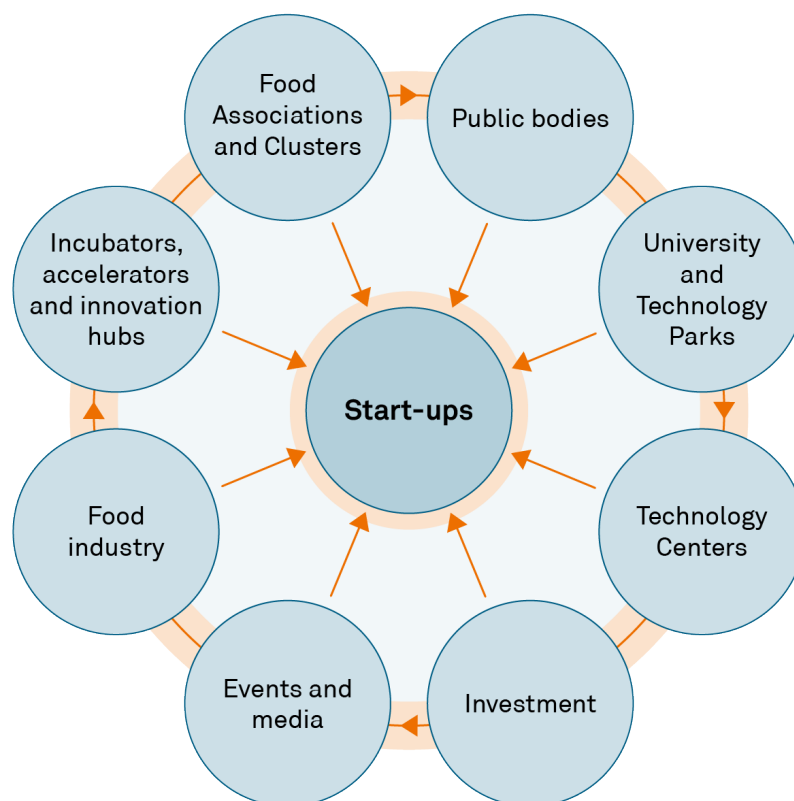
Consumption stage

This stage includes the activities that are the responsibility of consumers, once they have purchased the food until their consumption. It consists of **transportation, storage, manipulation and processing at the domestic (home) or professional level** (bars and restaurants, among others). Lately, trends in this phase incorporate the concept of 'responsible consumption', which aims to eliminate or reduce food waste as much as possible. Thus, many food products, despite being safe and nutritional, are discarded for various reasons and become waste. In the food consumption stage, waste is linked to bad purchasing and consumption habits or inadequate management and manipulation.

- **You should not mistake food waste with food loss.** For example, food is lost on farms because of the climate conditions and harvesting practices, and food loss in shops happens because of the need for products to comply with aesthetic standards in terms of colour, shape and size — as well as the variability of demand.

It goes without saying that the incorporation of new technologies into the sector has led to the emergence of a new field of activity known as **'foodtech'**, which combines technology and food and includes a set of economic and social agents that add value along the agri-food chain and incorporate **innovation as a strategy**. The need for continued innovation and improvement in the efficiency of agriculture and food production — but also of distribution and logistics services — has enabled the development of the new foodtech ecosystem. This ecosystem comprises sectoral associations and clusters, government agencies, universities and technological parks, technological research centres and many more. Start-ups are at the centre of the ecosystem.

Figure 3. The foodtech ecosystem



Source: Foodtech in Spain (2021)



Barcelona, benchmark city of sustainable food

Barcelona is internationally acknowledged for being able to create and disseminate its own food story, as well as positioning itself as a territory of gastronomic change and innovation. In parallel, it is also accompanied by an iconic chain of more than 40 municipal markets and an agro-ecological network committed to economic and social sustainability.

Barcelona is a leading agent in the discussion of the role that food plays in the society of the present and of the future, in terms of both the impact of food on health and ecology. This reflection that drives the city must be a **strategy of public-private** partnership, in which the civil society actively and committedly participates in a framework of **co-design of public policies, entrepreneurship programmes, funding lines and other cooperative-driven initiatives**, such as the [Urban Garden Network](#).

