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Foodtech in Spain

Moving Spanish
Food System Forward



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Dear reader,

I am proud to present the report **Foodtech in Spain: Moving Spanish Food System Forward**. This is a second edition of a report that seeks to focus and put in context the international potential of Spanish Foodtech, especially the different initiatives that have been developed throughout the year 2021.

This second report highlights the consolidation of the foodtech sector within the food chain in Spain. This fact is consistent with the power of our Food Industry, which in 2021 has once again broken export records with more than 55,000 M€. The dynamizing and transforming capacity of innovation is essential for our agrifood enterprises to be increasingly competitive within and beyond our borders.

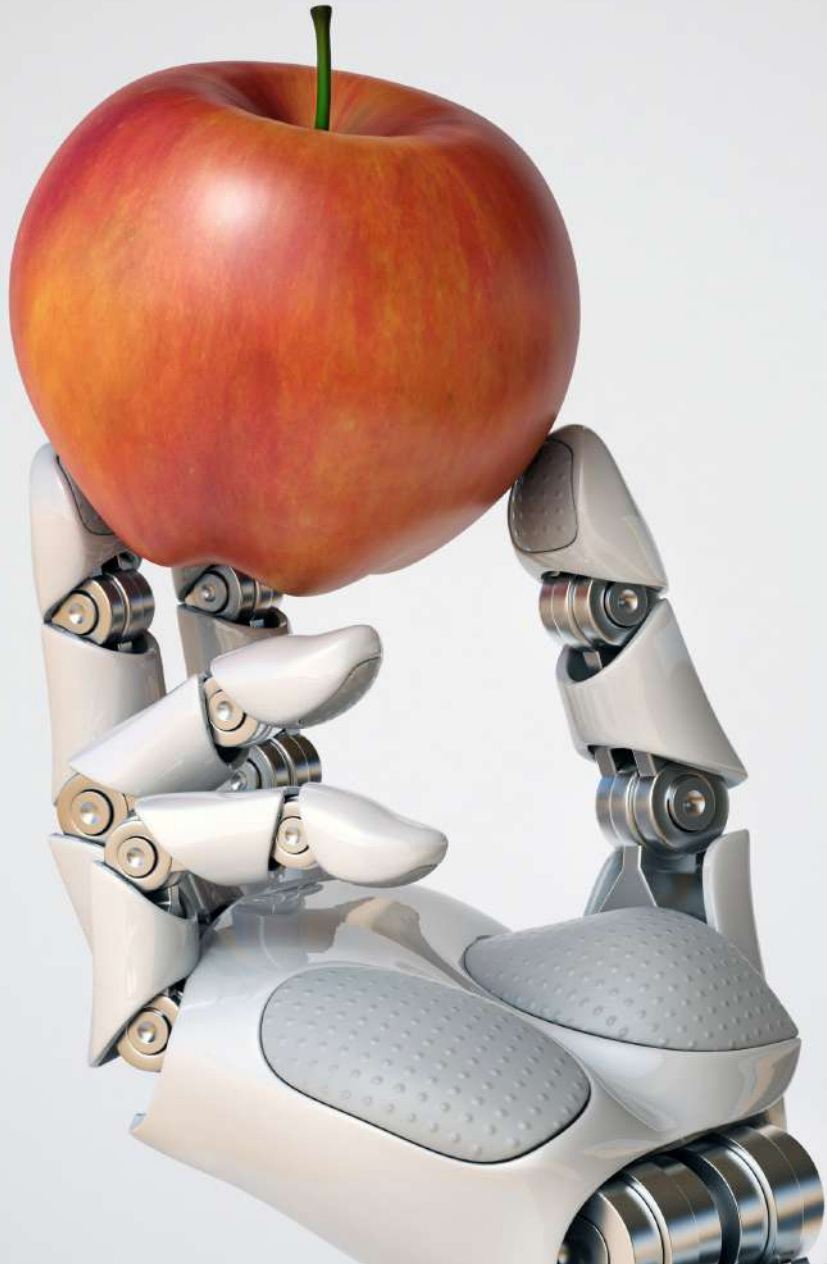
As this report reveals, 2021 has been a crucial year for the foodtech sector in Spain. The strong increase in investment, both domestic and foreign; the proliferation of investment funds vertically specialized in this ecosystem and the firm commitment of the Spanish Administration to promote innovation in the food system through the Next Generation Funds endorse this process.

ICEX has renewed its support to the foodtech sector through new initiatives such as [Desafia footech NL](#). This program is aimed at facilitating the immersion of Spanish startups in the Dutch ecosystem. We also continue to work on attracting quality investors in international forums as [“Foodtech Matters”](#) (UK), national events such as [“Food 4 Future”](#) in Bilbao and our own talent attraction program [“Rising up Spain”](#). We have also designed a visibility platform for this sector through our portal architecture and turn innovation into the flagship of our food industry.

One of the most developed categories in the year 2021, since it has a great interest among international investors, have been alternative proteins. Within this sector, a great evolution has been observed in the last year, which has helped to position Spain on the map of alternative proteins worldwide. Therefore, in this new edition of the report we have gone into detail in a special section that describes the evolution of the alternative protein sector and the positioning of Spain in the development of innovative products and technologies.

We hope you enjoy the read and consider #Spainfoodtechnation at the top of your Foodtech ecosystems list.

1 You may consult the first edition [here](#).



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1 Introduction





1 Introduction

Foodtech in Spain: Scaling the future of food from Spain

Spain is positioned as the fourth largest agri-food power in Europe and tenth in the world. Thanks to the quality of its products and their wide variety, the Spanish agri-food sector enjoys great prestige in international markets.

The Spanish agri-food sector is strategic for the nation, as it contributes 10% of the national GDP and generates more than 2.8 million jobs, directly and indirectly.

2021 marks a tipping point for the Spanish foodtech ecosystem, as investment in startups has tripled (695M€), placing Spain among the global leaders in the matter. This figure places foodtech as the second most important startup investment category, behind only transportation.

It also has a strong export vocation, with a value of €58.21 billion in the current year to September 2021.

This is the second edition of a report whose main objective is to give visibility to the Spanish Foodtech ecosystem and show its potential to become a Foodtech Nation. Check the previous report [here](#).

In 2021 the Spanish Foodtech panorama reached an outstanding position due to a series of developments such as:

- stronger collaboration among ecosystem agents
- entry of new international investors
- exponential development in alternative proteins

All of this, alongside the relevant milestones attained by Spanish startups are leading the way for Spain to become a Foodtech Nation.

More than **30,000**
companies in
food transformation

More than **50**
specialised
universities

More than **20**
cutting edge
technological
centres

407
Foodtech
startups

¹ Planas Inauguración Datagri 2021: <https://www.mapa.gob.es/es/prensa/ultimas-noticias/luis-planas-la-transformaci%C3%B3n-digital-no-es--una-opci%C3%B3n-es-una-necesidad--para-el-sector-agroalimentario/tcm:30-581254>



1 Introduction

Foodtech: A very broad sector, destined to be the next big thing in the food industry

The term Foodtech refers to all economic actors associated with innovation in the food industry, from food production to food consumption.

To help with our analysis, we have developed our own taxonomy and organized it into four sections: agritech; food production & transformation; logistics & distribution; and restaurant tech.

Each of these segments encompasses various sources of innovation and technologies, such as biotechnology, robotics, blockchain, artificial intelligence, machine learning and big data.

Thanks to these technologies, the Foodtech ecosystem will be closer to facing the sustainability challenge presented by the agri-food industry.

