

Foodtech in Spain

Fostering Collaboration
for Sustainable
Agri-Food Excellence



GOBIERNO
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MINISTERIO
DE ECONOMÍA, COMERCIO
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España
Exportación
e Inversiones



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Dear reader,

I am pleased to present the fourth edition of the annual report on the foodtech sector in Spain. In this brief period, we have observed how this network of companies, institutions, and corporations that make up the ecosystem has not only consolidated but has also forged alliances to address new challenges and markets. The recent emergence in December of FATE (Food & Agri-Tech Europe), created to seek synergies in the sector is further evidence of the trend towards collaboration and growth in the agrifood chain.

Spain will be one of the countries most exposed to the effects of climate change in the coming years. Our food industry is aware of this and is addressing the challenge of sustainability and efficiency with increasingly coordinated responses, also fueled by the agri-food PERTE (Strategic Project for the Recovery and Economic Transformation) that, both from the Ministry of Agriculture and the Ministry of Industry, has provided a significant injection of resources to accelerate investment in innovation at all levels of the agrifood supply chain.

From ICEX, over these four years, we have wholeheartedly supported the consolidation and international projection of our innovative ecosystem as an undisputed engine of growth for the entire food industry. In 2023, we carried out the third immersion of 7 startups in the Netherlands. We are also preparing two new immersions in the British and German ecosystems for 2024. We have also aimed to showcase Spain Foodtech Nation at AFTEA (Agrifood tech Expo Asia) in Singapore at the Sustainable Forum of Food Matters Live in the United Kingdom. ICEX has become a driving force for platforms like Food for Future in Bilbao or the FTalks of KM ZERO in Valencia and Mexico. We actively collaborate with Eatable Adventures and CNTA in their acceleration initiatives, Spain Foodtech, and Foodtech Challengers, respectively. In parallel, ICEX INVEST IN SPAIN, in its role of attracting foreign investment, carried out different initiatives with the aim of contributing to a more innovative and competitive foodtech ecosystem in Spain, like the Rising up in Spain program and the first Open Innovation in Agri-Food program in Brazil, a matchmaking event between Spanish corporations and Brazilian startups.

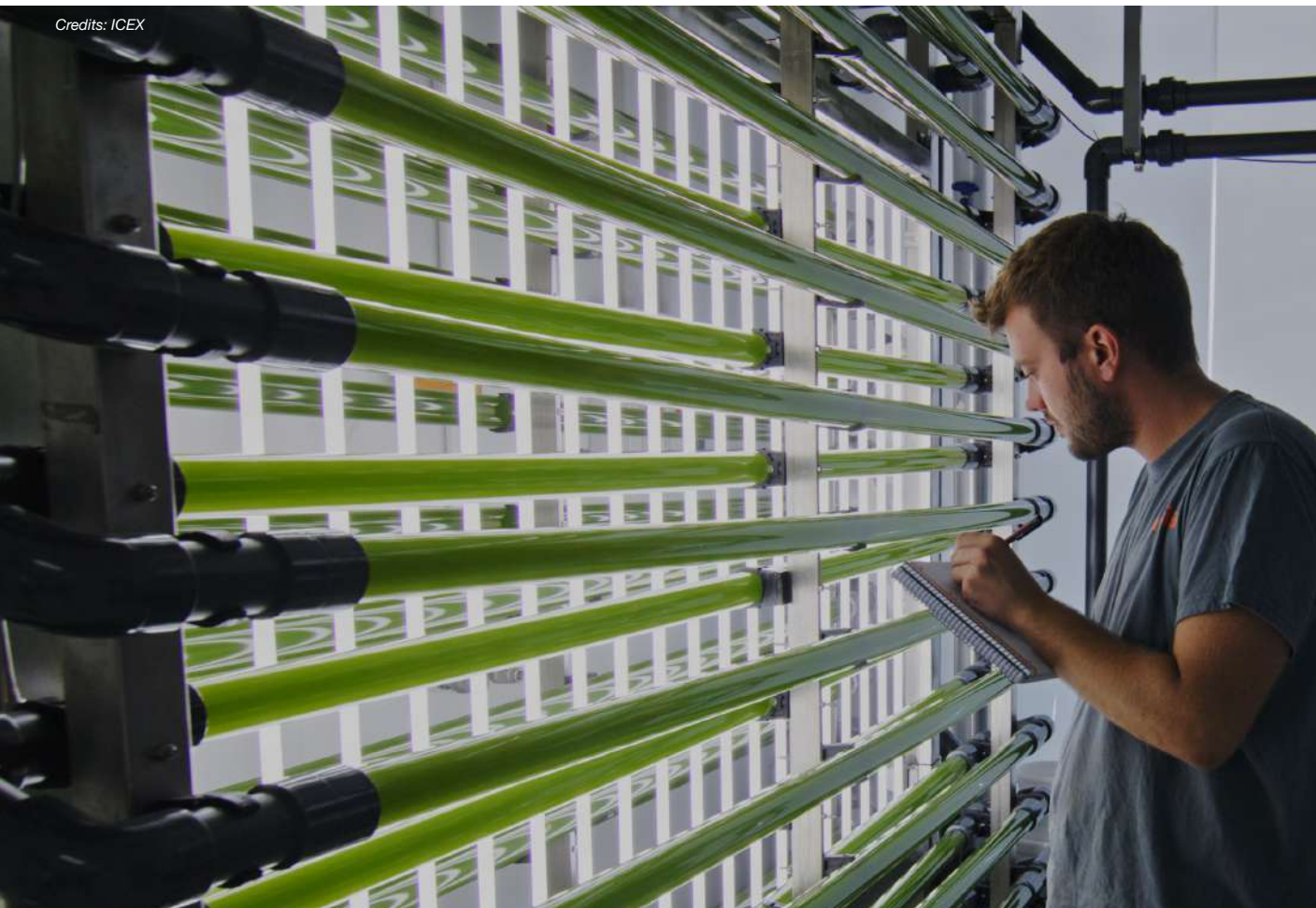
We are convinced that this strong commitment to innovation as a differentiating factor for our food industry is the best tool to add value and strengthen our export capacity and the future of our planet.