Without going any further, Barcelona was the [2021 World Capital of Sustainable Food](#). This involved more than **90 actions** throughout its metropolitan region aimed at promoting healthy diets, strengthening local economies and reducing the environmental impact associated with the current agri-food model.

Similarly, Barcelona’s attempts to lead the transformation and debate in the food sector were accompanied, in the same year 2021, by the hosting of the **7th Global Forum** of the [Milan Urban Food Policy Pact](#). This was the first international treaty of cities on food that underlines the strategic importance of cities to **design and establish inclusive and diversified agri-food systems**, ensure **healthy and accessible food** for all people and **reduce food waste**, among others.

Both experiences make it clear that Barcelona is seeking a strategic position with regard to the world of food, with the aim of transforming the consumption habits of Barcelonans hand in hand with a transition to a safer, sustainable and healthier model of food exploitation and consumption.

Figure 4. The 4 dimensions of sustainable and responsible food.



Source: Prepared by the authors, based on data by the Barcelona City Council, Area of Economy, Labour, Competitiveness and Taxes (2021).

Fields of activity

The food sector is based on the **production, processing, preparation and packaging of food products for human consumption**. It interacts with the primary sector, from where it extracts raw materials (farming, livestock); with the secondary sector, where it transforms these materials; and with the tertiary sector, where it sells the goods produced. In addition to producing food and drinks, food production incorporates a strong component of innovation and research, which makes it possible to promote technological development, to introduce improvements in the quality of products and to control and reduce the environmental impact.

In addition to the vision provided by the value chain, which was mentioned at the beginning, the food sector may also be explained in terms of subsectors of economic activity which, basically, are specific to food production. This productive activity is traditionally known as the primary economic sector and consists mainly of agriculture and livestock farming. In addition, the food industry is concerned with the processing of raw materials into food. Thus, the subsectors comprising the food industry are:

Agriculture and Livestock

It refers to the **production of raw materials** that will subsequently become suitable for human consumption. For example, fruit produce (apples, pears, oranges) is harvested from the tree and must obtain health records, be packed and transported to the point of sale. Therefore, the cultivation of agricultural products and the exploitation of animals (eggs, meat and milk, among other products for human consumption) constitute the bulk of agriculture and livestock farming.



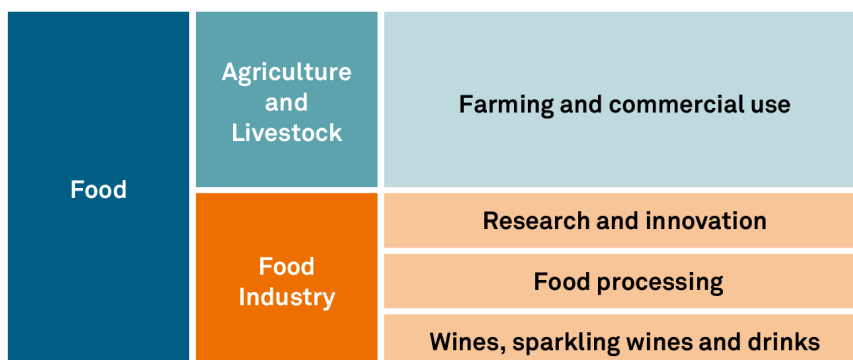


Food Industry

It refers to the processing and processing of products that form the basis of human food. In the food industry there are the following economic areas:

- **Research and innovation:** it is the R&D that companies in the sector must incorporate to offer more balanced, nutritious, healthy and safe products for consumption.
- **Food processing:** It includes a wide range of product-processing activities (bread, cold meats, dairy products, meat products, etc.) that transform raw materials into consumer-friendly products.
- **Wines, sparkling wines and drinks:** it includes foods that have a non-solid component and that have created their own production, processing and marketing channels. Essentially, this area consists of beverages such as wine and cava, which have the characteristic of containing alcohol, and the production of so-called soft drinks.