Foodtech:

Agritech

- a. **Ag-Biotech:** soil regeneration, seed optimization, etc. through the use of biotechnology.
- b. **Crop automation systems:** Software and hardware for agriculture.
- c. **Robotics applied to agriculture.**
- d. **Water management.** and new growing systems: Vertical Farming, Indoor Farming, hydroponic and aquaponic crops, etc.
- e. **Intensive cultivation systems** (greenhouses and productive improvements).
- f. **Marketplaces for agriculture.**
- g. **Others.**

Foodtech: Food production and transformation

- a. **New sources of ingredients:** plant-based, fermentation, biosynthesis and insects.
- b. **New products** made with new ingredients. Includes all kinds of innovations
- c. **Technology applied to the improvement** of food production processes.
- d. **Packaging and Traceability** (including blockchain and IOT)
- e. **Food safety**
- f. **Food waste management** and circular economy.
- g. **Others**

Foodtech: Logistics, distribution and retail

- a. **Robotics applied to retail.**
- b. **Retail analytics platforms.**
- c. **New sales channels:** Direct to Consumer models (online sales, meal kits, digital native brands, new generation vending, etc).
- d. **Smart tags.** Such as traceability, knowledge.
- e. **Delivery and last mile of packaged products.**
- f. **Food waste management** of packaged and retail products
- g. **Others**

Restaurant Tech

- a. **Reservation platforms**
- b. **Hospitality management platforms**
- c. **Cloud Kitchens.**
- d. **Cooking Robots:** kitchen applied robotics
- e. **Payment services development**
- f. **Restaurant marketplaces**
- g. **Delivery and last mile Horeca**
- h. **Food waste management Horeca**
- i. **Others**



2 Spain's Foodtech Ecosystem

2 Spain's Foodtech Ecosystem

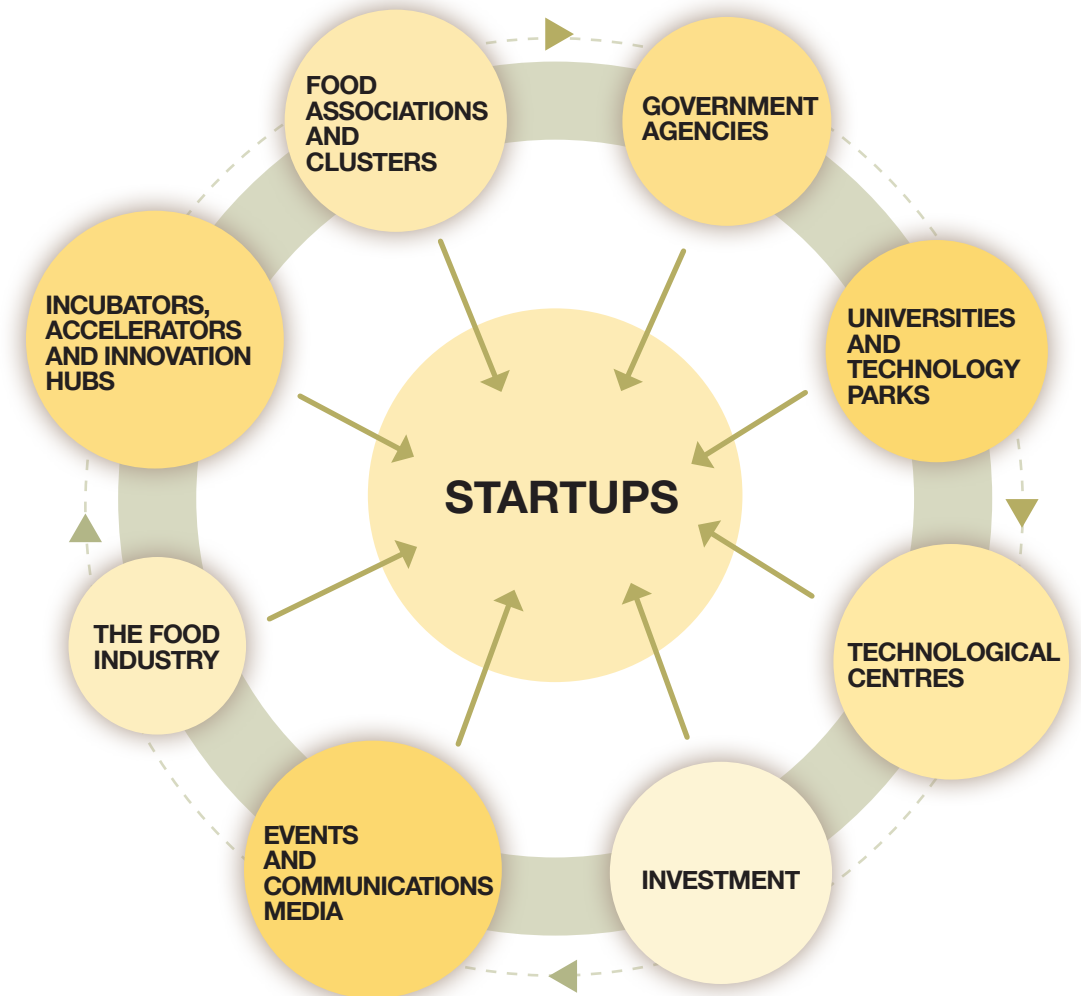
Introduction

Spain's ecosystem has grown in the last year with the objective of becoming one of the leading Foodtech nations worldwide.

The Spanish ecosystem is the 5th highest for investment in European Foodtech ecosystems after Germany, the UK, France or Netherlands.

This ecosystem includes national, regional and local government agencies, business associations, technology centres, science parks, universities, incubators and accelerators, and of course, startups, which are playing an active role in building Spanish foodtech.

The following report analyzes the main agents in this ecosystem, and how they interact with each other.



2 Spain's Foodtech Ecosystem



Government Agencies: fundamental support underpinning the ecosystem

At the national level, the Ministry of Agriculture, Fisheries and Food will be managing **1.051M€ from the PRTR**¹, aimed at developing an environmental and digital transformation of the agri-food and fisheries system. It has also launched the second action plan in the **Spanish Strategy for the Digitalization of the agri-food sector**. The budget is **62M€** and includes 20 action measures aimed at enhancing the technological development of the entire value chain during the period 2021-2023.²

The **Agroimpulso** initiative, launched by the Ministry in collaboration with the **Empresa Nacional de Innovación (ENISA)**, aims to grant loans on favorable terms to agri-food SMEs that undertake technology-based projects. **CDTI** is another fundamental agency supporting the new ventures in Spain with its NEOTEC program that has a total budget of **36,5M€**, 11,5M€ more than in 2020.

ICEX Spain Export and Investments, has launched the first **Desafía** program focused on Foodtech. This is an international immersion program in the Netherlands backed by Next Generation EU funds, with the objective of support in internalization and fast growth of the Spanish Foodtech ecosystem.

Collaboration between government agencies and other actors has increased in the last year. One example is the project **PROTEINLEG promoted by FEUGA**, that is working on the development of sustainable plant-based sources together with different actors including national technological centres, startups, corporations and universities. From the Madrid City Council, the **Madrid Food Innovation Hub** initiative stands out due to its aim at promoting Foodtech entrepreneurship in the region with an international scope. The same region also has the **Madrid Innovation Driven Ecosystem (MIDE)** initiative, promoted by the regional government. This plays a fundamental role in connecting agents and collaborating with Latin American countries to attract international investment.

¹ Plan de Recuperación, Transformación y Resiliencia: <https://planderecuperacion.gob.es/>

² DIGITISATION STRATEGY FOR THE AGRI-FOOD AND FORESTRY SECTOR AND RURAL AREAS: https://www.mapa.gob.es/es/ministerio/planes-estrategias/estrategia-digitalizacion-sector-agroalimentario/digitisationstrategy_tcm30-513192.pdf

2 Spain's Foodtech Ecosystem

The Agri-food Industry: united to create value

The food and beverage industry in Spain represents the main activity of the manufacturing industry. According to the latest data published by the [INE](#), the sector's turnover amounts to €130,795.8 million, representing 23.3% of the industrial sector, 22.1% of the people employed and 19.2% of the added value. Furthermore, this industry encompasses 30,573 companies, i.e. 15.6% of the Spanish business fabric.¹ [AECOC](#) and [FIAB](#) are two organizations that bring together a large part of this business fabric, providing a wide range of services.