You may consult the previous editions [here](#).



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1

INTRODUCTION

INTRODUCTION



1 INTRODUCTION

Foodtech in Spain: Current state of Spain's Food System

In the face of a complex array of challenges, the Spanish agrifood sector has aptly demonstrated its inherent strengths and resilience.

Within the European economic landscape, the **Spanish food industry** claims the **fourth position** in terms of turnover, comprising **11.4%**, trailing behind **France (18.9%)**, **Germany (16.5%)**, and **Italy (12.8%)**¹.

Despite encountering a substantial downturn in crop production, largely attributed to adverse weather conditions and increased production costs, the sector exhibited a remarkable capacity to these adversities. The persistent surge in production costs, compounded by enduring drought conditions and external factors such as the initial impacts of the COVID-19 pandemic and the Ukraine conflict, resulted in a **6% growth in the GDP sector in 2022**².

In the midst of these challenges, a significant improvement surfaced in the first half of 2023, already experiencing a **GDP growth of 3%**. This positive adjustment underscores the sector's resilience and strategic approaches to stabilize production costs.

Highlighted as critical elements driving the escalation of production expenses are key factors such as energy, fertilizers, and animal feed. Notably, despite a **1.8% year-on-year reduction in food production** from January to July 2023, the beverage manufacturing sector demonstrated remarkable resilience. It exceeded its pre-pandemic benchmarks by being **7% above in beverage production** during the same period. This resilience underscores the sector's adept navigation of challenges and its ability to outperform expectations in a dynamic market landscape.



Credits: ICEX

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

More than **50** specialized universities

More than **20** cutting edge technological centres

420 Foodtech startups

¹ Informe Anual de la Industria Alimentaria Española Período 2022-2023

https://www.mapa.gob.es/es/ministerio/servicios/analisis-y-prospectiva/informecomextanual2022_rev5_tcm30-657480.pdf

² Production costs and drought are affecting Spain's agrifood sector <https://www.caixabankresearch.com/en/sector-analysis/agrifood/production-costs-and-drought-are-affecting-spains-agrifood-sector>



1 INTRODUCTION

Foodtech in Spain: Current state of Spain's Food System

The ripple effects of elevated costs throughout the food supply chain were inevitably felt by consumers, translating into a **10.1% increase** in the food Consumer Price Index by August 2023. Although some relief is expected due to falling commodity and energy prices, uncertainty persists, given the various factors impacting food prices, including extreme weather events and oil price fluctuations.

Despite the decline in production, Spanish agrifood exports have maintained a strong position in the global market.

Spain ranks seventh globally among exporters and fourth in Europe (trailing the Netherlands, Germany, and France but surpassing Italy), commanding **3.8%**³ of world exports. Since 2013, exports have shown a consistently positive trend, reaching a record figure of **€68,018B in 2022** (13.1% higher than in 2021)⁴.