Figure 5. Structure of the food sector



Source: Prepared by the authors

Sector Trends

The demand for food is changing to **new purchasing habits** and to **consuming healthier and more environmentally friendly food that takes animal welfare** into account. This has an impact on food production. In parallel, the **technological modernisation and innovation of the processes**, materials and systems involved in the food chain mean an improvement in the production and quality of the various food products with the aim of offering the consumer public increasingly competitive and sophisticated food, in accordance with the demands of the moment.

Established trends

- **The idea of sustainable food is increasingly consolidated amongst the various economic and social agents of the sector.** It consists of feeding the population in a way that benefits people, the planet and territories. Thus, food is produced, transformed, sold, bought and consumed by creating prosperity, promoting social justice, caring for, conserving and regenerating existing resources and ecosystems, safeguarding the ability of future generations to also feed themselves in a sustainable manner.
- **The current consumer shows growing interest in the development of food with bioactive potential (functional foods),** aimed at combating several of the pathologies that spread today in developed societies. Thus, if food is to be healthy and personalised, it must adapt to the individual needs of the consumer, which involves deepening the study of the human genome and microbiome and its influence on our physical and mental health.
- **Technological innovation in the production and design of new biodegradable packaging to avoid disposable plastics.** The most interesting alternatives for operators in the sector are those materials that come from a renewable source and are biodegradable and may be object to circularisation (circular economy), such as **bioplastics**. Its purpose is to extend the life cycle of the material as far as possible, to make it more sustainable to obtain and to prevent the generation of waste.



- In terms of farming and agricultural production, we must highlight the consolidation of **information technologies related to the monitoring of data** produced and recorded throughout the production process. The various widgets used incorporate real-time sensors and are linked to software that process and summarise data to make it easier for producers to interpret. In parallel, tools such as drones —which obtain aerial images and allow more intensive farming to be controlled— also help to detect prematurely problems in irrigation, fertilisation, as well as pest and disease.

Emerging trends

- **The production of vegetable proteins in the form of new products** is a novelty that brings consumers closer to reducing their consumption of products of animal origin, especially meat and milk. Beyond the production and consumption of highly protein-rich plant products, the sector responds to the emerging demands of consumers who want to reduce or remove the presence of animals in the food chain. In this sense, new products such as plant-based meat are developed. This is a segment of the expanding food market and involves large food companies and new start-ups.
- **3D printing** is, in food matters, one of the preferred ways of this individualisation applicable to diets, intolerances and any other personalised profile. The diversity and quantity of nutrients, vitamins and calories may be accurately controlled in the scientific chart. Furthermore, 3D manufacturing can, according to experts, respond to food development for global markets. This allows for better optimisation of resources, given their facility to reproduce food processing information.
- **Precision feeding**, based on each person's lifestyle, can provide a more solid basis for dynamically adjusting the diet, adapting it to the different demands and physiological requirements over time. Precision nutrition focuses on individual modifiable factors: psychological and behavioural aspects, cultural aspects, social and economic situation, etc. All of them can influence the chosen diet. To a large extent, this trend is aimed at adults and older people, with the aim of reducing the risk of chronic diseases and thus promoting healthy ageing.
- **Organic farming seeks to protect the environment and protect people's health**, not using, for example, artificial fertilisers. It is also characterised by the re-use of nitrogen and waste and the use of biofuels with the aim of establishing a model for the exploitation of healthy land that enables quality food to be obtained and enjoyed through interaction with the agricultural environment.



Professional profiles

Global food market revenues are expected to increase by a total of USD 3.6 trillion (+38.46%) between 2023 and 2028, according to the [latest figures published on Statista](#). After the tenth consecutive year of growth, the indicator is estimated to reach **USD 12.96 trillion** and thus, a new peak in 2028. In particular, food market revenues have been growing steadily in recent years.