Clusters also play a fundamental role in the ecosystem, facilitating collaboration and mobilization of different agents to access European Union aid, as is the case with the Next Generation funds.

[CLUSAGA](#) is one of these clusters, using the funds in collaboration with regional institutions to support 44 foodtech projects in 2022, via their accelerator [Business Food Factory](#).

Another important project is the **Ebro Foodtech Valley**, that is involving 61 companies and 158 production centres in the country with the support of the governments of Navarra, La Rioja and Aragon. Its objective is to rise €1,000 million, by developing several initiatives to attract funding from European Next Generation funds.

Associations & Clusters

AGENCY	LOCATION
Acuiplus Cluster	National
AECOC	National
Asebio	National
Aragonese Food Cluster	Aragón
Bioga	Galicia
Biovegen	National
CLUSAGA	Galicia
FIAB	National
FOOD+i Cluster	Navarra
Foodservice Cluster	Catalonia
VITARTIS	Castile and León

Source: prepared by the author

¹ Informe Anual de la Industria Alimentaria Española Periodo 2020-2021: https://www.mapa.gob.es/es/alimentacion/temas/industria-agroalimentaria/20210707informeanualindustria2020-2021ok_tcm30-380020.pdf

2 Spain's Foodtech Ecosystem

Technological Centres: keys to combining technological excellence and flavour

Technology centres in Spain are at the forefront of the development of technologies that bring efficiency to the system, as well as in the discovery of novel ingredients and product development.

These agents play a fundamental role in the development of innovation for different companies, since they normally work together to carry out day-to-day projects in the companies. However, they are also working on collaborative projects together with companies and other agents in the ecosystem to develop solutions that facilitate the construction of a more sustainable food system.

This is the case with [CNTA](#), which has recently carried out Ebro Food Valley, previously mentioned. This centre has also been a key partner in programs with leading startups, such as Spain Foodtech and Mylkcubator.

Another example of a centre that is carrying out collaborative activities is the [IRTA](#) technology centre, leading the Profuture project to demonstrate the potential of micro-algae in the development of products for both human and animal use, demonstrating both their social and economic benefits.

Main technology centres with lines of work linked to Foodtech.

AGENCY

[AINIA](#)
[ANFACO-CECOPESCA](#)
[AZTI](#)
[CARTIF](#)
[CNTA](#)
[CSIC](#)
[CTAEX](#)
[CTNC](#)
[CTIC CITA](#)
[EURECAT](#)
[I+DEA](#)
[IRTA](#)
[LEITAT](#)

LOCATION

Valencian Autonomous Community
Galicia
Basque Country
Castile and León
Navarra
National
Extremadura
Murcia
La Rioja
Catalonia
Castile and León
Catalonia
Catalonia

Source: prepared by the author

2 Spain's Foodtech Ecosystem

University and Technology Parks: Promoting applied research and creating startups and spin-offs

The role of universities and technology parks in the development of startups with a strong technological component is fundamental. The research conducted by these universities is generally carried out in science parks with the technology to scale these solutions. The institution in charge of grouping all these parks at a national level is the [Association of Technology Parks \(APTE\)](#).

According to an Asebio report, our country has a consolidated science and innovation system with multiple areas of excellence and a prominent international profile, as shown by our participation in Horizon 2020. Spain is the ninth highest world power in the production of scientific knowledge in areas such as biotechnology and life sciences. Its biotechnology is also considered to be excellent and of high impact, with 23% of articles being in the top 10%.

Some examples of this are Nucaps at the University of Navarra; Space Farmers at the University of Alicante; Ficosterra at the University of León; and Xtrem Biotech at the University of Granada.

Moreover, the [National Center for Food Safety \(CNTA\)](#) has opened its new headquarters in Madrid, where it will work with the support of Mercamadrid to promote innovation and add value to agri-food companies in the capital.

Main technology parks and institutes developing Foodtech in Spain.

Universities & technology parks

Basque Culinary Center	Parque (Euskadi Technology Parks)
ESADE Creapolis	Parque Científico de Alicante
ETSIAM-Universidad de Córdoba	Parque Científico de Madrid
Fundación Aula Dei	Parque Científico Tecnológico de Almería
IMDEA Alimentación	Parque Científico Tecnológico de Cartuja
Instituto Tecnológico de Murcia	Parque Científico Universidad Carlos III de Madrid-Leganés Tecnológico (UC3M)
Parc Científic de la Universitat de València	Parque Científico y Tecnológico de la Universidad Politécnica de Madrid
Parc UPC - Universitat Politècnica de Catalunya - BarcelonaTech	Parque Tecnológico de Galicia-Tecnópole

Source: prepared by the author

CIENCIA E INNOVACIÓN PARA LA RECUPERACIÓN: La propuesta del sector biotecnológico. Asebio: <https://www.asebio.com/sites/default/files/2020-10/Propuesta%20AseBio%20IDI%20para%20la%20recuperaci%C3%B3n.pdf>

2 Spain's Foodtech Ecosystem

Industry: Increasingly involved in driving foodtech innovation

Spanish food companies are leading the way in the development of technologies to ensure a sustainable food system.

They do this through programs with the most promising international startups, as is the case with [Pascual](#) and Mylkcubator, the incubator launched by its open innovation vehicle Pascual Innoventures. This is the first global incubator to work with projects developing solutions for the dairy industry through the application of cellular agriculture.

Internal innovation is also being developed in Spanish companies, for example, [Nueva Pescanova](#) is developing the first octopus bred in aquaculture. This is not surprising considering the importance of the fishing sector in Spain, which has the biggest aquaculture production in Europe.¹

The frozen bakery giant [Europastry](#) is combining both types of innovation, internal and collaborative with other agents from its innovation centre Cereal, where it works to innovate new products. They launched the incubation program Baking the Future where they work with national and international startups to help them scale their solutions.

¹ Aquaculture in Spain 2020, Apromar: <http://www.apomar.es/content/informes-anales>

INDUSTRY

Innovative Food Companies in the Spanish food sector

COMPANY

[Aldelís](#)
[Angulas Aguinaga](#)
[Pascual](#)
[Campofrío](#)
[CAPSA](#)
[Cidacos](#)
[Coren](#)
[COVAP](#)
[DACSA](#)
[Damm](#)
[Estrella Galicia](#)
[Europastry](#)
[Familia Torres](#)
[IAN Group](#)
[Incarlopsa](#)
[Siro Group](#)
[Iberfruta](#)
[Mahou- San Miguel](#)
[Mercadona](#)
[Nueva Pescanova](#)
[Palacios](#)

ACTIVITY

Startup investment
Open Innovation Programs
Investment branch+ startups incubator
Open Innovation Programs
Startups investment
Open Innovation Programs
In-house research centre
Open Innovation Programs
Startups investment
Open Innovation Programs
In-house acceleration programme
Startups incubator
Open Innovation Programs
Open Innovation Programs
Open Innovation Programs
In-house research centre
Open Innovation Programs
In-house acceleration programme
In-house acceleration programme
In-house research centre
Open Innovation Programs

Source: prepared by the author

2 Spain's Foodtech Ecosystem

Innovation hubs, incubators and accelerators drive the creation and growth of Foodtech startups

The incubators in the Spanish ecosystem are internationally recognized, as is the case with Culinary Action! the entrepreneurship area of the Basque Culinary Center, which has won the European Enterprise Promotion Awards 2021.

[Spain FoodTech Startups Program](#), supported by ICEX and CNTA, has attracted more than 200 start-ups, applying for the first edition the program. These include foreign entrepreneurs looking to establish their headquarters in Spain from other countries.

