



Foodtech in Spain

Addressing new
challenges
across the food
value chain



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and Investment

Dear reader,

It is a pleasure to present the 2022 report on the FoodTech sector in Spain. When we decided to tackle this project three years ago, we felt it was important to let the world professionals know the effort the Spanish food industry was making to build a more innovative and sustainable value chain, giving a response to the challenges faced by the industry worldwide. At the same time, the report also intended to mark the path to Spanish companies, signaling that a profound commitment to innovation is needed to guarantee our leadership at the international arena and our alignment with the Sustainable Development Goals (SDGs).

As this report shows, the year 2022 closes with tremendously positive figures for the Spanish FoodTech sector. The ecosystem is rapidly getting consolidated with the entrance of new operators. Moreover, in a context of falling investment in the FoodTech sector at a global level, investments in Spain have increased by an outstanding 9.38%, reaching €268M.

In this year's edition we have focused on the surge of technologies linked with traceability in the food sector. The emergence of a rising number of agents in the Spanish stage could have a profound impact in the supply chain improving transparency and food safety.

As CEO of ICEX, I am particularly proud of the assistance we have been able to provide this year for the internationalization of the Spanish FoodTech sector. We have expanded the instruments and initiatives to support companies and operators, such as the immersion program in the Netherlands, which had a very successful second edition with 8 participating companies. We have built bridges with Japan, introducing our technology centers and startups and getting this country to actively participate in the future next edition of Food 4 Future.

We have also supported our innovative companies taking part in the main exhibition in the USA, EXPOWEST. And finally, we have invested €750,000 in Biotech Food through the INNOVA INVEST program.

We hope that 2023 will bring new opportunities toward the international success of our FoodTech ecosystem. ICEX will continue its endeavor to align all actors involved and make Spain not just a Food Nation but a Foodtech Nation.

¹ You may consult the 2021 edition [here](#).



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01 Introduction

Credits: Origin Algae

Foodtech in Spain:

What is the state of the Spanish Food System?

In the European Union, **Spain is positioned as one of the main agricultural markets**. Spain is the leading exporter of fruit and vegetables, and third in the world, behind China and the U.S. Also, it is the **world's leading producer and exporter of olive oil, with 60% of the EU's production and 45% of the global supply**. In recent years exports have shown a very positive evolution, touching 14.7 million tons in 2021, very close to the historical maximum in 2019, with a value of over **€17,600M²**.

In addition, the productivity of the Spanish agrifood sector (value added per employee) is 29.1% higher than that of the EU-27³.

The importance of this country for the sector has forced it to develop in fundamental areas for food production, which will be developed throughout this report, including:

- **Technologies that ensure food safety** along the food value chain.
- Solutions that allow food to be produced and consumed in a **more sustainable and efficient way**.

- New, healthier, and **more sustainable sources of ingredients**.

The industry is undergoing a decisive transformation towards more sustainable and efficient projects accounting with public support at regional and national level. The different developments in this area have allowed Spain to **remain strong in Foodtech investment** in the face of the most important investment drop that the sector has experienced.

In the past year the **Foodtech space has risen up to €268M, a 9.38% increase since the previous year**. In this increase the alternative protein stands out with an outstanding presence of international investors.

This is the **third edition** of a report that has the main objective of **giving visibility to the Spanish Foodtech ecosystem** and showing its potential to become a Foodtech Nation.

Check the previous report [here](#).

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

More than **50**
specialized **universities**

More than **20**
cutting edge
technological centres

412
Foodtech startups

² Informe sectorial 2022, Caixabank: <https://www.caixabankresearch.com/es/agroalimentario/octubre-2022/agroalimentari-sector-pateix-les-consequencies-guerra-ucraina>

³ Observatorio sobre el sector agroalimentario de las regiones españolas. Informe 2021 <https://publicacionescajamar.es/series-tematicas/informes-coyuntura-monografias/observatorio-sobre-el-sector-agroalimentario-de-las-regiones-espanolas>

Foodtech:

A rapidly growing sector destined to be the future of food

The term **Foodtech** refers to all economic actors that associate innovation with the activities of the food industry, from food production to food consumption. To facilitate the analysis, we have developed our **taxonomy**, organized into four pillars: **agritech**; **food production and transformation**; **logistics and distribution**; and **restaurant tech**.

In each of these segments, there are various sources of innovation and technology, such as biotechnology, robotics, blockchain, artificial intelligence, machine learning, and big data. With these technologies, the Foodtech ecosystem is closer to addressing the sustainability challenges presented by the agrifood 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

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**



02 Spain's Foodtech Ecosystem

Credits: Innomy

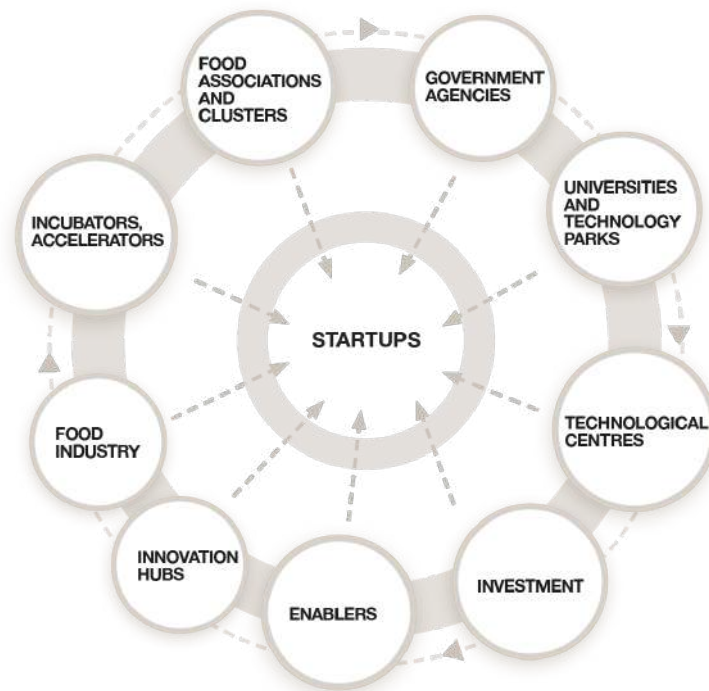
Introduction: What does it include?

The Foodtech ecosystem continues to consolidate in Spain throughout 2022. It is gaining strong ground and has been **building powerful relationships and connections** with every agent in this field.

There is a greater involvement of different agents, either public or private, in **developing initiatives that support new innovative solutions to different challenges**.

Innovation hubs are key agents in this ecosystem and they have developed rapidly this year. They contribute to the ideation of solutions that connect with the market needs.

Throughout this report it will be shown how the activity in this environment has increased and it will be discovered the different initiatives that are being taken to **foster collaboration within an ecosystem**, with the main objective of finding sustainable and healthy solutions in our food system.



Government Agencies: The ecosystem's foundation

At a national level, **PERTE Agro** is expected to generate an impact on the economy of **€3,000M** and a net creation of 16,000 jobs. It is structured in three axes, the first one through the [Ministry of Industry, Trade and Tourism](#) is dedicated to the **agri-food competitiveness, sustainability and traceability** with an endowment of **€510M**⁴, the second is a package aimed to support the **process of digital adaptation of the entire value chain**, endowed with **€454.35M** and which corresponds to the [Ministry of Economic Affairs and Digital Transformation](#) and the [Ministry of Agriculture, Fisheries and Food – MAPA](#) actions to support innovation and research, with a budget of **€148.56M**, which is also the responsibility of the **Ministry of Agriculture Fisheries and Food** together with the [Ministry of Science and Innovation](#).

The **Agroimpulso** initiative, launched by the **Ministry of Agriculture** in collaboration with the [Empresa Nacional de Innovación \(ENISA\)](#), aims to grant loans on favorable terms to agri-food SMEs, and agri-food tech SMEs, that undertake digital technology-based projects.

[CDTI's CERVERA](#) program supports R&D projects carried out in collaboration with a national technology or research center, including among its priority technologies those applied to the construction of a safe and healthy food chain.

Agroalnext R&D Complementary Plan is carried out by **Aragón, Asturias, Extremadura, Murcia, Navarra, Valencia and La Rioja** with the objective to promote the transformation of the agri-food sector towards a greener, more sustainable, healthy and digital scenario, bridging the gap between scientific discoveries, technology development and its implementation.

[ICEX Spain Export and Investments](#), has launched the second edition of **Desafía Foodtech**, an international immersion program in the Netherlands backed by **Next Generation EU funds**, with the objective to support the internalization and fast growth of the Spanish Foodtech ecosystem including startups.