In the European Union, food production is the main activity of the manufacturing industry, according to the [annual report of the Spanish Food Industries](#) by the Spanish Ministry of Agriculture, Fishing and Food for the period 2022 - 2023. With a value of more than **EUR 1.121 billion** in business and accounting for 14.3% of the manufacturing industry, the sector has 294,000 companies employing 4.62 million people. In addition, the Spanish food industry ranks fourth in business number (11.4%), behind France (18.9%), Germany (16.5%) and Italy (12.8%).

In **Spain**, following the data from the previous report, the food sector **represents 2.4% of GDP** and combines more than 30,159 companies, which accounts for 15.7% of the manufacturing industry. 96.3% of these are companies have 50 employees or less (29,057) and 78.9% have up to 10 employees (23,792). The number of employees in the sector is 539,400, with a female rate of 39.1%.

However, technology and changes in consumer habits are revolutionising the food sector, which has encouraged the creation of companies specialised in organic products and to **demand more specialised professionals** and more qualified R&D departments. In particular, people with training in food science and technology and human and dietary nutrition are required.



Thus, a set of **professional profiles** that will be key to the sector's development in the near future is highlighted below:

Agricultural holdings and organic production manager

They are the person who **manage the planning, production and collection of foods** in accordance with the rules governing organic production and often also the marketing of foods (vegetables and animals) or their derivatives, produced on the farm. They also deal with the maintenance of agricultural machinery in its optimal state of use. Due to the digitisation of food production in recent years, they must have knowledge of the application of information technologies and, in particular, of sensors and robotisation.



Nutritionist

They are the professional providing **technical support on the nutritional aspects of food** that the company markets. **They advise the department of research, development and innovation** on products; the marketing department on how to communicate the nutritional effects; and the business department on how to transmit them to customers and to answer consumer public questions. In this profile, additional training is highly valued, especially that which makes it possible to understand the particular characteristics of the sector.

Agrotechnology application expert

They are the person who **use electronics, computing and telecommunications to develop applications** in the fields of agriculture, livestock, fisheries and aquaculture that allow the optimisation of existing resources, which are natural (for example, solar energy) or economic (for example, crop yield software, greenhouse control, etc.). To carry out their task, they need to be familiar with tools such as GIS (Geographic Information Systems), GPS (Global Positioning Systems), and electronic image processing tools.

Expert in food safety and quality

They are responsible for **coordinating the aspects that may affect the safety of food products** produced by the company, performing prevention, analysis, control and management functions to ensure that none of the food produced is the cause of a health problem to the consumer public. They must be up to date with the latest trends in specific techniques and devices that detect and control the typology of one or more microorganisms present in a food, whether a raw material, a semi-produced product or a final product.

Expert researcher in new foods

They lead **research projects applied to the design and development of functional or nutraceutical novel foods**, which are those that are enriched or enhanced with the aim of having a beneficial effect on some function of our organism, and providing a better state of health and well-being. They need to know the innovations that are going on in the market and analyse and validate their application to the food produced by the company.



Expert in Food Packaging Applications

They are the **leader of research into applications of new materials and packaging techniques** within a strategy of launching new products, improving current packaging and/or adapting to new packaging and food conditioning technologies. They are aware of the latest market and consumer public trends (e.g. sustainable and eco-friendly packaging) and are able to analyse a great deal of data through new technologies and design a product with a good visibility.

Beekeeper

This professional **breeds and cares for bees** with the aim of obtaining the products derived from their activity. While honey is the main and most popular resulting product in beekeeping, other products such as propolis or royal jelly may also be obtained, as well as from more elaborate products such as natural cosmetics or candies. In recent years, an urban movement of honey production is being consolidated in large urban areas, with the will to naturalise cities and raise public awareness of the importance of their ecological role.

Farmhand

They are the person **responsible for carrying out the most basic and necessary activities to ensure the proper functioning of the farm** and to ensure its viability. They assist in the implementation of land preparation operations, and they also assist in seeding, pruning, harvesting, irrigation, fertilisation and application of plant protection treatments in agricultural crops. By incorporating agricultural technological solutions to manage crops (e.g. automation of irrigation systems or sensor use), they must be up-to-date and known to ensure good maintenance.