Recognizing the nation's pivotal role in the agrifood sector, there has been a concerted effort to propel

advancements in critical areas essential for food production:

- Emerging Approaches in Presenting Alternative Proteins
- Important Investments in the Sector
- Technologies Ensuring Food Safety and Sustainability Across the Food Value Chain
- Solutions for Producing and Consuming Food in a More Sustainable and Efficient Manner
- Artificial Intelligence Role Throughout the Agrifood Value Chain.

The upcoming slides will meticulously examine the current landscape of Foodtech in Spain for the year 2023. These insights will provide a profound understanding of the sector's technological advancements, emerging trends, and transformative strategies.

This report signifies the fourth iteration, and [accessing previous editions](#) is essential for a comprehensive grasp of the sector's evolutionary trajectory.

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³ The challenge for Spain's agrifood sector of remaining competitive in the face of adverse conditions. <https://www.caixabankresearch.com/en/sector-analysis/agrifood/challenge-spains-agrifood-sector-remaining-competitive-face-adverse>

⁴ Informe Anual de Comercio Exterior Agroalimentario y Pesquero 2022. https://www.mapa.gob.es/es/ministerio/servicios/analisis-y-prospectiva/informecomextanual2022_rev5_tcm30-657480.pdf



1 INTRODUCTION

Transforming the food landscape: The Emerging Power of Foodtech

Foodtech encompasses all the players in the economy who blend innovation with the operations of the food sector, including all sectors from food manufacturing to consumption. To make the analysis more accessible, we've created a taxonomy structured around four main categories: **agritech, food manufacturing and processing, logistics and distribution, and restaurant technology.**

Within each of these sectors, numerous sources of innovation and technology exist, including biotechnology, robotics, blockchain, artificial intelligence, machine learning, and big data. By harnessing these technologies, the Foodtech ecosystem is getting closer toward tackling the sustainability issues that the agrifood industry faces.

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), Food safety
- e. **Food waste management** and circular economy.
- f. **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**



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SPAIN'S FOODTECH ECOSYSTEM

ECOSYSTEM

2

SPAIN'S FOODTECH ECOSYSTEM



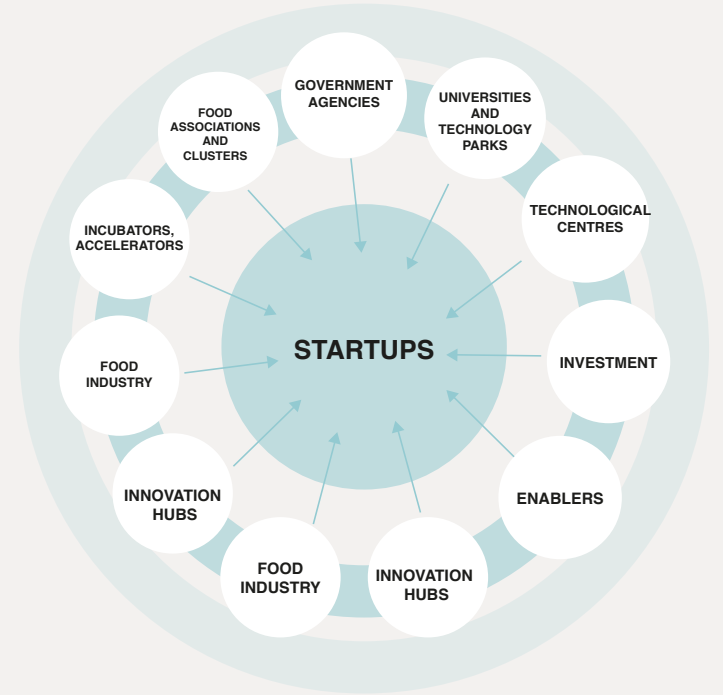
Introduction

Key Stakeholders in the Ecosystem

In 2023, the Spanish Foodtech community continues to expand and establish robust connections with industry stakeholders. There's a notable increase in engagement from various public and private institutions, all focused on developing innovative solutions for a variety of challenges. **Spain maintains its position as one of the most prolific ecosystems for foodtech entrepreneurship, with 420 startups, showing relative stability compared to the figures from 2022.**

Innovation hubs, technological parks, and centers are playing a pivotal role in this ecosystem, experiencing rapid development this year. They actively contribute to generating solutions that align with market demands.