Within the **RIS3 Euskadi Smart Specialization Strategy** and the **Euskadi 2030 Science, Technology and Innovation Plan for Smart Industry**, the **NOWaste** project has been launched. This project aims to increase traceability through IoT, Blockchain and Artificial Intelligence, in order to reduce and valorize the waste generated throughout the food value chain. Companies and organizations from the Basque food chain and the Basque technology and capital goods industry are involved in this project⁵.

⁴ Recovery, Transformation and Resilience Plan (PERTE Agri-Food: <https://portal.mineco.gob.es/en-us/ministerio/areas-prioritarias/Pages/PlanRecuperacion.aspx>)

⁵ 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

The Agri-food Industry: Aligned to create a change

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 €126,354.1M representing 25.4% of the industrial sector, 22.5% of the people employed and 20.6% of the added value.** Furthermore, this industry encompasses 30,260 companies, i.e. 15.7% of the Spanish manufacturing industry⁶. For their part, clusters play a fundamental role in the ecosystem, facilitating the collaboration and mobilization of the different agents.

One example is **The Food Industry Association of Castilla y León, Vitartis**, that is leading the 'Digidat' project, which aims to offer innovative technological solutions for agri-food SMEs in 'IoT' and 'Data analytics'.

The Basque food, environment and mobility and logistics clusters of Euskadi have launching **Foodelivery**, a collaborative project that aims to identify and promote the most sustainable food distribution models in Guipuzcoa.

The **Foodwaste for Foodpack pilot project**, promoted and coordinated by the **Packaging Cluster**, seeks to obtain compostable packaging from organic waste generated by the food industry. Companies from the agri-food and packaging sector are participating in the initiative.

In 2022, **the first association of plant-based products** in the sector, **Vegetales**, was established, bringing together the country's main plant-based beverages brands (**Alpro, Frías, Iparlat, Liquats** and **Vivesoy**).

⁶ Informe Anual de la Industria Alimentaria Española Periodo 2021-2022: https://www.mapa.gob.es/es/alimentacion/temas/industria-agroalimentaria/20220728informeanualindustria2021-20222122ok_tcm30-87450.pdf

Main associations and clusters

AGENCY	LOCATION
Acuipplus Cluster	National
AECOC	National
Asebio	National
Aragonese Food Cluster	Aragon
Bioga	Galicia
Bioplat	Madrid
Biovegen	National
CLUSAGA	Galicia
FIAB	National
FOOD+i Cluster	Navarre
Food For Life	Madrid
Foodservice Cluster	Catalonia
NagriFood Cluster	Navarre
PTV Vino	Madrid
Vegetales	National
Vet+Si	Madrid
VITARTIS	Castile and Leon

Source: prepared by the author

Technological Centres: Keys to combining technological excellence and flavor

Technological centres in Spain are increasingly working on collaborative projects, together with companies and other agents of the ecosystem to develop solutions for a more sustainable and healthier food system.

In this context, the technology centre [CTIC-CITA](#), is coordinating the '**LIKE-A-PRO**' project, funded with around **€14M** and integrated by a consortium that integrates **42 partners** from 14 different European countries, to facilitate the development of alternative protein.

For its part, the [AZTI technology center](#) is coordinating the **ECOFOOD 3S** consortium, which has **€200M from the recovery funds of the Next Generation program** and has a total of **32 agents in the food chain**. It aims to reduce the environmental impact of all the companies in the consortium, promote **greater transparency in traceability and food safety**, and modernize the **digitization** processes of companies and their value chains.

Within the category of new ingredients development, it is worth mentioning the collaboration between **Angel León "the chef of the sea"** and [MAAVi Innovation Center](#), the largest center for biotechnology applied to agriculture in Europe, located in Almería.

Main technology centres with lines of investigation linked to Foodtech

AGENCY

[AINIA](#)

[ANFACO-CECOPESCA](#)

[AZTI](#)

[CARTIF](#)

[CNTA](#)

[CSIC](#)

[CTAEX](#)

[CTNC](#)

[CTIC CITA](#)

[EURECAT](#)

[I+DEA](#)

[IFAPA](#)

[IVIA](#)

[IRTA](#)

[LEITAT](#)

[MAAVi Innovation Center](#)

[NEIKER](#)

LOCATION

Valencian Community

Galicia

Basque Country

Castile and León

Navarra

National

Extremadura

Murcia

La Rioja

Catalonia

Castile and León

Andalusia

Valencian Community

Catalonia

Catalonia

Andalusia

Basque Country

Source: prepared by the author

University and Technology Parks: Applied science for transferring knowledge into startups and industries

The role of universities and technology parks in the development of startups with a strong technological component is fundamental.

Research conducted by universities is generally carried out in science parks that have the technology to scale solutions. The institution in charge of grouping all these parks at a national level is the [Association of Technology Parks \(APTE\)](#).

Even if it is not the most common way of creating startups, there are interesting **examples of startups that have started with the support of top universities** in the country.

An example is the startup [ODS Protein](#), working in the creation of alternative proteins. It was created with the support of the **University of Vigo**, during their incubation program INCUVI.

Another example is the **award-winning startups** [Oscillum](#), who developed a **smart packaging to avoid food waste**, and [Freeshakes](#), working in a **fermentation process to eliminate sugar in food**, started their activity in the Scientific Park from the [University of Miguel Hernández](#) in Elche.

Main technology parks and institutes developing Foodtech in Spain

[Basque Culinary Center](#)

[ESADE Creapolis](#)

[ETSIAM-Universidad de Córdoba](#)

[Fundación Aula Dei](#)

[IMDEA Alimentación](#)

[Instituto Tecnológico de Murcia](#)

[Parc Científic de la Universitat de València](#)

[Parc UPC - Universitat Politècnica de Catalunya - BarcelonaTech](#)

[Parque \(Euskadi Technology Parks\)](#)

[Parque Científico de Alicante](#)

[Parque Científico de Madrid](#)

[Parque Científico Tecnológico de Almería](#)

[Parque Científico Tecnológico de Cartuja](#)

[Parque Científico Universidad Carlos III de Madrid-Leganés Tecnológico \(UC3M\)](#)

[Parque Científico y Tecnológico de la Universidad Politécnica de Madrid](#)

[Parque Científico de la Universidad Miguel Hernández \(PCUMH\) de Elche](#)

[Parque Tecnológico de Galicia-Tecnópole](#)

[UCTAI- Universidad Pública de Navarra](#)

Source: prepared by the author

Industry: Industry and startups join forces

The Spanish food industry is interested in incorporating open innovation programs into its innovation strategies, i.e. collaboration with other agents, especially with startups.

An example of this is [Barlab Ventures](#), the new open innovation platform of the largest beer company in the country, [Mahou San Miguel](#). **Barlab Ventures** aims to be the link between the entrepreneurial ecosystem and this corporate, becoming a permanent channel for the development of disruptive projects for the company's value chain.

[COVAP](#) has launched its open innovation program [GEN_](#) where startups are selected such as [Drops & Bubbles Tecnología SL](#), [Innogando](#), [Cultipty](#), and [Oscillum](#). [CAPSA VIDA](#), [Platos Tradicionales](#), [Embutidos Martínez](#), [Angulas Aguinaga](#), and [Vicky Foods](#) are working along the same lines through the [KM ZERO](#) corporate venturing program developing pilots with startups like [GrinGrin Foods](#), [Mimic Seafood](#), [Quevana](#), [MOA Foodtech](#), and [ODS Protein](#).

Also, it is important to highlight [Ebrofoods'](#) collaboration with the startup [Whatertech](#), looking to eliminate spills from the manufacture of their rice cups. This startup was selected in the second edition of ["Ebro Talent: Caring for Innovation"](#), an open innovation program developed jointly by [Loyola University](#) and [Ebro Foods](#).

An additional way of working with startups is by **acquiring** them. This is the case of [DACSA](#), that already completed its eighth purchase of alternative protein startups this year.

[Vall Companys Group](#), with the supervision of [IRTA](#), have launched a new industry report on the Agri-Food sector, carried out by [The Collider](#), the innovation program of [Mobile World Capital Barcelona](#), and the contributions of thirty experts.