Furthermore, in line with the consolidation of information and communication technologies at the various stages of the value chain of the food sector, the growing importance of R+D activity and changes in consumer public habits towards models where sustainability and the closeness of the product predominate, **other professional profiles** may also be highlighted, such as the [Livestock technician](#), [Meat process worker](#), [Professional taster](#) or [Oenologist](#).

The sector in figures

The food sector is the **leading industrial sector in Catalonia**, although it encompasses very different realities in terms of workers, wages and production processes, as well as technological applications or internationalisation of companies. According to the latest 2022 data, the sector **generates a turnover of EUR 43.09 billion** —which is equivalent to 19.2% of Catalonia's GDP— and directly employs 177,031 people.

The primary sector, with 57,427 farms and 55,022 workers, generates around EUR 4.69 billion per year (11% of the total sector), while **the processing industry generates around EUR 30.09 billion per year**.

Regarding the sector's configuration, this industry consists of 4,253 primary sector and food processing industries and 57,427 farms. In addition, it has 658 establishments of agri-food auxiliary industry (seeds, ingredients and food additives, packaging or auxiliary machinery, etc.), with 31,430 jobs.

In terms of turnover, **the meat market is the first transforming subsector**, with **31% of the business, 686 companies** and **32,542 people employed**. Then there is the fine food, which achieves a different market position for the added value it brings in higher quality, an exclusive sales channel, a sophisticated and distinctive packaging or a single account. It accounts for 30% of the turnover. The rest, at a distance, are vegetable oils (8%), wine and cava (7%), fruit and vegetables (3%), grain and milling (2%) and fish and shellfish (1%).

Figure 6. The food sector in figures (2022)

Food	Catalonia
Weight of Food (% GDP)	19.2%
Jobs	177,031
Companies (farms + processing industry+ auxiliary industry)	62,338 (57,427 + 4,253 + 658)
Total turnover	43.09 B€
Main transformer subsector and business volume	Meat industry, 10.08 B€

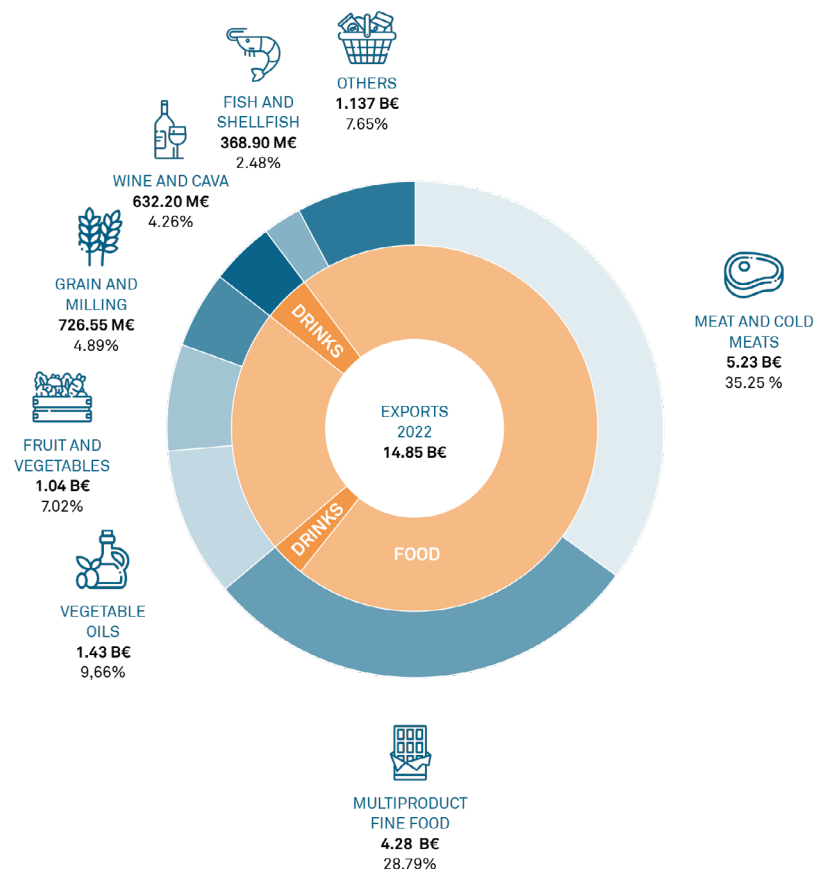
Source: Prepared by the authors, based on data retrieved from the report Sector Agroalimentari a Catalunya (2022)