We also observed the birth of new incubators at the national level focused specifically on Foodtech, such as [Forward Fooding](#) which powered the Food & Food Tech Innovation Hub in Barcelona, hosted by Talent Garden.

In 2021, Spanish technology company Glovo and [Lanzadera](#), Juan Roig's business accelerator in Valencia, have signed a national agreement to revolutionize the delivery and catering sectors, by providing training to entrepreneurs and offering special conditions and tools to startups that collaborate with the app.

After three editions between Spain and Brazil, [TheHop](#), Estrella Galicia's open innovation ecosystem, has evolved and grown from a Collaborative Entrepreneurship Program to an Open Innovation Ecosystem.

INCUBATORS & ACCELERATORS

Main accelerators / hubs in the Spanish food sector

AGENCY	FOCUS	CAPITAL
Bar Lab	Rest Tech	Corporate
Business Food Factory	Agri-foodtech	Public agency
Cereal	Agri-foodtech	Corporate
Culinary Action!	Agri-foodtech	Academic institution
Eatable Adventures	Agri-foodtech	Private
EIT Food	Agri-foodtech	Government agencies + businesses
Fishing Tech	Agri-foodtech	Private
Forward Fooding	Agri-foodtech	Private
Ivoro Food Innovation Hub	Agri-foodtech	Private
Km Zero	Agri-foodtech	Corporate
Lanzadera	General	Corporate
Orizont	Agri-foodtech	Public agency
Porcinnova	Agri-foodtech	Public agency
Spain Foodtech	Agri-foodtech	Private + Public Collaboration
The Hop	Rest Tech	Corporate
Valhalla	General	Private
Wayra	General	Corporate

Source: prepared by the author

2 Spain's Foodtech Ecosystem

Foodtech enablers in Spain

In the last year, the importance of Foodtech for the country has become evident, as events focused on giving visibility to the Foodtech sector have emerged. This is the case with [Food4Future](#), and others that have become a reference in the sector such as [F Talks](#). Given the importance of plant-based diets, events such as Veggie2Business, Beveggie and VeganaGal have emerged at the national level to bring together all the agents working in this line.

Additionally, KM ZERO Food Innovation Hub presented the [Fooduristic '21](#) report, as part of one of the Fooduristic Meetings it is promoting through its Fooduristic, in order to reflect the shift that the food industry is experiencing.

Another example is the [Food Design Festival](#) that took place in 2021, the 1st Contemporary Festival to explore the value of design and its relationship with food.

International fairs like [Fruit Attraction](#) and [Meat Attraction](#) are including technologies applied to the food value chain, with dedicated areas like the Biotech Attraction conference cycle and the Innovation Hub which brings together all product innovations.

The innovative food fair [Alimentaria](#) will take place in 2022 with a special edition entirely dedicated to the Foodtech sector.

Main Foodtech Events un Spain

EVENT	LOCATION
Alibetopías	Madrid
Alimentaria Foodtech	Barcelona
Biospain	Pamplona
Datagri	Zaragoza
F Talks	Valencia
Food 4 Future	Bilbao
Food Design Festival	Madrid
Foodture	Barcelona
Fruit attraction	Madrid
Gastroemprendedores	National
Hospitality Innovation Platform (HIP)	Madrid
Meat attraction	Madrid
Salón Gourmets	Madrid
Smart AgriFood	Málaga
Startup Olé	Salamanca
Trend Builders	Barcelona
Veggie2Business	Madrid

Source: prepared by the author



3 Spain's Foodtech startups



3 Spain's Foodtech Startups

Startups: Championing innovation in the food system

Technological strength is key to the proper development and competitiveness of Spanish Foodtech startups in the global market. According to a study by Eatable Adventures, 30% of Spanish startups have a patent for their technology and 33,7% have a trade secret.

During 2021, the percentage of startups developing their technology internally increased. In this area, we have registered an increase in the use of biotechnology to achieve solutions that guarantee more efficient and sustainable production, as well as the use of artificial intelligence to increase efficiency in aspects such as product design and automation.

In particular, 32,05% of startups in the field of foodtech are using Biotech in their developments, compared to 24,73 %in 2020. Artificial intelligence has also experimented a growth from 23,66% in 2020 to 28,21% in 2021. Both technologies have experimented a big increase, as well as machine learning, going from 20,43% in 2020 to 24,36 % in 2021, which shows the increasing implementation of automatization in the sector.



Deep Techs employed 2021

TECHNOLOGY	PERCENTAGE	VARIATION
Biotech	32,05 %	▲
Artificial Intelligence	28,21 %	▲
Machine Learning	24,36 %	▲
IOT	15,38 %	▼
Blockchain	12,82 %	▲
Robotics	6,41 %	▲

Source: Eatable Adventures, 2021

The State of Foodtech in Spain (2021). Eatable Adventures: <https://www.eatableadventures.com/report-eng-2021/>

3 Spain's Foodtech Startups

Startups: Championing innovation throughout the value chain

The distribution of Spanish Foodtech projects became more balanced along the value chain, especially due to the growth of projects located in agriculture, from 17% in 2020 to 24% in 2021. The main area, at 24%, for this year's leading projects is product innovation; this includes everything related to new ingredients: from their production to the transformation of finished products. This is closely followed by the "Direct to Consumer" models at 22% and, finally, digitization in the field, at 12%.

Percentage of foodtech startups by area of the agri-food value chain



Ranking by global areas

24%

PRODUCT INNOVATION

Including products and alternative origin ingredient sources

22%

DIRECT TO CONSUMER MODELS

Online sales, meal kits, digital native brands, new generation vending, etc.