Innovative Food Companies in the Spanish food sector

COMPANY	ACTIVITY
Aidelis	Startups investment
Angulas Aguinaga	Open Innovation Programs
Calidad Pascual	Startups investment
Campofrío	Open Innovation Programs
CAPSA	Startups investment
Coren	In-house research centre
COVAP	Open Innovation Programs
DACSA	Startups investment
Damm	Open Innovation Programs
Ebro Foods	Open Innovation Programs
Familia Torres	Open Innovation Programs
GBFoods	Startups investment
IAN Group	Open Innovation Programs
Incarlopsa	Open Innovation Programs
Iberfruta	Open Innovation Programs
Mahou	Open Innovation Programs
Nueva Pescanova	In-house research centre
Palacios	Open Innovation Programs
Valls Companys	Report
Vicky Foods	Open Innovation Programs

Source: prepared by the author

Incubators and accelerators: Driving the creation and growth of Foodtech startups

In the field of **acceleration and incubation programs**, new calls as well as specialized initiatives, have been launched for existing projects.

On another hand, this year the first Bootcamp to boost alternative proteins was organized in Spain, powered by **Proveg** in collaboration with **Madrid Food Innovation Hub**.

Collaboration between startups and corporations has continued through incubation programs.

This is the case of **Pascual** and **Europastry**, launching the second editions of their incubation programs "**Mykucubator**" and "**Baking the future**" respectively.

In the public sector, **Orizont** launched its sixth call of the acceleration program, while the **Business Food Factory** has concluded its fourth edition.

Within the private sector, **Eatable Adventures** just launched the **Spain Foodtech** program, in collaboration with **ICEX** and **CNTA** to support Spanish Foodtech startups.

Main accelerators and incubators in the Spanish food sector

AGENCY

[Business Food Factory](#)
[Baking the future 2.0 by Europastry](#)
[CajaMar Innova](#)
[Culinary Action!](#)
[Eatable Adventures](#)
[EIT Food](#)
[Fishing Tech](#)
[Global Food Accelerator by Impact Hub+Basque Culinary Centre](#)
[Lanzadera](#)
[Mykucubator 2.0 by Pascual](#)
[Orizont](#)
[Porcinnova](#)
[Spain Foodtech](#)
[The Hop by Estrella Galicia](#)

FOCUS

Agri-foodtech
Agri-foodtech
Water Business
Agri-foodtech
Agri-foodtech
Agri-foodtech
Agri-foodtech
Foodtech
General
Agri-foodtech
Agri-foodtech
Agri-foodtech
Agri-foodtech
Rest Tech

CAPITAL

Public agency
Corporate
Private
Private
Private
Government
Private
Academic institution
Corporate
Corporate
Public agency
Public agency
Private+public
Corporate

Source: prepared by the author

Innovation hubs: Challenging the growth of Foodtech startups

By 2022, the number of agrifoodtech innovation hubs in the nation has dramatically increased, both from private and public sectors.

There are **multinationals in the agriculture sector that opened their own innovation hubs in Madrid**, such as [Syngenta](#) and [John Deere](#). Syngenta seeks to develop digital solutions for farmers, and John Deere is collaborating with the **Polytechnic University of Madrid** to develop high-value crops.

In addition, this year the [Eatex Food Innovation Hub](#) was created. A new collaborative innovation hub for the transfer and implementation of technology in the agrifood industry. This project is promoted by [CNTA](#) (National Center for Food Technology and Safety) with the support of the [Government of Navarre](#) and the **collaboration of more than 10 R&D&I centers of the Navarre R&D&I System (SINAI)**.

In the area of open innovation, the [AZTI](#) technology center and the Basque-French cheese factory [Agour](#), launched [Agour Hazitegia](#), a new space that serves as a startup incubator and promotes innovation in the Foodtech industry in the Basque Country and Iparralde.

Main innovation hubs in the Spanish food sector

AGENCY

[AgroBankTech by INNsomnia](#)

[Agour Hazitegia](#)

[Andalucia Agrotech](#)

[CEIN](#)

[DIHDATALIFE](#)

[EATEX Food Innovation Hub](#)

[Food & Food Tech Innovation Hub by Forward Fooding](#)

[Km Zero Food Innovation Hub](#)

[John Deere Parla Innovation Center](#)

[Ivoro Food Innovation Hub](#)

[Madrid Food Innovation Hub](#)

[Techfarm by Syngenta](#)

FOCUS

Agri-foodtech

Agri-foodtech

Agri-foodtech

Agri-foodtech

Biosources

Agri-foodtech

Agri-foodtech

Agri-foodtech

Agritech

Agri-foodtech

Agri-foodtech

Agritech

CAPITAL

Private

Corporate+Tech centre

Public agency

Public agency

Public agency

Government agencies + businesses

Private

Corporate

Corporate

Private

Public agency

Corporate

Source: prepared by the author

Events:

Networking, showcasing, knowledge

Regarding domestic events, Spain was pleasantly shook by the **second edition of Food4future** becoming an international reference in Foodtech events.

As part of ICEX's collaboration with **Food4Future**, the 14 startups from the two editions of **Desafía Foodtech Program** had the opportunity to attend and engage with investors and corporates showcasing their projects in matchmaking activities, such as **Get in the ring**, where they were exposed to investors and industry leaders in order to drive their business forward.

Rising up in Spain is a program from ICEX-Invest in Spain to attract foreign talent and startups to Spain. It is doing so by **putting together a Spanish corporation with technological needs and challenges with Startups from abroad** able to give a solution to these needs and challenges. By doing so, we support the internationalization process of the Spanish Foodtech ecosystem, among other industries. It is also a very useful tool for the internationalization process of the open innovation programs of Spanish corporations.

The **Alimentaria** event took place this year in April, after a break due to the pandemic. In addition, **the ninth edition of Free From Expo**, Europe's leading innovation platform for the 'free from', organic, vegan, functional food and ingredients industries took place again in Barcelona.

The fourth edition of the Food Design Festival celebrated in July 2022 in Madrid was dedicated to the value of design and its relationship with food.

Main events in the Spanish food sector

EVENTS

[Alibetopías](#)
[Alimentaria Foodtech](#)
[Biospain](#)
[Datagri](#)
[Eit Food Innovation Forum](#)
[F Talks](#)
[Food4Future](#)
[Food Design Festival](#)
[Foodture](#)
[Free From Functional](#)
[Fruit attraction](#)
[Gastroemprendedores](#)
[Hospitality Innovation Platform \(HIP\)](#)
[Meat attraction](#)
[Salón Gourmets](#)
[Smart AgriFood](#)
[Startup Olé](#)
[Trend Builders](#)
[Vegan Cheese Petit Salon](#)

LOCATION

Madrid
Barcelona
Pamplona
Zaragoza
Bilbao
Valencia
Bilbao
Madrid
Barcelona
Barcelona
Madrid
National
Madrid
Madrid
Madrid
Malaga
Salamanca
Barcelona
Madrid

Source: prepared by the author

Enablers:

Media supporting food innovation

It is essential to stay updated with what's happening in the Foodtech industry, as it never ceases to innovate. Fortunately, Spanish media are excelling in their jobs and **providing news sites** that compile all the latest news in one place.

Within this last year, this sector has continued to receive support for its development. [Alimarket](#), for instance, has been expanding their editorial staff to provide latest news to their Foodtech section, aware of the great interest this news awakens in their subscribers.

To go a step further they **launched a new service: Alimarket FoodTech newsletter**, a **weekly newsletter dedicated to Foodtech** with contents exclusively prepared for it, paying attention to any new innovation, investment or project. Furthermore, [Techpress](#) has a **dedicated section to Foodtech** as well, highlighting the latest news in the sector.

In the [Foods & Wines from Spain \(FWS\)](#) webpage, on a weekly and monthly basis, **Foodtech news as well as articles** are published, being a source of detailed information about the latest trends and news of the Foodtech ecosystem.

[TechFood Mag](#) is another well known and prestigious Spanish Foodtech website, providing companies, startups, investors and organizations in the food industry with **up-to-date information and analysis on innovation and food tech**. **Beatriz Romanos**, founder of the magazine has published in 2022 a book dedicated to Foodtech, titled ["Foodtech: La gran revolución de la industria agroalimentaria"](#).

Main media in the Spanish food sector

MEDIA

[Alimarket](#)

[Foods & Wine from Spain](#)

[TechFood Mag](#)

[Techpress](#)

[Tecnoalimen](#)

[Vegconomist](#)

TYPE

Online / Magazine

Online

Online

Online

Online

Online

Source: prepared by the author



03 Spain's Foodtech Startups

Credits: Mimic Foods

Startups: Delivering innovation to the market

Foodtech startups play an important role in transforming, enhancing, and developing the food system of the future.