This report will illustrate the escalated activity within the environment and explore the array of initiatives fostering collaboration within the ecosystem. The primary aim is to uncover sustainable and health-focused solutions within our food system.



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SPAIN'S FOODTECH ECOSYSTEM



Public Entities: The Vital Pillars of the Ecosystem

The agri-food industry holds strategic significance within the Spanish economy, influencing not only social and environmental aspects but also wielding considerable impact on **GDP and export potential**. Within the Spanish industrial landscape, the latest insights from the INE's Structural Business Statistics underscore the prominence of the **food and beverage sector**, as it holds a paramount position as the leading manufacturing segment. With a turnover of **€142,073.3M**, it constitutes **24.2% of the manufacturing domain**, **engaging 22.6% of the workforce and contributing significantly with 20.4%** to the overall value added⁵.

Reflecting its economic importance, the agri-food industry makes a substantial contribution of **2.4% to Spain's GDP in Gross Value Added (GVA)**, totaling **€24,899M** in **2023**. This underscores the sector's integral position in the nation's economic landscape, highlighting its resilience in the face of ongoing challenges⁵.

In this context, the **PERTE (Strategic Project for Economic Recovery and Transformation)** is conceived as a comprehensive set of measures aimed at fortifying the development of the agri-food chain. Initially allocated a public investment of **€1B** until 2023, an additional **€800M** was later designated for enhancing the agri-food industry, improving water management, and modernizing irrigation systems.

The strategic agri-food project focuses on **three key areas**: A **€400M** support package for the agri-food industry to improve **competitiveness, sustainability, and traceability of food production**; a **€454.35M** allocation for specific measures supporting **digital adaptation** throughout the value chain, benefiting farmers, cooperatives, and small to medium-sized enterprises; and a **€148.56M** investment in **innovation and research** to ensure **competitiveness** throughout the agri-food sector⁶.



Credits: ICEX

⁵ Informe Anual de la Industria Alimentaria Española Período 2022-2023: https://www.mapa.gob.es/es/alimentacion/temas/industria-agroalimentaria/20230728informeanualindustria2022-2023t23ok_tcm30-659567.pdf

⁶ PERTE Agroalimentario. <https://planderecuperacion.gob.es/como-acceder-a-los-fondos/pertes/perte-agroalimentario>

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SPAIN'S FOODTECH ECOSYSTEM



Public Entities: The Vital Pillars of the Ecosystem

As of now, funds allocated to the **Agri-food PERTE** in the initial phase of the **Recovery Plan** have **currently reached €747M**. The addendum enhances these investments, allocating **€410M** to support the modernization of more than **160,000 hectares of irrigation**.⁷

Furthermore, a call for proposals, totaling **€192M**, has been initiated to fund projects centered around **sustainability and circularity** in industrial and business processes. This endeavor is designed to boost the competitiveness and innovation of the industrial sector, aligning with the objectives of the **Circular Economy PERTE**.⁷

Within the framework of **PERTE** of the agri-food sector in Spain, driven by the **Ministry of Industry, Commerce, and Tourism**, **AINIA** technological center and **18 innovative companies** plan to invest **€48M in the AccelerEAT** project by June 2025.

The **AccelerEat** project encompasses a total of **22 collaborative primary projects** that will **accelerate the sustainable production of new foods and ingredients** based on alternative

raw materials (new plant varieties, insects, algae, fungi, microorganisms, by-products etc.) with a reduced ecological footprint.

The 18 companies participating in this consortium include 9 large food companies: **Vicky Foods**, **Bunge**, **Dacsa**, **Grupo Acesur**, **Agriconsa**, **Biotech Foods**, and **Aldelís**; and 11 small and medium-sized enterprises: **Grupo Carinsa**, **Trazable**, **Coccus**, **MOA Foodtech**, **Proteinsecta**, **Biorizon Biotech**, **Darwin Bioprospecting Excellence**, **Hifas da Terra**, **Tebrio**, **Valencian Farmers Association (AVA)**, and **Innolact**.

Similarly, **Spain Food Valley** will receive support from **PERTE**. The proposal, spearheaded by **CNTA (National Centre for Food Technology and Safety)**, has been chosen within the strategic project launched by the Spanish Government. The financial backing from **PERTE**, surpassing **€12M**, will facilitate the execution of the 28 projects detailed by **Spain Food Valley**. These projects will primarily focus on two key areas: enhancing the competitiveness of the agri-food industry by concentrating on digitalization, traceability, and food safety; and emphasizing sustainability as its secondary focus.