12%

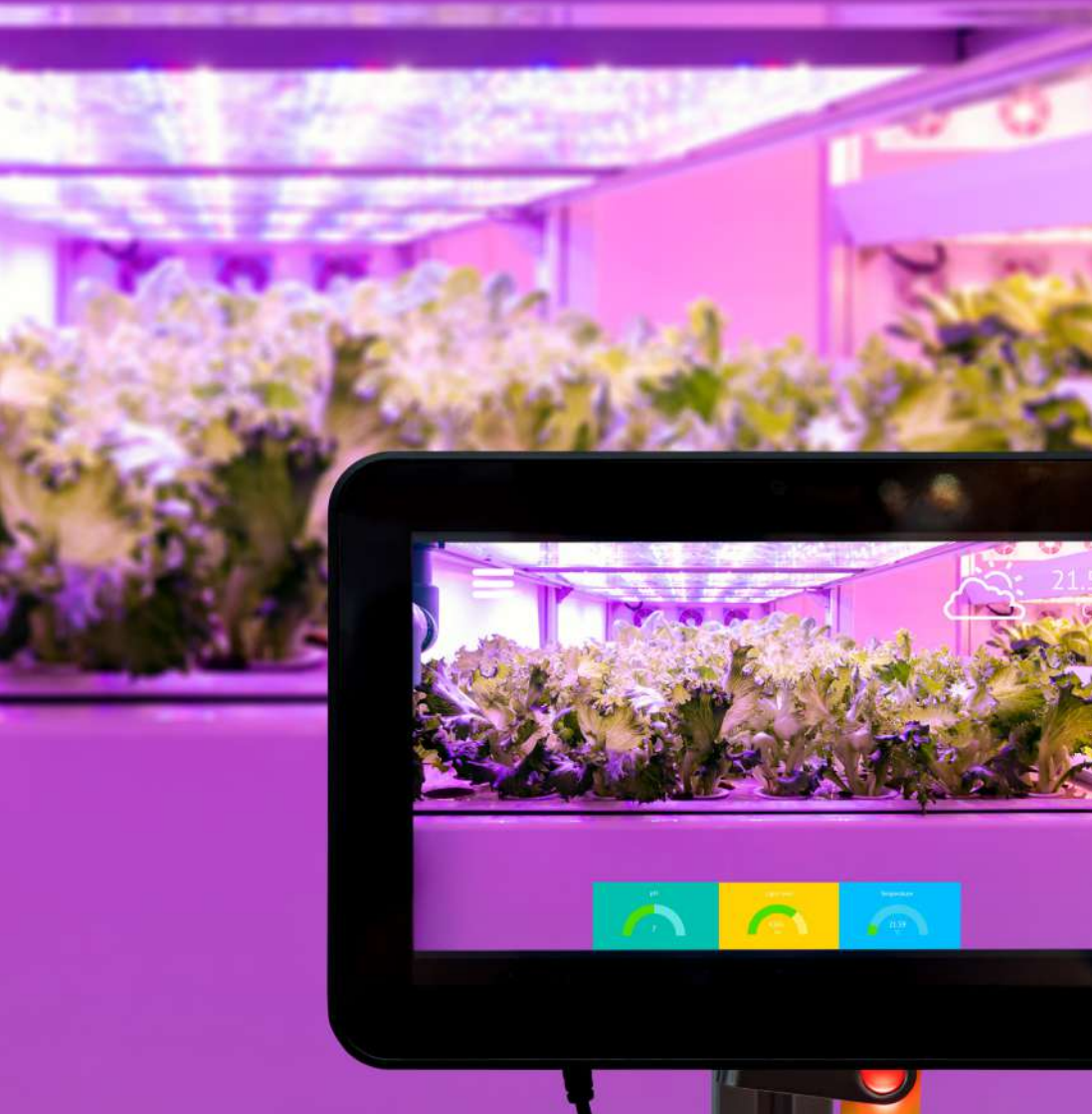
FIELD DIGITALIZATION

Including software, hardware, robotics and marketplaces.

Source: Eatable Adventures, 2021

The State of Foodtech in Spain (2021). Eatable Adventures: <https://www.eatableadventures.com/report-eng-2021/>

3 Spain's Foodtech Startups



Startups: championing innovation throughout the value chain

In analyzing the Spanish Foodtech ecosystem, we have looked at startups working from the beginning to the end of the value chain.

If we look at the startups involved in Agritech, we find many crop automation solutions, which account for 36% of the total in Agritech, followed by new cultivation systems, with 18%.

In transformation, consumer packaged goods (CPGs) developed with novel ingredients increased from 42% in 2020 to 47% in 2021, followed by startups working on new ingredient sources, such as plant-based, fermentation and cellular that account for 24%.

Among the solutions for food distribution to the final consumer, Spain is a world leader in delivery as a result of the success of Glovo. The category of direct-to-consumer models is the overwhelming leader in the distribution and retail category, at 75%.

In the restaurant tech section, the development of tools for the digital management of restaurants grew in the last year from 22% to 40% of startups.

Below is a map of the main Spanish Foodtech startups, selected by degree of investment and innovation, placed in the different phases of the chain, according to our own taxonomy.

(Taxonomy description available on page 6).

3 Spain's Foodtech Startups

Startups: championing innovation throughout the value chain

FOODTECH

Agritech



Foodtech: Food production and transformation



Foodtech: Logistics, distribution and retail



Restaurant Tech



New entries





4 Invest in foodtech in Spain

4 Invest in foodtech in Spain

Foodtech: A sector on the rise

The Agrifoodtech sector has shown its great potential in the last year, breaking records in global investment with **\$24 billion** in the first half of 2021 – very close to the total for all of 2020. During 2020, this sector accounted for **\$30 billion, 34.5%** growth over 2019.

In Europe, we have seen a shift in investment, surpassing the investment at the beginning of the value chain for the first time ever.

Covid has shown the inefficiencies of the system and consumers are increasingly more concerned about the origin of the food they eat. It has also changed the way of shopping; with online taking a bigger role than ever before.

According to Dealroom, of the **€2.4 billion** invested in Europe in **2020, €1.1 billion** was invested in startups

working in transformation. This part of the value chain includes protein alternatives, which are gaining special traction in the market.

Within the downstream area, the investments are being made in quick store.

Spanish startups have managed to raise a total amount of 695M€; three times the total invested in 2020.

Glovo has accounted €450 million in the last year. The growth of **220% of investment** in this ecosystem is largely due to this startup, but also to investments in alternative proteins and in the digitalization of agriculture.



Credits:Biotech Foods

AgFunder AgriFoodTech Investment Report(2021) AgFunder: <https://agfunder.com/research/2021-AgFunder-agrifoodtech-investment-report/>

The State of European Food Tech 2021 (2021) Five Seasons Ventures&Dealroom: <https://foodtech.vc/>

Data Snapshot, Ag Funder (2021): <https://agfundernews.com/agrifoodtech-investment-set-to-far-outpace-2020s-record-breaking-levels-hits-24bn-in-h1.html>

4 Invest in foodtech in Spain

Invest in Foodtech in Spain

The Spanish ecosystem is attracting investment.

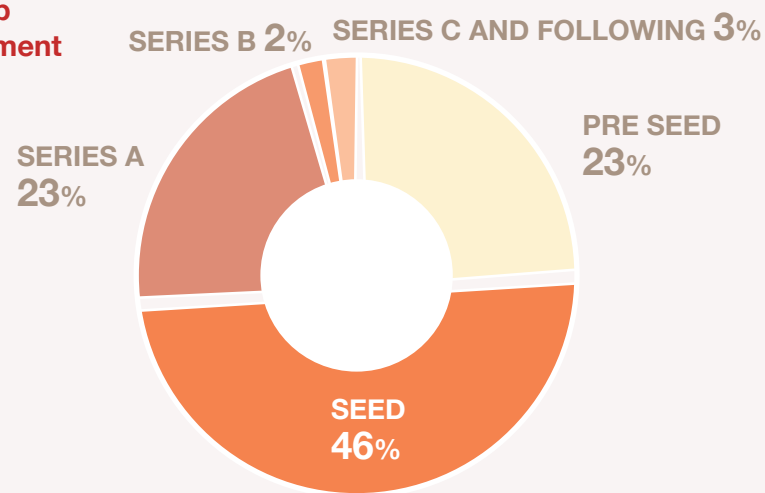
Spanish startups have attracted investment in 2021 that has allowed this ecosystem to access more mature investment rounds; so the number of earlier series has been reduced and the number of series A and B have increased.

Higher investment rounds are observed even in the early stages of startups. This culminated in a total investment of €695 million in 2021, with an increase in investment of 220% from 2020 and 101% from 2019, which highlights the great potential of this ecosystem. It is worth noting that in 2020 the delivery startup Glovo obtained no investments.