To remain competitive and pertinent in the ecosystem, it is essential to have high technological capacity and strength, which leads to patents, trade secrets, and trademarks. According to [Eatable Adventures'](#) study, **32.9% of 412 Spanish startups have a patent for their technology** and, **29% have a trade secret**⁷.

During 2022, the percentage of startups that have developed their technology internally has increased even more. In this area, there is a dramatic growth in the use of technologies, mainly startups using **artificial intelligence (AI)**, that went from 28.21 to 40.79%, earning 12 points compared to the previous year.

AI tends to increase efficiency in different aspects, including product design, or automation. Meanwhile, IoT, blockchain, robotics, and machine learning grew accordingly.

412
STARTUPS

32.9%
HAVE
PATENTS

29%
TRADE
SECRET

Deep Techs employed in 2022

TECHNOLOGY	PERCENTAGE	VARIATION
Biotechnology	30.26	▼
AI	40.79	▲
Machine learning	32.89	▲
IOT	25	▲
Robotics	14.47	▲
Blockchain	6.58	▲

Source: Eatable Adventures, 2022

⁷The State of Foodtech in Spain (2022). Eatable Adventures: <https://www.eatableadventures.com/report-eng-2022/>

Startups: Delivering innovation to the market

In 2022 the Spanish Foodtech projects have reached similar percentages as others in the agrifoodtech value chain. For instance, **food production and transformation maintained its lead accounting with 34% of the total of Foodtech startups** this year. Food production and transformation maintained its lead accounting with 34% of the total of Foodtech startups this year⁸.

According to the ranking of the main startup global areas, **product innovation accounts for 25% of the overall Foodtech startup market**. A total of **21% of startups are focused on direct-to-consumer business models**, including online sales, meal kits, and vending, and **12% are concentrated in the digitalization field**, in the creation of software, robotics and marketplace.

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



⁸ The State of Foodtech in Spain (2022). Eatable Adventures: <https://www.eatableadventures.com/report-eng-2022/>

Top 3: Ranking by global areas

21% **DIRECT-TO CONSUMER MODELS**
Online sales, meal kits, digital native brands, new generation vending, etc.

15% **PRODUCT INNOVATION**
Including products and alternative origin ingredient sources

14% **FIELD DIGITALIZATION**
Including software and hardware and robotics and marketplaces.

Source: Eatable Adventures, 2022

03 Spain's Foodtech Startups

Startups: Delivering innovation to the market

In order to analyze the Foodtech landscape in Spain, we have taken into account **all the startups which incorporates innovation along the entire food value chain.**

In the area of **agritech**, startups involved in the **automatization of field have increased since last year, from 36% in 2021 to 38% in 2022.** The number of agritech startups working on **new cultivation systems has increased from 18% in 2021 to 22% this year.**

In the area of **Production and Transformation**, new products involve more than the half of this area due mainly to alternative proteins, followed by **new sources of ingredients with 21.8% of startups in this area.**

This year the **Logistics, Distribution and Retail** sector gained importance due its analytics solutions for retail, with 8.8% of startups working in this area. New sales channels continues to be the most important area of activity, with 75% of startups working in the area.

In the **Restaurant Tech** space, management platforms continue to be the most important area, especially this year with **CoverManager** showcasing the biggest investment.

In the following page, Spanish Foodtech startups, grouping them by degree of investment and innovation, and classifying them according to our own taxonomy.

(Taxonomy description available on page 6).



Credits: MOA foodtech



Credits: Néboda



Credits: letitiv foods

Startups: Championing innovation throughout the value chain

Agritech



Food production and transformation



Logistics, distribution and retail



Restaurant Tech



New entries





04 Invest in Foodtech in Spain

Credits: Heura Foods

04 Invest in Foodtech in Spain

Foodtech: A sector under pressure

Global investment in Foodtech has decreased compared to the large growth experienced in 2021. In 2022, **global investment in Foodtech startups and scaleups raised \$27B globally, a 44% decrease versus 2021⁹**. This significant drop is a consequence of the challenges imposed by the Covid-19 crisis which triggered one of the deepest recessions in history, as well as the Ukraine conflict, which is adding inflationary pressures by disrupting the economical environment, especially in Europe. In 2022, the drop was led by the food and grocery delivery industry due to lockdowns, rising costs, and slowing revenue growth. **Food and grocery delivery startups raised 31% of the capital in 2022**, compared to 45% in 2021, which led to a **reduction of 57% in venture capital investments**. Nevertheless, at an international level, **Europe still ranks third in 2022 VC investments**, behind North America with **\$12B**, Asia with **\$8.4B**, and **Europe with \$6.3B⁹**.

On an international level, if we break down the investment by quartiles, it can be seen that the global VC investment in Foodtech in **Q1** reached **\$9.2B.**, **down by 16%** from Q1 2021¹⁰. Foodtech VC investments cooled in **Q2 2022** due to the economical reasons mentioned before, reaching **\$5.7B.**, representing a **decrease of 43%** in comparison with Q2 2021. In Q2, the share of mega-rounds (**\$100M+**) has decreased, while the share of early-stage rounds (**\$4-15M**) increased. Enterprise software Foodtech startups raised the most capital, overtaking capital-intensive delivery startups¹¹. Later, Foodtech startup funding has continued to slow down in **Q3 2022**, reaching **\$4.7B.**, showing a **decline of 65%** from Q3 2021. In this quarter the share of Early-stage rounds (**<\$15M**) increased to 23% of total, while the share of rounds above **\$100M** decreased to **34%**¹².

Although investment has decreased in 2022 compared to the previous year, the sector remains very attractive for investors and entrepreneurs. In spite of today's challenging environment, this flourishing ecosystem has been able to attract international investors and see the growth of investment rounds. In the international Foodtech ecosystem, it's noteworthy to emphasize that **Spanish Foodtech startups have raised a total of €268M in 2022**¹³.

⁹ Dealroom Database: www.dealroom.com

¹⁰ Foodtech startups and venture capital Q1 2022, Five Seasons Ventures, April 2022: <https://dealroom.co/uploaded/2022/04/Dealroom-foodtech-report-Q1-2022.pdf?x72253>

¹¹ Foodtech startups and venture capital Q2 2022, Five Seasons Ventures, July 2022: <https://dealroom.co/uploaded/2022/07/Foodtech-Q2-2022-report-1.pdf?x39545>

¹² Foodtech startups and venture capital Q3 2022, Five Seasons Ventures, October 2022: <https://dealroom.co/uploaded/2022/10/Foodtech-Q3-2022-Report.pdf?x71439>

¹³ The State of Foodtech in Spain 2022, Eatable Adventures: <https://eatableadventures.com/report-eng-2022/>



Credits: Deal Room

04 Invest in Foodtech in Spain

Invest in Foodtech in Spain

In 2022, the majority of startup investments have remained in **the seed stage, factoring at about 43.5%**, almost reaching half of the total within this category. While the number of **startups in Series A continues to grow, reaching almost 30%**.

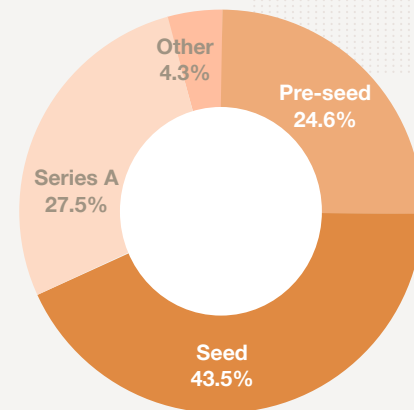
2022 registered a **total investment of €268M**, experiencing **growth of 9.38% compared to 2021 (excluding the Glovo effect)**.

From 2021, the total amount of **startups funding at Series A gradually increased, going from 23% to 27.5%**.

In terms of numbers, 2022's rounds that were sized €500,000 and up, all went through a rough growth, while **smaller investment rounds varying from 0 to €500,000 dropped in percentage**¹⁴.

The smaller investment rounds were led mainly by public organizations, government accelerators or business angels.

The increase in rounds goes hand in hand with the **entry of international venture capital investment in the Spanish Foodtech scene**.