Credits: ICEX

⁷ Impulso a la Industrialización Estratégica. Septiembre 2023. https://planderecuperacion.gob.es/sites/default/files/2023-10/02102023_adenda_plan_recuperacion_documento_completo.pdf

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SPAIN'S FOODTECH ECOSYSTEM



Public Entities: The Vital Pillars of the Ecosystem

The [Department of Climate Action, Food, and Rural Agenda of Catalonia](#), along with the [Institute of Agrifood Research and Technology \(IRTA\)](#), has unveiled [Spain's first Center for Innovation in Alternative Proteins \(CiPA\)](#).

With funding of **€7M**, which will run for four years, [CiPA](#) is one of **the largest investments made in alternative proteins across Spain**, aims to establish itself as a leading center in Southern Europe for research and innovation. The center will help build essential infrastructure including research facilities and pilot plants, enabling startups to expand by providing them with the expertise and specialist equipment needed to develop, test and improve their fermented products. This process utilizes organisms like yeast to generate animal proteins and other ingredients, providing the taste and texture of meat, dairy, and eggs without the need for traditional animal farming.

[ICEX Spain Trade and Investment](#) has launched the third 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.

Furthermore, [ICEX Spain Trade and Investment](#) has recently launched the 7th edition of the [Rising Up in Spain program](#), an initiative aimed at attracting foreign startups to Spain.

Notably, this year, the inaugural [Open Innovation in Agrifood event](#) took place, promoting collaboration **between Brazilian and Spanish entities**. The event served as a matchmaking platform, connecting Spanish corporations with Brazilian startups and vice versa to address specific challenges.

Among the distinguished Spanish partners participating in the event were [Fundecyt-pctex](#), [Eatex](#), [Palacios Alimentación](#), [Covap](#), [Cluster Alimentaria Food+I](#), [Business Factory Food](#), [Agrobank Digital Innovation](#), and [Ecoembes](#). This collaborative initiative underscores the commitment to cross-border innovation and the creation of impactful solutions in the agri-food sector.



Credits: IRTA

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SPAIN'S FOODTECH ECOSYSTEM



The Agri-food Sector: Collaborative Transformation

The food and beverage industry comprises 30,159 companies, as indicated in the most recent data from the [INE's Central Business Directory](#), representing **17.6%** of the manufacturing industry and **15.7%** of the entire industry. Clusters and associations play a pivotal role within the ecosystem, fostering collaboration and offering innovation and networking platforms to foster leadership among diverse entities, as well as supporting the growth of main players in the sector.

The [Technological Corporation of Andalucía \(CTA\)](#), a private foundation and strategic partner that works to promote innovation, is spearheading the **Andalusian Bioeconomy Platform in the European** project [SCALE-UP](#). The Andalusian Circular Bioeconomy Strategy is supported by EU funding, aiming to propel sustainable growth and regional development through the promotion of renewable and biological products and processes. It's funded with nearly **€3M** through the **Horizon Europe program**, aimed at fostering the creation of new biological-based solutions. **CTA** is part of a consortium consisting of nine entities from eight countries involved in this project.

Another example is the creation of the [Association for Cellular Agriculture](#), a non-profit organization aiming to promote awareness about cellular agriculture in Spain. Dedicated to establishing the cellular agriculture ecosystem in Spain, the initiative aims to ensure a positive transition for people, the environment, and animals. It strategically positions the country as a hub for intellect, talent, and investment in science for overall well-being.

Furthermore, [ASINCAR](#) is a **private non-profit entity** evolving into a business association, **agro-food cluster**, and technological center originally from Asturias, Spain. It specializes in the **agro-food sector**, offering **training courses**, **technical services**, and **engaging in strategic projects** for technological innovation.

FATE (Food & Agri Tech Europe), was announced as the first Spanish business association in the Foodtech sector, powered by the startup ecosystem. **FATE** aims to become a reference in promoting and developing the foodtech industry in Europe.