In recent years, the food sector as a whole has experienced a **good rate of growth** in its exports. Catalan foods have achieved significant value in international markets. In 2022, Catalan agri-food exports increased by 12.3%, which amount to over EUR 12.88 B and account for 16% of total Catalan exports from all sectors.

With EUR 14.85 B exported and EUR 14.16 B imported during the period 2011 to 2022, **the Catalan agri-food sector is the twelfth exporter of the European Union** and its exports account for 22.18% of Spain's total exports in value and 24.16% in terms of the number of companies that export regularly.

Catalonia exports food to more than 200 countries and the meat sector is the most important exporter (35% of the total), followed by the fine food, fruit and vegetables, oil, wines and fish and shellfish. Within the meat sector, pig meat stands out, accounting for 62% of the total meat sector.

Figure 7. Exports of the Food sector in Catalonia, by subsector (2022)



Source: Prepared by the authors, based on data retrieved from the report *El Sector De La Catalunya Agroalimentària* (2022).

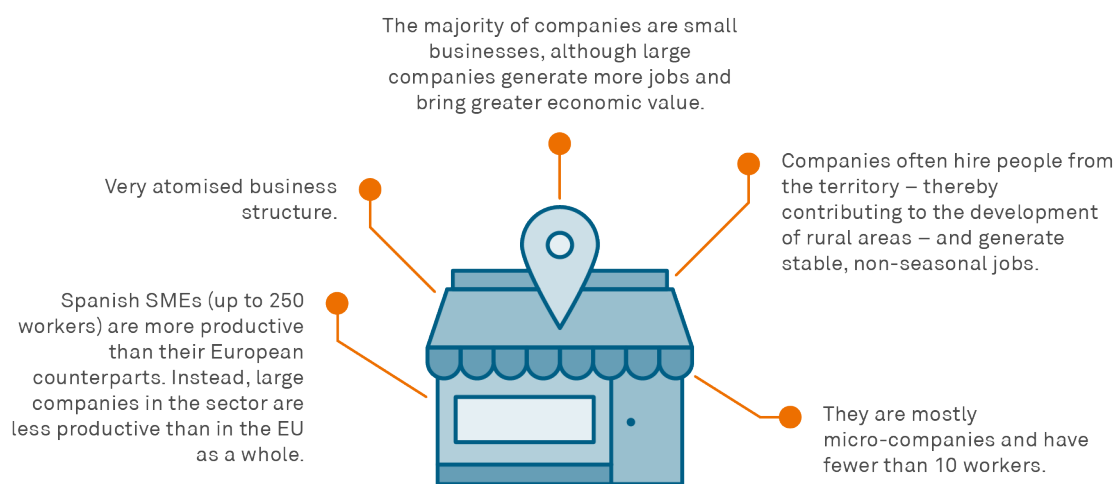
Within food, one of the subsectors that show the most exporting strength is wine and cava. According to Prodeca and the Catalan Department of Climate Action, Food and Rural Agenda, despite the bump of the 2020 pandemic, **Catalan wine exports in 2021 saw an increase of 18.97% in value and 11.42% in export volume**. The wines and cavas of Catalonia are exported to 145 markets around the world, with the United States, Germany and the United Kingdom being the main destination markets.

In relation to the sector's activity in the Metropolitan Area of Barcelona (AMB), it is an eminently consumer region, in which in recent decades **the agricultural area has been reduced from the 39% existing in the 1950s** to the current 6% due to strong urbanisation, and a portion of the agroforestry spaces that have survived urbanisation have been abandoned. It is notable for the presence of the **Baix Llobregat Agrarian Park**, an agricultural estate of private economic activity with its own project. It concentrates most of the farmland of the AMB and is located in an area with suitable weather and water supply conditions.