ROUND SIZE

From €1 to €350,000

2022

52.78 %

2021

65.71 %

From €350,001 to €500,000

13.89%

14.29%

From €500,001 to €750,000

11.11%

5.71%

From €750,001 to €1,000,000

2.78%

2.86%

More than €1,000,000

19.44%

11.43%

Source: Eatable Adventures, 2022

¹⁴ The State of Foodtech in Spain (2022). Eatable Adventures: <https://www.eatableadventures.com/report-eng-2022/>

04 Invest in Foodtech in Spain

Invest in Foodtech in Spain

The biggest round in 2022 was raised by **CoverManager**, a restaurant management software platform, **raising €52M**. Before this transaction, the firm **had already reached a valuation of €140M**. Some examples of successful entrepreneurs in the Spanish ecosystem who entered the company's capital: **Félix Ruiz (Tuenti, Auro and Playtomic)**, **Paco Ávila (founder of the training company MEDAC)**, **Javier Gutiérrez (CEO of the Dani García Group)** and **Fernando Martínez (founder of Alia Capital)**.

This year's second biggest investment was **Flax & Kale** with a round of **€22M** for international expansion led by **Javier Rubió** and **Dídac Lee** through **Barlon Capital**, followed by **Heura Foods**, with a total investment of **€20M**, raising **€4M in just 12 hours through its crowdfunding, Equity for Good Rebels** via **Crowdcube**. The remaining **€16M**, in the form of convertible notes, led to what's anticipated to be **one of 2023's largest Series B rounds in Europe within the alternative proteins industry**¹⁵.

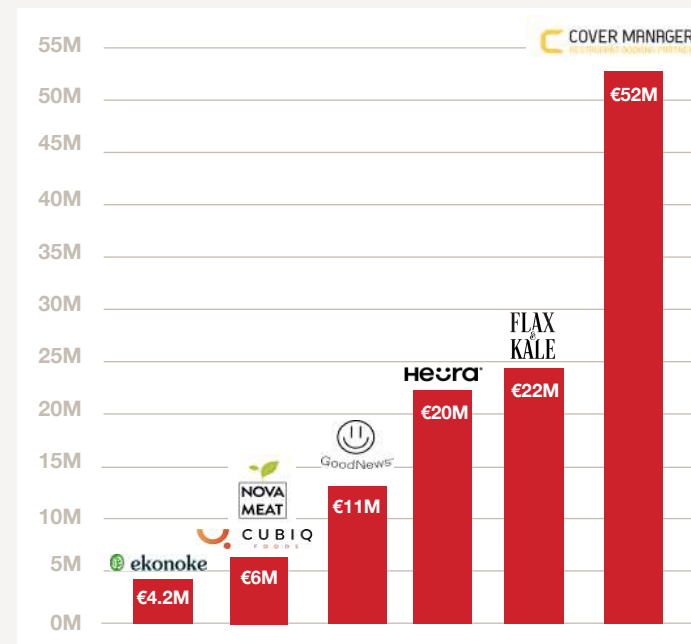
In the 4th investment ranking position stands the Barcelona-based startup **GoodNews**, which raised **€11M** to scale its socio-cultural coffee movement, led by **Thomas Meyer**, founder of **Desigual**, through his company **"La Vida es Chula"**, and **Barlon Capital**.

Both **Novameat** and **Cubiq Foods** secured a **\$6M** round to **escalate their products to the next level**. These rounds were led by the private equity and venture capital firm **Praesidium**, and **Cargill**, respectively.

Lastly **Ekonoke** closed a **€4.2M** investment round, led by the agricultural innovation "powerhouse" of **Corporación Hijos de Rivera, Cosecha de Galicia**.

¹⁵ The State of Foodtech in Spain (2022). Eatable Adventures: <https://www.eatableadventures.com/report-eng-2022/>

2022 Ranking round size



Source: prepared by the author

04 Invest in Foodtech in Spain

Invest in Foodtech in Spain

When it comes to Spanish investors, business angels play an important role in the investment rounds at a national level. Two of the major investments were received by [Cover Manager](#) and [Heura Foods](#).

A major investor in the Foodtech field at a national level is [Clave Capital](#), which within the last year **has invested in a total of 7 Spanish startups** through its platform [Tech Transfer Agrifood](#). It was **the first venture capital fund launched in Spain specialized in agrifood**, aimed at solving this sector specific demands¹⁶. In 2022 new vertical funds have been announced, like **the first one dedicated to agrifood based in the Basque Country**, managed by [Cardumen Capital](#), together with the [Basque Culinary Center](#).

With 3 investments in Spanish startups, the collaborative investment platform [Dozen investments](#) ranks second in the list of private investors.

And finally, [Eatable Adventures](#), the Spanish accelerator specialized in Foodtech which takes third place in the ranking of major Foodtech investors, investing in startups focused on alternative proteins, such as [Innomy](#) and [Cocuus](#).

Main domestic investors by number of investments

INVESTOR	LOCATION	STARTUPS
	Valencia	     
	Barcelona	  
	Madrid	 
	Madrid	
	Madrid	

Source: prepared by the author

¹⁶ The State of Foodtech in Spain (2022). Eatable Adventures: <https://www.eatableadventures.com/report-eng-2022/>

04 Invest in Foodtech in Spain

Invest in Foodtech in Spain

Since 2021's investment of [JBS Foods](#) in [Biotech Foods](#) it was clear that more and **more international players would be looking at the Spanish ecosystem** for the most disruptive technologies in the food industry.













International accelerators, corporates and investors have been backing Spanish startups across 2022.

[Rockstart](#) and [Big Idea Ventures](#) have welcomed in their 2022 cohorts [Innomy](#), [Vacka](#) and [Pink Albatross](#), betting on **different verticals of the alternative protein segment**, from mycelium burgers to vegan cheese and ice creams.

The Navarre startup [Cocuus](#) has caught the attention of [Big Idea Ventures](#) and [Cargill](#), one of the **largest meat manufacturers worldwide**, who also has invested in [Cubiq Foods](#), a platform for the development of cultivated fats.

[Heura Foods](#) and [Novameat](#), both work on plant based meat analogues, share the same VC. [Unovis](#) has supported both companies from the early stage funding.

Main international investors by number of investments

INVESTOR	LOCATION	STARTUPS
	Netherlands	 
	USA	 
	USA	 
	USA	 

Source: prepared by the author

A woman with her hair in a bun, wearing a white lab coat, is seen from behind, holding a green crate. She is standing in a vertical farm with rows of black pipes containing green plants. The background shows more rows of plants and the interior of the facility.

05 Spain, Foodtech Nation

Credits: Groots

05 Spain Foodtech Nation

The Spanish Foodtech ecosystem is increasingly recognized worldwide. All the projects emerging and undertaking, positions **Spain as one of the leading countries in Foodtech.**

Research and development in the food industry never ceases to impress us, playing in favor of innovations to create a more sustainable future.

In this section, we will analyze some of the main actions that took place over the last year in the following areas.

- **New ways of creating alternative proteins**
- **Building Infrastructure to Provide Animal-Free Proteins.**
- **Developing functional ingredients.**
- **Enhancing the efficiency of the agrifood industry.**
- **Sustainability and Foodtech join forces to provide solutions (SDG).**
- **A new approach to foodservice.**



Credits: Isauki



Credits: Väckä



Credits: Pink Albatross

New ways of creating alternative proteins

To succeed with consumers at scale, alternative protein products must meet the following core needs: taste, price, convenience, sustainability, and health. **The best ally for achieving these as a whole is technology.**

During the last few years, technology has played a big role in food innovation, allowing **new food products to thrive in today's demanding market**, as it was experienced with the **alternative protein sector**. Foodtech startups in the alternative meat area are helping speed up the process, improving taste and texture, while creating and **investigating new ways of sourcing ingredients through technology**. In addition to meat alternatives, the spotlight has been directed to other categories as the alternative protein sector has grown, such as the **seafood alternative sector**.

Over the last two decades, seafood consumption has increased by 122%¹⁷, and the number is expected to continue to rise.



Mimic Seafood, a Madrid-based startup is developing a completely natural plant-based product that resembles seafood.

Credits: Mimic Seafood

¹⁷ FAO. 2022. *The State of World Fisheries and Aquaculture 2022. Towards Blue Transformation*. Rome, FAO.

Overfishing, harmful catching practices, pollution, and habitat destruction are threatening the future supply of seafood. As **people become more conscious** of the impact it has on the planet, innovation in the alternative seafood sector is much needed, and Spanish players are already part of it.

[Seavolution](#), a Madrid-based startup **develops a unique alternative protein technology that produces sustainable and healthy, plant-based products**, with the identical texture, good flavor, and color of the real fish and seafood experience.

Also, [ISAUKI](#) a Bilbao-based alternative seafood brand is **developing seafood analogs using algae and seaweed through fermentation and texturization**, targeting the current life-threatening issues of fish stock depletion, ocean pollution by fishing vessels, and the high carbon footprint associated with its production and transportation.