The State of Foodtech in Spain (2021). Eatable Adventures: <https://www.eatableadventures.com/report-eng-2021/>

Startup investment stage



AVERAGE INVESTMENT RECEIVED €1.6 MM

Source: Eatable Adventures, 2021

ROUND SIZE

	2021	2020
From 1€ to 100.000€	18,64 %	20,69 %
From 100.001€ to 250.000€	22,03 %	22,41 %
From 250.001€ to 500.000€	22,03 %	31,03 %
From 500,001€ to 750,000€	5,08 %	6,90 %
From 750,001€ to 1,000,000€	1,69 %	1,72 %
From 1.000.000€ to 2.000.000€	10,17 %	6,90 %
More than 2.000.001€	20,34%	10,34 %

Source: Eatable Adventures, 2021

4 Invest in foodtech in Spain

Invest in Foodtech in Spain

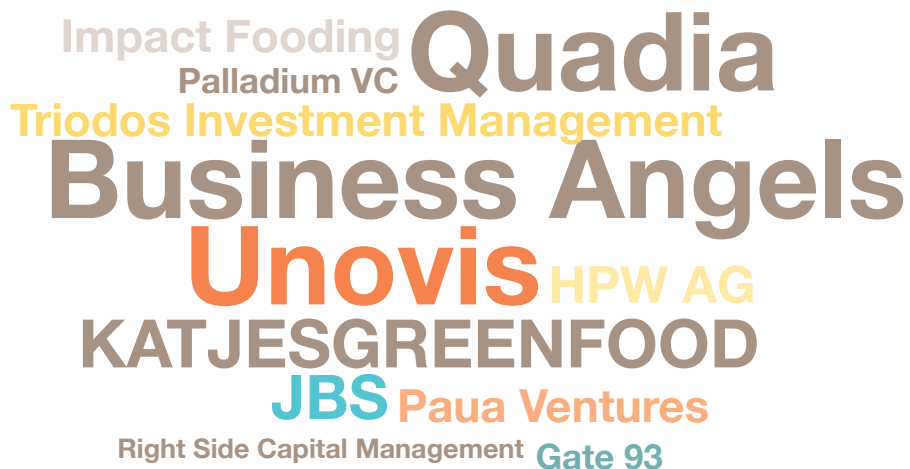
Analyzing in detail the main investors and the volume of the rounds, we can see that FFF are still the most common investors in pre-seed and seed series, but we can also observe rounds above €1 million and the entry of both national and international investment vehicles.

As we mentioned before, round sizes have increased since last year and specialized funds in foodtech have emerged in the country including Eatable Evolution Fund and TechTransfer Agri Food.

National Public Investors



International Private Investors



National Private Investors



The State of Foodtech in Spain (2021). Eatable Adventures: <https://www.eatableadventures.com/report-eng-2021/>

4 Invest in foodtech in Spain


Invest in Foodtech in Spain

If we look at the main rounds of 2021, it is not surprising that [Glovo](#) – with technology applied in the downstream value chain segment – tops the list with a **€450 million round**, the largest in history for a Spanish startup. Regarding this foodtech unicorn, at the end of December Delivery Hero signed an agreement to become its majority shareholder.

Next is [BioTech Foods](#), a startup that has been majority acquired by the world's largest meat producer, JBS; followed by another company that is working in the world of alternative protein, [Heura Foods](#), which continues its international expansion and product launches across its portfolio. Heura raised the **20% of the 16M€** round by attracting €4 million within just 24 hours of launching its campaign on the crowdfunding platform Crowdcube.

After these two companies we find the investments in [Biome Makers](#) and [Crowdfarming](#), both working on the digitization of the field. The first does this by improving soil quality through the study of the soil; while Crowdfarming offers direct purchases to local producers, already exporting to different countries all over Europe.

2021 RANKING ROUND SIZE

	450 M€
	36 M€
	16 M€
	15 M€
	15 M€

Source: prepared by the author.



5 Spain, foodtech nation



5 Spain, foodtech nation

The potential of the Spanish Foodtech ecosystem is due to several lines of action in which the agents present in this report are working to position Spain as a leading country in Foodtech.

The combination of technology and gastronomic culture are the ideal combination for a healthy, sustainable food recognized worldwide for its flavour.

The following is an analysis of some of the main actions that have taken place over the last year in these areas:

- **Fueling the development of alternative proteins**
- **Development of healthier and more sustainable ingredients**
- **Driving a more efficient and sustainable agri-food system**
- **Transparency and traceability in the value chain**
- **Gastronomy and Foodtech join forces to provide solutions**
- **The reinvention of foodservice**

5 Spain, foodtech nation

Leading the wave of alternative protein

The Spanish alternative protein market has grown exponentially, being one of the most active in the ecosystem.

The rapid growth of Spanish plant-based market, is due to the actions of innovative players in the ecosystem, including big companies, technological and research centers, and disruptive startups.

Aside from its developments in the plant-based market, Spain is committed to scale technologies that will allow the country to fuel the development of more sustainable and tasty alternatives. These technologies are being applied both for dairy products, like the Mylkubator program by [Pascual](#), for meat products with the acquisition of [Biotech Foods](#) by the meat producer JBS and the highly realistic 3D printed plant-based seafood developed by [Cocuus](#) startup.

In the last year the application of biotechnology has played a huge role in the development of solutions for producing sustainable protein sources. As predicted in the previous report, fermentation is gaining traction in the market, with new startups working in the area of precision fermentation and biomass (mycoprotein). [MOA Foodtech](#) is one Spain's latest and most promising startups, using food waste and by-products from the food production as raw material to create proteins to be used in different food industry lines.

New sources of protein like algae or insects are gaining scalability, through factory expansion, this is the case with the microalgae producer [Algaenergy](#) and the insect producer [Tebrio](#).

Heura Foods is leading the plant-based revolution, and has recently closed an investment round to continue its international expansion and is already one of the most popular alternatives in Europe.



Credits: Heura Foods

*This sector is analysed in more detail in section 6 of this report.

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Development of healthier and more sustainable ingredients

Consumers are constantly looking for products using healthier and more sustainable ingredients. Several Spanish startups have been focusing on this sector to bring healthy solutions to customers.

Personalized precision medicine is an opportunity to develop an industrial sector of high strategic, health, scientific and economic value. Spain is among the European countries with the best conditions for promoting personalized precision medicine in the future and integrating this new way of understanding healthcare into the health system.

An ingredient startup that has made extraordinary discoveries is [Baia Food](#). The Spanish foodtech startup is focusing on Miraculin, the bioactive glycoprotein found in the berry pulp, which makes sour and acidic foods taste sweet. It has finally obtained approval by the European Commission to be commercialized for human consumption.

Another way of improving the nutritional value of food products is by using healthy fats. There are two innovative startups, [Cubiq Foods](#) and [Healthy Food Iberica](#), which have developed their solutions Go! Drop and Verdeo to be applied in different food products.

The supplements market has been improving the quality of ingredients used. [Aldous Bio](#), a young Spanish startup, offers products made with high quality ingredients, taking into consideration the preservation of the environment. Another startup in the same field is [Healthinfoods](#), making food supplements manufactured with 100% natural bioactive ingredients. [Ingredalia](#) is another startup working in the field, developing natural functional ingredients from vegetable by-products.

And last but not least, [Nucaps](#) is also working in this area, with its unique nanoencapsulation technology for bioactives and probiotics.



Baia Foods miraculin is turning acid into sugar, allowing the design of low-sugar products.

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Driving a more efficient and sustainable agri-food system

It is a general goal to make the agri-food system more efficient and sustainable, especially in a post-pandemic world.

One of the solutions to achieve this, is indoor or vertical farming. Vertical farming is a form of agriculture specifically designed for vertical structures.

Vertical farming is a more sustainable agricultural method. It requires much less water than traditional farming since a portion of the water can be recycled and reused, and less water is lost due to evaporation. Also, indoor farming does not require the use of pesticides or herbicides that are potentially very damaging for the environment.

Thanks to the controlled conditions provided by vertical farms, crops can be cultivate all year-round in any climate. Vertical farms are often located in urban areas, which can offset transportation issues, with shorter traveling distance, keeping produce fresher and reducing CO2

emissions. Examples of Spanish startups revolutionizing indoor farming are [Ekonoke](#) and [H2Hydroponics](#).

Another way of promoting sustainable farming practices is through soil analysis. [Biome Makers](#) has recently received \$15 million in Series B funding that will go towards the company's next phase of growth, accelerating the global expansion of BeCrop® as the industry standard for functional soil analysis and sustainable soil health recovery, and Gheom® as an independent assessment program measuring the impact of crop inputs and farming practices to support personalized agriculture. Innovative international startups are being established in Spain to develop products that can help in the development of a more efficient and sustainable agri-food system. This is the case with [Zoomagri](#) and [Auravant](#), two Argentinean startups that are applying high tech technology to increase efficiency in quality control and productivity in agricultural development.