As for the **processing industry**, it generates over **EUR 1.95 billion** of Gross Value Added (GVA) and 30,392 jobs in AMB (2018) where large companies (just over 10%) coexist with SMEs's (nearly 90%). The AMB concentrates a large part of the headquarters of major national and international industrial companies, as well as a good representation of companies of equipment specialised in food technology. **New technologies** have been developed in recent years —especially in processing machinery and packaging machinery—, driven by changes in consumer habits and by increasingly strict hygiene and health measures.

Thus, it should be emphasised that the **average size of companies and the atomisation of the food sector** is one of the main difficulties preventing the process of internationalisation of these companies from becoming more effective. It is a highly atomised business structure, dominated by small companies and larger companies which are less productive than European counterparts (which is also the case of the rest of Spain). In 2021, 96.1% of companies had fewer than 50 employees (29,389) and 79% had fewer than 10 employees (24,160).

Figure 8. Characterisation of the companies in the Food sector



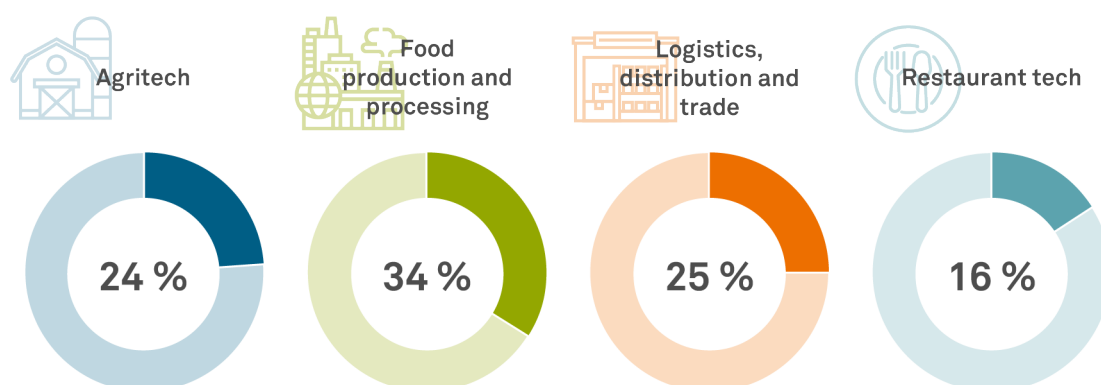
Source: Prepared by the authors, based on data retrieved from the report *La industria agroalimentaria española: estructura empresarial y productividad* (2019).

Along the same lines, it is also worth noting the growing economic weight of the foodtech market, which is formed by food companies dedicated to using technology to improve the efficiency and sustainability of the sector. In Spain, in 2022 there were 412 foodtech start-ups and 40% of these are concentrated in the area of food production and processing. In this regard, Catalonia has become the first creator of foodtech start-ups (22.45%), followed by the Community of Madrid (20.21%) and Andalusia (14.29%).

In Catalonia, 106 start-ups already belong to the foodtech sector and, among these, there are companies dedicated to improving the efficiency of agricultural techniques. These are companies linked to the delivery service, and start-ups specialised in food safety and traceability, the generation of new products such as plant protein or the reduction of waste in the food sector.

Finally, with regard to the population's **eating habits**, there is a tendency to question the issue of **food waste in households, retail and catering**. Due to this social demand to reduce waste, the [Plan for the Prevention of Food Waste in Catalonia](#) 2019–2020 was launched, in view of the fact that **each Catalan person wastes 35 kilos of food per year**, equivalent to 7% of the foods purchased.