[Mimic Seafood](#), part of the **Desafía Foodtech Program**, develops a completely natural plant-based product that resembles seafood. During 2022 the startup has been awarded multiple times, as **Gastro & Foodtech Startup of the Year** by the [Basque Culinary Center](#), as the **Most Gender Equal Startup** during the [Smart AgriFood Summit](#) in Malaga. They also won the 1st place in the Bilbao Edition of the startup contest [Get in the Ring](#) during **Food4Future**.

New ways of creating alternative proteins

Spanish startups join the wave of collective consciousness by debuting market aisles making **dairy food more healthy and sustainable**.

A Spanish plant-based cheese company, **Quevana**, which has been part of the first **Desafia Foodtech Program**, produces their products using an **innovative process** that involves creating a paste of cashew nuts, fermenting it, molding it into a cheese shape and letting it **cure for several months until it has a semi-cured texture**. The company success led them to launch its products internationally, **available in 150+ Jumbo supermarkets all over the Netherlands**, and in other specialized **stores in countries such as Qatar and Bahrain**.

Väcka, a Barcelona-based vegan cheese company, **offers six varieties of fermented cheese**, without artificial flavorings, gluten-free, and with an organic seal, in Spanish retails and foodservice.



Quevana develops semi-cured cheeses based on cashews, which are available internationally.

Credits: Quevana

Furthermore, **Mommus**, an Alicante-based plant-based cheese company is **producing a plant-based camembert made from cashew nuts**.

To speed up the company's expansion, **Dacsa Group enters with capital to expand its production capacity and provide support** to reach the country's main distribution chains. With this new agreement, **Mommus will co-create with Dacsa alternatives to dairy products**, in addition to providing support in the marketing of the current Mommus range.



Mommus and Dacsa Group join forces to expand its productions capacity and provide support for distribution.

Credits: Mommus

The **egg alternatives space** has a big spectrum of opportunities to succeed, from bakery and confectionery, mayonnaise and sauces, and direct egg replacements, to frying, scrambling, or creating a vegan Spanish tortilla.

As an example, the **Spanish brand Ouvo, the first Plant-Based Liquid Egg in Spain**, is planning to launch in Q2 2023 in Horeca, and Q3 2023 in retail.

Regarding plant-based sweets, **Pink Albatross offers healthy vegan ice creams having a unique creaminess** with a mixture of coconut milk and cashew nuts.

Building Infrastructure to Provide Animal-Free Proteins

The need to scale alternative proteins is inextricably linked to the growth of alternative meats and proteins themselves. As concerns such as sustainability and health issues grow, consumers' demand for alternative protein and sustainable products is surpassing what the industry can provide. Therefore, companies are **setting up their own infrastructure to prevent high prices and limited availability of alternative proteins for consumers.**

Producing alternative proteins, whether plant-based, cell-based, or fermented, involves many moving parts that need to come together for them to scale effectively.

In 2022, **Cocuu**, a technology company from Navarre **specializing in the food biosynthesis of alternative proteins**, both plant-based and from cultured cells, **has presented the world's first industrial 3D food printing line** in its new research laboratory, a new 4,000 square meters facility in Landaben, Navarra.



Cocuu has presented the world's first industrial 3D food printing line in its new research laboratory, a new 4,000 square meters facility in Landaben, Navarra.

Credits: Navarra Capital



ICEX provided a grant of €753,000 to Biotech Foods project entitled 'InvestMEAT', which is focused on research into cell lines, culture media, and biomaterials.

Credits: Techpress

Governments also take place to invest in infrastructure building. ICEX supported **Biotech Foods**, which manufactures cultured protein-based meat. Through its 'Innova Invest' line of funding for R&D, **ICEX has supported 9 projects from different industries and technologies** (renewable energy, software, electronics, bio & health, and so on). In this case, **ICEX provided a subsidy of €753,000** for this research, aiming to keep production costs within suitable ranges so that cultured meat reaches the end consumer and is competitive in price with the current supply of protein.

In the same matter, the company recently announced that it will invest **€6.7M** in building its new headquarters, an 11,100 square meters plot of land, in the **Eskusaitzeta industrial park** in Donostia, where it plans to relocate within two years. The program **supports R&D investments in Spain by companies with foreign capital participation** that are already established or planning to establish themselves in Spain.

Building Infrastructure to Provide Animal-Free Proteins

Producing alternative proteins still requires raw materials, technical employees, well-equipped facilities, and an established supply chain to get resources and products in line with the consumer's demand.

The food industry is now experimenting with an **increasing number of companies developing the building blocks of this infrastructure**, providing the means and the methods, from bioreactors to factory blueprints to new growth factors to create new raw materials in the supply chain.

In this regard, Spain sums important **bioreactor companies** to the cause. **BIONET**, located in Murcia, Spain, **is a leading manufacturer of laboratory, pilot and industrial equipment and software for the bioprocessing industry**, as well as a provider of **advanced bioprocess-related services** for companies that want to produce biomolecules through microbial fermentation or through cell culturing processes.



Known for its laboratory, pilot and industrial equipment and software, the Spanish company Bionet manufactures advanced bioprocess-related services.

Credits: Bionet



Tecnic Laboratories have been part of MELISSA Project, a model conceived to study and develop a biological life support system.

Credits: Tecnic EU

Tecnic Laboratories in Girona **provides microbiology and cell culture equipment for continuous product improvement**, acting as a link between the R&D+i and manufacturing departments, providing scalable solutions to accelerate the industrialization process.

Their **own developed software eSCADA monitors and controls the bioprocesses**, providing all the needed information in terms of Process Analytical Technology in a R&D environment or under **GMP regulation**.

For instance, they've been part of **MELISSA project**, hand-in-hand with the **European Space Agency** and **Universitat Autònoma de Barcelona**, developing a **model system conceived as a tool to study and develop a biological life support system**, aiming at complete recycling by taking advantage of the combined activity of different types of organisms and inspired by an aquatic ecosystem.

Developing functional ingredients

Entrepreneurs and large industries are in the need of innovating and producing certain functional foods that have specific health attributes through new technologies. With new innovations and alliances in the national ecosystem, **Spanish startups are filling the market's whitespace by developing functional foods and ingredients.**

Nucaps Nanotechnology, the Navarre-based company **specializing in the micro-encapsulation of bioactive ingredients**, which participated in the second edition of the **Desafia Foodtech Program**, has surprised the food industry with new developments that seeks to respond to one of today's most widespread nutritional challenges, salt reduction, with its new product '**NuCla**'. Also, **Nucaps** partners with **El Caserío** to develop **the first nanotech candy on the market.**

In a strategic alliance with **Cargill, Cubiq Foods** will **develop fat solutions with Omega-3 fats of vegetable origin** from microcapsules with their new product '**Go! Mega 3**'.



Nucaps partners with el Caserío to develop the first nanotechnology candy on the market through the "Healthy-Nano Sweet" project.

Credits: Nucaps



Ingredalia have been able to extract the molecules responsible for the healthy effects of broccoli to create a immunostimulant ingredient.

Credits: Ingredalia

Ingredalia, an innovative technology-based company based in Milagro (Navarre), which has been part of **Desafia Foodtech Program** as well, is **developing natural functional ingredients from vegetable by-products** from agri-food companies.

Through their innovative technology, they have been able to **extract the molecule responsible for the healthy effects of broccoli** (sulfuraphane and glucosinolate) and **incorporate it into their products**, creating an immunostimulant ingredient with multiple health benefits.

As part of the food innovation ecosystem, **Ingredalia** is also participating in **Proyecto CRESCERE**, a project funded by **CDTI**, seeking to increase the added value of plants with high nutritional and chemopreventive value through the development of new uses and applications.

Enhancing the efficiency of the agrifood industry

Agritech is the use of technology and technological innovation to improve the efficiency and yield of agricultural processes. **Digitization of the agrifood ecosystem** opens doors to new innovations in this area.

In Seville, [ec2ce](#) is applying **artificial intelligence into smart agriculture**, producing predictive tools for pest/disease control and productivity forecast in decision farming systems.

This kind of innovation is based on **the inclusion of artificial intelligence** into an actionable tool to make pest control decisions oriented toward maximizing economic returns to grow and improve crop sustainability. The company accounts with **three predictive platforms: Olivia, Berria, and Solania**, targeting olives, berries, and industrial tomato respectively, with the objective of delivering accurate and anticipated information about farms and supply chain to production and commercial managers helping them take better decisions.



ec2ce applies artificial intelligence into smart agriculture, producing predictive tools for pest/disease control and productivity forecast in decision farming systems, targeting olives, berries, and industrial tomato.