Credits: Carmen Prieto Remón— for Ekonoke

Ekonoke's proprietary growing methods and technology can produce local hops all year-round, guaranteeing 100% climate resiliency and, 95% less water footprint, using only renewable energy, pesticide free, with up to 52 harvests per year.

5 Spain, foodtech nation

Transparency and traceability in the value chain

Spain is home to several high-quality products recognized throughout the world, such as ham and wine. These are traditional foods that are the pride of the country and represent part of the beautiful Spanish culinary heritage internationally.

However, these types of premium products also come with a greater responsibility to inform consumers and reassure them that the items are up to the expected standard. There has also been growing concern among consumers regarding where their food comes from. Thanks to modern traceability and transparency technology, especially blockchain, it is now possible to provide this information.

The need for traceability touches several sectors in agrifoodtech including food, farming and agriculture.

Several Spanish startups are finding solutions to these needs, focusing on different moments of the value chain. Some ensure that the product is safe from the very beginning of the chain.

For example, [Digitanimal](#) have a scale that can help keep track of the animals' health and detect diseases

early on. However, other startups such as [FoodXain](#) provide the actual QR code that can be placed on the finished product label for the consumer to explore the journey.

[ASICI](#) (Interprofessional Association of Iberian Pork) and [ANICE](#) (Association of Meat Industries of Spain) are playing a big role in the country regarding the traceability of meat. In the area of aquaculture, [Acuiplus](#) is actively applying blockchain technology to trace seafood production efficiently.

Spain is among the top three countries for the value and volume of wine, alongside Italy and France.

The Grapetrust project developed in Spain can be explained as 'the internet of things in the vineyard'. The project began a few years ago with the challenge of offering maximum traceability information to customers.



Ham producer Navidul is using blockchain technology applied to traceability. By scanning a QR code, consumers have access to data such as the pig's diet, where it has been cured, the final weight of the piece or the best-before date.

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Gastronomy and Foodtech join forces to provide solutions

Spain is on its way to becoming a world reference in foodtech, and that includes innovating in the gastronomy sector.

We see this with **Novameat**, a Spanish startup using 3D printing technology to create whole-cuts of plant-based meat, such as beef steak and pork fillets. It is currently being supported by the Spanish government via a €250,000 grant. This news came with the announcement of a collaboration with Disfrutar, a two-Michelin star restaurant ranked as the 9th best in the world. **Disfrutar**'s chefs belong to the same culinary creative team as early molecular gastronomy pioneering restaurant El Bulli.

In other news, **Spanish chef Ángel León's** "sea cereal" received the National Award for Gastronomic Innovation 2021, awarded every year by the Royal Academy of Gastronomy. This marine cereal (zostera seeds) is a new ingredient grown in an estuary in the Bay of Cadiz and could be a viable alternative to traditional cereal. This discovery is set to revolutionize food, and starting in 2022, it will be planted in seven seas in different parts of the world to analyze its development and behaviour in other areas.

The well-known **Spanish chef José Andrés** has started collaborating with the startup Eat Just, the first to receive approval for commercialization of lab-grown chicken in Singapore. The chef will be giving advise on the gastronomic part of the project.



Credits: Paolo Verzone – VU for TIME

5 Spain, foodtech nation

The reinvention of foodservice

Food delivery services have experienced an increase in business as a result of the pandemic as the circumstances forced the acceleration of the digitization process for restaurants.

Delivery companies have to ensure a robust infrastructure to carry out all the deliveries. The expectation is that, in a post-pandemic world, deliveries will continue to be popular among consumers.

The disruption caused by this situation was to shorten delivery times, with some being as low as 10 minutes. In the Spanish market, local players like [Kubbo](#) are competing with international startups such as Gorillas.

When it comes to the use of Artificial Intelligence applied to foodservice, the Spanish startup [Proppos](#) is an outstanding example.

Proppos uses computer vision and deep learning algorithms for an autonomous self-checkout, without the need to scan products, enhancing the customer and shopping experience.

The pandemic also sped up the growth of dark kitchens and stores. Dark kitchens are areas used by restaurants for cooking that are not open to the public; strictly for delivery or takeaway. Following the same concept, dark stores are storage spaces with products intended for delivery.

An example of a successful dark kitchen business in Spain is [Avanza Food](#). Avanza Food is developing plans for its Dark Kitchens & Virtual Brands division, a multi-brand restaurant that will operate with up to 8-10 brands from its entire portfolio, exclusively through takeaway or delivery.

Dark stores were adopted by startups and big retailers. In Spain, the supermarket chain [Dia](#) adapted their logistics, favoring the mixed model of distribution from 'mini dark stores', streamlining last-mile distribution and providing the operation with flexibility and efficiency. Dia has also been an example of the new ecosystem of physical-digital channels. Other larger supermarkets that have joined the dark supermarket industry are [El Corte Inglés](#) and [Mercadona](#).



Credits: El Confidencial

Blok developed a system to deliver supermarket orders in 10 minutes. Its business model was impressive enough to be sold in just a few months since its inception in February 2021 to the Turkish delivery giant Getir.



6 Alternative Proteins in Spain



6 Alternative proteins in Spain

How the market is evolving: Introduction

The global alternative proteins market is estimated to grow by seven times over the next decade, from about 13 million metric tons consumed in 2020 (about 2% of the total animal protein market) to approximately 97 million metric tons by 2035 (reaching 11% of the overall protein market).

This estimation takes into consideration the following types of alternative proteins: plant-based, microorganism-based, and animal cell-based.¹

The alternative protein industry in Spain has been growing exponentially in the last few years showing the potential we have in this new market as well as highlighting the opportunities and challenges to be faced in the next years by the industry.

Regarding the sales in the plant-based sector, after Germany (817M€), Spain represents Europe's second-most prominent country with **448M€ sales**, ahead of other leading EU economy countries like Italy (425M€), France (355M€), The Netherlands (291M€), and Belgium (134M€).²

To ensure the success of the development of these alternatives, solid research and technological development in this field is crucial, alongside relevant investments by both the private and public sector.

The rapid growth of Spanish plant-based market, is due to the actions of innovative pla-

yers in the ecosystem, including big companies, technological and research centers, and disruptive startups such as [Heura Foods](#). Heura is leading a revolution against meat consumption and has contributed to this category's evolution by having exceptional marketing and community engagement. It has expanded internationally, and is one of the fastest-growing plant-based startups in Europe in 2020.

Aside from plant-based solutions, there are technologies such as fermentation, bioprinting, and cell cultivation that are captivating investors' interest.

Fermentation consists of protein production using microorganisms as factories. Bioprinting is being used to mimic the structure of animal products with a non-animal composition. Finally, cell cultivation is applied to reproduce animal cells as an alternative to killing them for their meat.

This combination is what sets Spain apart from other countries, as it has a network of technology centres working on the development of products that meet both sensory and nutritional expectations.

In this section, we will explore Spain's potential in the development of alternative proteins with a compilation of the various agents working in this area.

¹ Food for thought: The Protein transformation (2021) Blue Horizon & BCG: <https://www.bcg.com/publications/2021/the-benefits-of-plant-based-meats>

² Plant-based foods in Europe: How big is the market? (2021) Smart Protein Project: <https://smartproteinproject.eu/plant-based-food-sector-report/>

6 Alternative proteins in Spain

How the market is evolving: Meat alternatives

Despite accounting for only 3% of Spain's €28 billion traditional meat industry (the fourth largest manufacturing sector in the country), meat alternatives are the fastest-growing category.¹

Not surprisingly, meat companies are playing a big role in the distribution of these alternatives and traditional meat producers like Campofrío, El Pozo and Noel, have incorporated plant-based products in their current portfolios.