Figure 9. Percentage of startups foodtech by agri-food stage. Spain 2022



Source: Prepared by the authors, based on data retrieved from the report Foodtech in Spain (2022)

The Plan for the Prevention of Food Waste in Catalonia includes six challenges that have shown varying degrees of compliance: **knowledge** (45%), **awareness** (78%), **prevention at source** (59%), **exploitation** (55%), **governance** (56%) and **regulation** (55%). Raising awareness and educating about this serious problem is the first step towards avoiding waste. The aim is to recover the value of food and to think that food remains are a resource, not a waste.

Weaknesses

- The **business structure** of the food sector is **broadly atomised** and has little coordination between its agents, making it difficult to defend its interests, adopt new technologies and innovations, and make companies less competitive.
- The sector **has little power to attract workers** — especially young and educated workers —, partly because of the low appeal (due to ignorance) of the professions that make up it.
- High levels of food loss and waste in all links in the **food value** chain exist as an improvement element. Recently, efforts are being made to reduce it and make food production and consumption more circular.

Threats

- The effects and negative impact of **greenhouse gas emissions** and **waste generation** increasingly highlight the climate emergency we are experiencing and, consequently, the need to move towards a cleaner and more energy-sustainable food model of production and consumption.
- There is a **lack of social prestige** of trades and professional profiles linked to primary production, in the field and cultivation stages (the first stage of the value chain), which makes generational renewal difficult.
- The citizenship **lacks proper eating habits** due to their lifestyle (long work days, tendency to eat out, increase in pre-cooked meals), which can result in a loss of culinary culture and its values.

Strengths

- **High potential** of the food sector **to transform and generate a positive environmental impact**, with particular attention to the use of technologies and the Industry 4.0 to achieve good sustainability results.
- The food sector **is key to the lives of people and communities** and is always classified as strategic, both because of its potential for environmental transformation and because of the possibility of creating jobs outside cities and metropolitan areas.

- The sector is adopting **high levels of technification and productive specialisation**, making it possible to make the population stay in the territory and contribute to the development of rural areas and social cohesion. In addition, especially at the food processing and distribution stage, it creates relatively stable employment throughout the economic cycle.

Opportunities

- The raising awareness by a part of the world's population regarding the **need to transform production, processing and consumption models** into a more sustainable, healthy diet, allowing new types of production to emerge and the revaluation of certain products.
- **Innovation and adoption of new technologies** are listed as the keys to the future of food, and evidence of this is the growth of the foodtech market and the recognition of an entire start-up ecosystem formed by a large number of agents responding to market demands.
- Interest of external markets in Catalan products that can **strengthen the export capacity of companies**, in a sector highly strategic by their export capacity.

In short, the food sector is in the midst of a **period of change and transformation** resulting from the application of new technologies along the agri-food chain, the need to move towards a more sustainable and energy-efficient model and the change in habits of the consumer public, who are increasingly concerned about the origin of products and giving preference to local and proximity foods.

The application of technologies such as mass data, artificial intelligence, additive manufacturing, or the Internet of Things (IoT) along the agri-food chain (sensorisation of fields of cultivation, crop prediction, precision feeding, 3D and 4D printing of foods) mark **new trends in food** and modernise the sector in order to meet the demands of consumers. In parallel, the concept of **sustainable food** and **responsible consumption** gains ground and imposes a change in the logic of primary processes (ecological production, use of biofuels, circulation of waste), secondary processes (nutritional food improvement, biodegradable packaging, automation of processes to make them more sustainable) and consumption (reducing food waste, reuse of packaging, proximity trade).

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WILKOSZENATOR. Cover image. Pg.3.

IGNASI ROBLEDÀ. A kid's drawing about healthy food. Pg.8.

CURRO PALACIOS. A farmer cuts an artichoke from the plant. Abstract.

EDU BAYER. World Central Kitch's volunteers preparing packages with food. Abstract.

MARK STEBNICKI. Potatoes. Pg.2

ANNA SHVETS. Woman making cheese. Pg.2

TOM FISK. Collected. Pg.2

FLAMBO. Pg.4

ANTONIO LAJUSTICIA BUENO. Pg. 8.

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ZOE SCHAEFFER. Quality control of seeds. Pg.15

ELAINE CASAP. Hands holding tomatoes. Pg. 15

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