Credits: ec2ce



Terrace Lab, a Madrid-based company providing an end-to-end service giving access to freshly grown veggies harvested right in the customers eyes.

Credits: Terrace Lab

In terms of sustainability, Spanish companies are **working towards vertical farming in different forms**. Vertical farming is one answer to providing high-quality produce sustainably.

[Terrace Lab](#) is a Madrid-based company with the vision of **improving people's quality of life by providing Farming as a Service (FaaS)**. Through their IoT vertical farming displays, the company provides an end-to-end service giving access to freshly grown veggies harvested right in the customers eyes, without the need of pesticides, providing a value-added solution to their B2B clients.

Similarly, [Neboda](#) a Galician-based company is applying the concepts of **indoor vertical farming, to harvest vegetables of the highest quality**, relying on solutions such as hydroponics, climate control, and LED lighting.

Enhancing the efficiency of the agrifood industry

Ekonoke, the Spanish startup dedicated to **growing hops indoors to support sustainable beer production**, closed one of the main financing operations of the year in the national Foodtech ecosystem, accelerating its indoor hops cultivation project with the **upcoming launch of a 1,000 square meters pilot plant** in the facilities of **Estrella Galicia**.

The very first batch of hops harvested at the beginning of 2022 in the industrial plant of Ekonoke in San Sebastián de Los Reyes is **commercialized through Estrella Galicia restaurant La Tita Rivera in central Madrid**.

The project in collaboration with **Cosecha de Galicia**, is expected to **scale commercially with a 10,000 square meters facility in 2024**.



Ekonoke, is accelerating its indoor hops cultivation together with Spanish beer producer Estrella Galicia, aiming to scale the production in 2024.

Credits: Ekonoke



From 2022, the company's growth accelerates with the opening of the second farm in Barcelona. In 2023 they will be launching the first farm in Madrid, responding to the demand of current customers.

Credits: Groots

Additionally **Groots**, a Barcelona-based company has **developed a growing technology based on a hybrid solution** of growth in racks and modular towers in order to optimize the use of space and maximize the quality of the plants. The Groots system uses **hydroponics with savings of more than 90% of water** compared to traditional agriculture.

The company's factory in Catalonia covers **2,500 square meters** and has proprietary cultivation systems, a biomimicry strategy, a product-to-process approach, adapting to new technologies and total control over the design, manufacturing, and assembly processes.

Compared to traditional agriculture, this type of controlled agriculture has **40 times more productivity**, since the roots don't need to grow downwards to get water, but are provided with it directly.

Sustainability and Foodtech join forces to provide solutions (SDG)

Advances in the agri-food sector make the Foodtech ecosystem the ally for a **progressive regeneration of the system**, where trends such as alternative proteins, biotechnology, vertical agriculture, new cultivation systems, fermentation, and upcycling continue to stand out.

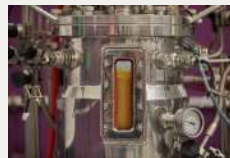
Among the **UN's Sustainable Development Goals (SDG)** are measures to reduce greenhouse gases, energy used in production processes, and food waste, in addition to ensuring healthier diets. Startups in the Foodtech sector are driven by these goals to apply new technologies and transform the industry using more sustainable, efficient, and modern tools.

One of the challenges of the **SDG 2030 goals** is the **transition from a linear to a circular economy**. One of the startups to highlight is **Byproductplace**, a digital platform for the **commercial exchange of by-products and waste** that gathers companies, industries, institutions, and technology centers with a common goal: promoting circular economy and moving towards a more sustainable world.



Byproductplace is a commercial exchange platform for suppliers who want to revalue by-products and waste, generating a win to win relation for the production chain.

Credits: Byproductplace



Cultipliy is a biotech company specialising in the development of fermentation processes in the food, agricultural, biopharmaceutical and cosmetics industries.

Credits: Cultipliy

The Seville-based biotech startup **Cultipliy** is developing its first own protein ingredient based on the revaluation of industrial sub-products. Cultipliy aims to be the clients strategic partner for microorganism production projects or their derivatives, from the idea phase to the industrial stage.

The company has developed numerous **microbial production processes** with biofertilising, biostimulant or biopesticide activity well suited for sustainable agricultural applications. Regarding ingredients, they develop **High Cell Density Cultures (HCDC)** to produce both microbial biomass and ingredients of biological origin using cost-effective raw materials.

Among all their techniques, **they use fermentation as a tool to revalue by-products** of the agricultural, food, pharmaceutical and biotechnology industries, using them as cost-effective carbon or nitrogen sources. This allows them to manufacture bioproducts from cheap raw materials in a sustainable and cost-effective way.

Sustainability and Foodtech join forces to provide solutions (SDG)

The startup **Algaloop** uses breakthrough science and technology to enhance food safety, working in collaboration with the **Universidad Politécnica de Valencia** to produce microalgae-based biofertilizers, biomaterials, cosmetics, and food extracts. In the food sector, their main objective is to **eliminate dependence on wild-caught fish as a source of Omega-3 by harnessing the potential of microalgae**, offering a range of food products, such as an isotonic drink with spirulina and cyclocyanin, spirulina snacks, energy bars, spirulina chocolate, among others.



Algaloop applies leading advances in science and technology to improve food security using algae, they offer food products with added value.

Credits: Algaloop

Plastics are one of the most widely used materials in the food industry, but the lack of solutions on the market continue to position them at the forefront. Several startups are attempting this challenge by offering new solutions.

Through biotechnology, **VENvirotech** produces **biodegradable bioplastics** **denominated Polyhydroxyalkanoates (PHA)**, which are produced by bacteria, thanks to a proprietary technology that is installed where the waste is generated, allowing the PHA bioplastic to be obtained in a 24-hour process.



VENvirotech produces bioplastics, biodegradable in the environment and compatible with the human body, using bacteria for producing their bioplastics.

Credits: Venvirotech

Sustainability concerns are also leading **pet food producers** to look for novel ingredients that have fewer associated environmental impacts.

The Madrid company **Ginqo**, **created natural dog food made from insect flour**, which not only offers great nutritional benefits, but its production model aims to reduce the carbon footprint and enhance the circular economy.



Ginqo produces pet food with insect protein, hypoallergenic and grain and gluten free, with a local production and with almost no water consumption.

Credits: Ginqo

A new approach to foodservice

Technology offers a **myriad of possibilities and solutions for restaurants** to add value to their brand by streamlining management with efficiency, in addition to the creation of new differential gastronomic experiences.

For instance **Haddock**, a Spanish startup that consists in **an easy-to-use app that facilitates the administrative management of restaurants**. By offering a digital solution for establishments to upload their income and expenses to the cloud, they know how the business performance is going in real-time. The solution focuses on **intelligent cost control for restaurants and bars**.



Haddock, a Spanish startup that uses an easy-to-use app to facilitate the administrative management of restaurants. By offering a digital solution for establishments to upload their income and expenses to the cloud, they know how the business performance is going in real-time.

Credits: Haddock



CoverManager is a Spanish startup which offers a digital platform that support restaurants in the global management of their sales by building customer loyalty, without relying on one sales channel.

Credits: Covermanager

The number of startups working in **reservation management** has grown in 2022, highlighting the leading Seville-based startup **CoverManager**.

The company provides a variety of solutions to their clients, from orders and payments at the table, virtual assistant, booking, orders and queue management, as well as channel management.

CoverManager is digitizing the reservation management of more than 6,000 restaurants, outlets F&B in hotels, beach clubs and pubs, accounting with more than 100 Michelin restaurants. The Spanish company has been the leading startup in terms of investment this year, raising €52M.

A new approach to foodservice

Furthermore, **Delectatech** a Barcelona-based startup is **focused on AI-First SaaS applications research** and development based on Artificial Intelligence and Data Mining for the FoodService sector. Its main product, **Food Radar**, offers the largest observatory of information on the hospitality sector in the form of SaaS, providing a **wide range of KPIs on more than 250.000 premises monthly updated**.

With the inclusion of artificial intelligence (AI) in restaurant processes, restaurant owners and managers can reduce food waste, reduce costs, and run their businesses more efficiently and sustainably.