Moreover some other such as, **Zyrcular foods**, founded by meat producer Vall Companys, built the first factory dedicated exclusively to the production of alternative proteins, which has enabled them to distribute national and international alternative protein products. More competitors are moving into this alternative meat field, including the manufacturer DACSA, which has just built the Pésol Pea plant, the first wet textured protein plant in Spain.

Some other big players in plant-based production, such as **Newind foods** – which emerged from a collaboration between the companies Aviko and Eurofrits – produce 100% plant-based products in a new facility with three production lines, and a production capacity of 18,000 tonnes per year.

Meanwhile, researchers are also working on developing these solutions.

Leggie, a startup that has emerged from a CSIC investigation center produced a plant-based meat analogue that has less saturated fats and more fiber. Likewise, the

research center CTIC CITA has also created an analogue to meat, **VEGGIAN®**, and has expanded its protein texturization pilot plant to include wet extrusion for their development.

A new technology that has advanced in Spain, especially in this field at a technological level, is bioprinting. Although being in various development stages, two of the most relevant startups in the use of this technology are –amongst others – :

Cocuus has developed a technology platform whose objective is to create food production solutions by the application of bioprinting, with a broad application in alternative proteins, including steak, shrimp, tuna, oysters and salmon.

Novameat, a startup that emerged from research at the Polytechnic University of Catalonia, transfers biomedical knowledge to the production of fillets by bioprinting. This startup has already been working with well-known chefs from Disfrutar restaurant (which has two Michelin stars) to improve their products in restaurants.

Cocuus is one of the startups using bioprinting to produce any analogue of animal protein.



Credits: Cocuus

¹ Plant-based foods in Europe: How big is the market? (2021) Smart Protein Project: <https://smartproteinproject.eu/plant-based-food-sector-report/>

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How the market is evolving: Meat alternatives

Another technology emerging in Spain over the last few years is cultured meat, and is still in growing and expanding development.

An example of this is CULTUREDMEAT, a project arising from a collaboration between Argal, [Biotech Foods](#), Martínez Somalo, DMC Research, BDI Biotech, Neoalgae, BTSA, and Agrowingdata, and as well as technological and research partners, Ctic Cita and Tecnalía.

Spanish chefs are also part of the development of these new meat alternatives, such as the world-renowned José Andrés, who joined the Board of Directors at GOOD Meat, the cellular agriculture arm of California-based Eat Just, and will be serving cell-cultured chicken in his US restaurant as soon as it gets legal approval.

And, last but not least, fermentation is one of the technologies highly adopted by several companies in Spain for creating animal-based proteins showing the potential this technology has in both precision fermentation and mycoprotein.

The application of these technologies plays an important role in the future of meat production as they are meant to revolutionize the meat value chain as we currently know it. In this promising scenario, new startups have emerged to develop meat-free solutions with mycoprotein.

One of these is [Innomy](#), an Argentinean startup that moved to Spain in collaboration with the technological center CNTA.

As well as, [Libre Foods](#) and, [ODS Protein](#), two Spanish startups exploring the potential of this nutritious and sustainable protein.

These startups show huge market potential as meat alternatives, as they offer a product with similar nutritious composition to animal proteins, but without the sustainability concerns that meat production has.

Innomy is applying fermentation using different strains of mushrooms to generate high protein foods that are totally healthy, incredibly delicious, sustainable and cost efficient.



Credits: Innomy

6 Alternative proteins in Spain

How the market is evolving: Dairy alternatives

Spain is the leader in per capita sales volume of plant-based milk in Europe, with the categories dominated by oat (125M€), followed by soya (91M€) and almond (57M€). Oat milk has the strongest sales growth in the overall market (25%), as well as in discount stores (49%).¹

Key players in this territory include large Spanish dairy industries such as Pascual – Vivesoy plant-based brand– and CAPSA Food, – which markets Alpro. Liquats Vegetals, the first local manufacturer of milk substitutes and owner of the high-quality Yosoy brand, is rapidly gaining market shares thanks to its strong commitment to clean labels and additive-sugar-free alternatives.

Within the startups ecosystem, many promising players are offering plant-based alternatives to traditional dairy products. This is the case with [Väcka](#) and [Vegetaleso](#) which are developing cheese made from nuts, and plant-based ice cream maker [Pink Albatross](#).

These alternatives are being supported by public institutions, as is the case with the FerVelact project, backed by IVACE and developed by the AINIA technological centre, resulting in plant-based alternatives to dairy products using regional plant-based resources. Additionally, advanced fermentation technologies are being used to ensure the production of mimetics at a nutritional and sensory level as an alternative to traditional dairy products.

Spain's largest dairy companies are making their moves to keep their leading position in the field, as well as creating new opportunities for foreign companies.

The French company Danone is aiming to expand its plant-based food production facility in Spain, and have invested 12M\$ to be able to meet consumer demand.

Also, Pascual Innoventures, part of the Spanish dairy company Pascual, has launched the first global incubation program for cellular agriculture technologies in the dairy industry, Mylkubator. This corporation has already selected 4 of the most disruptive worldwide projects working in this area and is helping them develop their innovative projects, along with other partners like Eatable Adventures and CNTA.

Mylkubator program, the first-ever global incubation program for cellular agriculture projects in the dairy spectrum



¹ Plant-based foods in Europe:How big is the market?(2021) Smart Protein Project: <https://smartproteinproject.eu/plant-based-food-sector-report/>

6 Alternative proteins in Spain

How the market is evolving: Fish alternatives

Even though it remains in the early stages, vegan fish and seafood is another category of interest in Spain; with high development potential, given the importance fish has in the Spanish diet.

There are already several Spanish startups developing seafood alternatives, and we expect to see more in the coming years.

For example, the frozen food retailer La Sirena was the first company to distribute plant-based fish analogues from its Veggirena brand. They have created cod and hake flavored hamburgers made from alternative protein.

Likewise, [Mimic Seafood](#) uses Fingerino – an exclusive variety of tomato (developed by another Spanish brand), whose shape and texture make it easy to mimic tuna – creating its plant-based tuna.

Lastly, [Sun-Rose Invest](#), is the new official distributor (based in Madrid) in the Spanish market for Vegan Zeastar’s “Vegan Sashimi” and “No Tuna” and “No Salmon”

Meanwhile, 3D printing is being used to create more realistic fish alternatives, which is the case with [Co-cuus](#), a startup that is developing an identical alternative to different seafood products such as salmon, canned tuna, and oysters.



*Mimic Seafood Raw
Vegan Tuna Made Out Of
Tomatoes.*

6 Alternative proteins in Spain

How the market is evolving: Building capabilities

During 2021, developments in the Spanish alternative protein ecosystem have been scaling technologies to increase production capabilities, with an intention to lead the production of these alternatives internationally.

BioTech Foods, the first cell-based company in our market, has closed an investment operation of €36 million with the meat giant JBS (the largest meat company in the world). This injection of capital will serve to build Guipuzcoa's first industrial plant for cultivated meat products in Spain by 2024.

MOA Foodtech, founded in 2020, has recently received its first investment of €1.5 million to advance its technology. Currently, the startup is working with leading companies in the food sector, such as the Italian pasta producer Barilla, in a collaboration to reuse food waste from its production line.

Algaenergy, the microalgae biotechnology producer, has recently expanded its shareholding, which will allow it to increase the production capacity at the AlgaEnergy production plant located in Cádiz, to promote its development in new international markets and accelerate the development of new applications. This microalgae plant is capable of biofixating CO₂ in the microalgal cultivation process, thus transforming this gas into high-value products.

These latest moves show that alternatives proteins are scaling in the market and will soon become as competitive and superior in taste to current products.

Spain has the potential to become a sandbox to develop the most disruptive technologies in the food value value chain.



The biotechnological company Tebrio, will allocate €50 million for its plant in the production of insects for animal feed, manufacture of fertilizers and for medicinal and cosmetic uses.

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Moving Spanish
Food System Forward