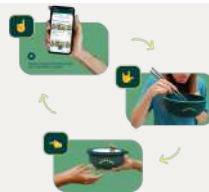


Delectatech main product, Food Radar offers the largest observatory of information on the hospitality sector in the form of SaaS, providing a wide range of KPIs, making the most exclusive and updated information available to all the players in the sector in just a few clicks.

Credits: Delectatech

Bümerang Takeaway has created reusable packaging solutions for the takeaway industry, offering free and **waste-free solutions** to enjoy our food without generating packaging materials.

Together with **Areas Iberia**, **Bümerang** has implemented the so called '**Road To Reuse**' project, supported through Next Generation funds.



Bümerang eliminates single-use plastic from take-out food and beverage through innovation in reuse systems.

Credits: Bümerang

The pilot of a **Deposit, Return and Return system** has been established in the main catering spots in the Barcelona and Madrid train stations.

Another startup on the radar is **Ghop**, the **first grab and go-supermarket in Spain**, has already launched **two smart stores in Madrid**. This commercial space is unique since it does not have any staff and is based on automatic recognition of products at checkout. It is a small establishment (15 square meters) open 24 hours a day that offers face-to-face and immediate sales.

The technology used automates and centralizes all store operations and resources, including **user check-in, product recognition at the checkout, remote assistance**, mobile payment and door opening after verification, as well as video surveillance and automatic management of stock in real time.



Credits: Oscillum

06 Technologies ensuring Food Safety along the value chain

Importance of Technology in Food Safety: Introduction

Based on the **National Institute of Statistics (INE)** data, the food industry is **Spain's leading manufacturing industry** with a turnover of more than **€126,354M**, comprising **25.4% of the manufacturing sector** and **2.5% of the national economy**¹⁸.

It is therefore crucial that **food traceability and food safety are maintained throughout the food chain** in order for this industry to continue growing and flourishing without any complications, such as epidemics or diseases.

As a means of ensuring food safety and preventing food-borne illnesses or injuries, specific standards are followed during the preparation, handling, and storage of food.

The world is rapidly becoming more digital. Advances in artificial intelligence, the Internet of Things, sensor technologies, and blockchain are improving business processes. New digital technologies offer the potential to help us predict and prevent food safety problems and better detect and respond to problems when they do occur.

In this section, we will explore **Spain's potential in the development of traceability and food safety** along the food chain with a compilation of the various agents working in this area.

When it comes to supply chain management in terms of food safety, traceability is one of the most important insights and leading indicators required to **anticipate and prevent any upcoming food-borne illness risks, food waste, food integrity or food certificate issues**.

Consumers are now more conscious about where their products are produced, **demanding transparency, visibility, and traceability**, in a clear format, throughout the supply chain, from source to retail.

In this matter, **blockchain enables companies to ensure trust behind each label**, in a B2B level, the main advantage for the blockchain platform members is the ability to guarantee that the data they are providing to their customers, suppliers or authorities is true, as is a decentralized system where data cannot be altered or erased.

Also, within a **blockchain platform**, the **time to trace a product** (being a few minutes compared with hours or days in traditional systems) **makes the difference between a large-scale product recall or a minor incident** that can be resolved before it leaves the production facility. In this matter, the value of blockchain technology for **food supply chain management** is mainly focused on **smart contracts** between trading partners, improved product data security, disintermediation and improved product visibility and traceability.

¹⁸ National Institute of Statistics (INE)

Technologies enhancing food safety: Blockchain

The next step is to **make blockchain technology more economically viable** and **build industry-wide acceptance** from the majority of food producers, supply chain participants, processors, and the government.

There are numerous startups whose purpose is to achieve a greater transparency in the supply chain through blockchain. For instance **Mercatrace**, a platform that offers **traceability of products from their origin**, handling and transportation, to the consumer's hands.

Likely, **Trazable** guarantees the quality and food safety of products, reducing errors in the production chain, saving time, and boosting confidence of consumers.

Big corporates are joining the sector as well. For instance, **Alcampo and Grupo Avicola Rujamar** are collaborating on a blockchain technology project to ensure free-range eggs are transparent, traceable, safe, and sustainable.

The Spanish cured ham company, **Navidul** has been awarded the Entrepreneurship Award by the **National Association of Meat Industries of Spain (ANICE)**, for being the **pioneers of the implementation of Blockchain technology in pieces of Ibérico**. By scanning a QR, the consumer can access the "truthful, complete and immutable" information of the piece.

Also, **Deoleo** has launched an initiative to **protect traceability and be transparent about its oils journey** along the entire value chain, through an app developed on the **IBM platform** based on **IBM Food Trust Blockchain technology**. **Deoleo** became the **first EVOO company in Spain to report the origin and traceability of its products through blockchain**.

Nutrasing focus its work on obtaining real transparency in the agritech sector. For this purpose, they have developed **Food Track™**, a **blockchain technology-backed platform** that makes it possible to identify a production batch and its path in a matter of seconds.



Nutrasing has developed Food Track™, a blockchain technology-backed platform that enables the creation of a unique, secure and immutable digital record of each product to provide source-to-table traceability.

Credits: Nutrasign©

Technologies enhancing food safety: Sensoring

The food sector is a highly regulated and controlled industry with systems to monitor processes and hygiene throughout food production. Innovation in this area include **promising sensors that enhance food safety** in every step of the agrifood value chain.

The technology behind sensors has been around for a long time, but it is rapidly developing. **Nulab**, a Navarra-based company, which holds a partnership with **CNTA**, is creating and developing equipment and devices that **measure food quality and safety in real time through sensor technology**.

AOTECH, a Bilbao-based company, has developed a platform for the online **measurement of different parameters based on spectroscopy**. This system allows real-time product characterization to ensure product quality from raw material input to final product.

From the very beginning of the value chain, traceability is essential for **detecting any problems with anticipation**, being able to prevent problems in the long run. With new projects and technologies, it becomes easier and more bearable to have all the information needed.

Another example is **Plantae**, a company that uses **self-manufactured sensor technology** to control the climate circumstances around any crop, providing data, graphs, and information for more efficient and realistic decisions.

For instance **AgroPestAlert**, a Navarre-based company, offers a functional, robust, reliable, and cost-efficient solution, which **provides farmers a “smart trap” to pests, which is later linked to a cloud information platform** allowing them to be aware of the presence of pests in the early stages of infestation, where they are most vulnerable to being controlled with fewer resources.

The result is a **lower discharge of chemical pesticides** into the environment, and lower ecological footprint.



The Navarra-based company, Nulab is developing equipment and devices that measure food quality and safety in real time through sensor technology.

Credits: Interempresas

Technologies enhancing food safety: Smart and active packaging

Innovations in food packaging have the potential to significantly reduce food waste and improve food safety. In this matter, the **active packaging** or **smart packaging** terms refer to food containers which hold indicators that provide information about aspects of the history of the package (such as time passed or temperature at which the food was kept) and/or the quality of the food (such as evidence of spoilage and freshness).

In Spain, startups are already working towards this sector. [Color Sensing](#), through their **smart packaging line FoodSensing** helps food manufacturers and retailers cut down food waste by adding quality to their products through an automatic, quantitative and cost-effective food freshness indicator, using their patented algorithm.

Similarly [Oscillum](#) develops smart packaging that with a simple color change, the **smart label can alert about spoilage or freshness of food** placed in contact with it preventing food waste.

On the other hand, active packaging systems protect food from contamination or degradation either by creating a barrier to outside conditions or by controlling the atmosphere within the package.

A Barcelona-based startup, [Bio2Coat](#), has developed an **edible coating made of 100% natural ingredients** that extends the shelf life of perishable foods like fruits and vegetables by creating a semi-permeable barrier that controls respiration rate.

This sustainable packaging leaves no residue and preserves foods' organoleptic characteristics. Also in Barcelona, [Oimo](#) is developing a portfolio of **marine degradable (4-6 weeks)** and **compostable packaging solutions** for manufacturers and end brands.

Co2change is a startup based in Madrid that **captures CO₂ and converts it into CO₂-based biopolymers** for creating natural and sustainable fertilizers, varnishes, and plastics.

The growing Spanish ecosystem opens the door to future collaborations between companies whose mission and values are aligned. As an example, **Oscillum** and **Bio2Coat** have the potential to collaborate to enhance the fruit and vegetable industry, generating exports with greater added value, including life extension, ripeness detection, or reducing food waste.



Bio2Coat has developed an edible coating made of 100% natural ingredients that extends the shelf life of perishable foods like fruits and vegetables

Credits: Bio2Coat

Foodtech in Spain

Addressing new challenges across the food value chain

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