Main associations and clusters

AGENCY	LOCATION
Acuipplus Cluster	National
AECOC	National
Asebio	National
Aragonese Food Cluster	Aragon
Association for Cellular Agriculture	Catalonia
Bioga	Galicia
Bioplat	Madrid
Biovegen	National
CLUSAGA	Galicia
FATE	National
FIAB	National
FOOD+i Cluster	Navarre
Food For Life	Madrid
Foodservice Cluster	Catalonia
NagriFood Cluster	Navarre
PTV Vino	Madrid
Technological Corporation of Andalucía (CTA)	Andalusia
Vegetales	National
VITARTIS	Castile and Leon

Source: prepared by the author

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SPAIN'S FOODTECH ECOSYSTEM



Technological Centres: Keys to combining technological excellence and flavor

Innovation is steadily gaining traction throughout the entirety of the Spanish economic landscape. Technological centers in Spain play a pivotal role in steering the nation's innovation agenda, actively engaging in collaborative projects within the ecosystem, with a clear emphasis on fostering sustainable solutions to contribute to a more resilient and environmentally conscious food system.

In this context, [CNTA](#) and [FUDin by CTIC-CITA](#) join forces to create the **main private technology center specialized** in the agri-food sector in Spain. CNTA will become a leading center in fermentation technologies, alternative proteins, texturization, food preservation along with food quality and food safety.

In this matter, the [technological center AZTI](#) is engaged in the **Tecnomifood Network project**, providing companies in the food sector access to omics technologies.

The Tecnomifood Network carries out contracts worth **€3.25M** with companies, employing omics technologies for innovations in functional foods and nutraceuticals.

Also, [AZTI](#) also aims to strengthen and unite the entire Spanish agri-food ecosystem to drive sustainable growth, fodegate economic activity, attract and create quality employment, and contribute to the achievement of a modern and quality food industry through the creation of **ECOFOOD 3S**, a strategic project for economic recovery and transformation, which involves an investment of **€200M**.

Main technological centers

AGENCY	LOCATION
AINIA	Valencian Community
ANFACO-CECOPESCA	Galicia
AZTI	Basque Country
CARTIF	Castile and León
CNTA	Navarre
CSIC	National
CTAEX	Extremadura
CTNC	Murcia
CTIC CITA	La Rioja
EURECAT	Catalonia
FUDin	La Rioja
I+DEA	Castile and León
IFAPA	Andalusia
IVIA	Valencian Community
IRTA	Catalonia
LEITAT	Catalonia
MAAVi Innovation Center	Andalusia
NEIKER	Basque Country

Source: prepared by the author

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SPAIN'S FOODTECH ECOSYSTEM



Technological Centres: Keys to combining technological excellence and flavor

Furthermore, the **Government of Spain**, through the [Ministry of Economic Affairs and Digital Transformation](#), "[SpAIIn Talent Hub](#)" program with the [Monterrey Institute of Technology](#), [University of Oviedo](#), a talent support program offering scholarships and mobility assistance for researchers. Both academic institutions will establish the '**European Center for Entrepreneurship and Innovation in Digital Technologies**' in **Asturias**.

TECNALIA, is also a Spanish premier center for applied research and technological development, a key player in Europe and a member of the Basque Research and Technology Alliance. Committed to transforming technological research into prosperity, they collaborate strategically with companies, focusing on smart manufacturing, digital transformation, energy transition, sustainable mobility, health, nutrition, urban ecosystems, and circular economy. TECNALIA's leadership in the European Commission's Horizon Europe program ranks it fourth in European patent applications. Their mission is to drive prosperity through technology, contributing to a better society and future.

To end, **NEIKER** is a public entity dedicated to serving the productive sector and society. It is a member of **BRTA**, the **Scientific-Technological Consortium of the Basque Country**, aligning with its primary goal of fostering cooperative efforts to address technological and industrial challenges in the region and enhance its global standing. This strategic collaboration underscores their commitment to advancing technology for the benefit of the Basque Country's economic and international growth.



Credits: TECNALIA

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SPAIN'S FOODTECH ECOSYSTEM



University and Technology Parks: Harnessing Science for Startups and Industries

Universities conventionally conduct their research within science parks, strategically equipped with state-of-the-art technology conducive to scaling innovative solutions. These institutions play a pivotal role in fostering the development of startups heavily reliant on cutting-edge technology.

[The Association of Technology Parks \(APTE\)](#) is an organization primarily focused on collaborating through the promotion and dissemination of science and technology parks, grouping all of these parks at a national level.

For instance, an international team of experts, led by researchers from the **Institute of Subtropical and Mediterranean Horticulture 'La Mayora' (IHSM-CSIC-UMA)** and the **Institute of Materials Science (ICMS-CSIC-US)**, situated within the [Scientific and Technological Park Cartuja](#) in Seville, has developed **resins**, with the tomato's byproduct. These innovative resins aim to replace the current BPA lining inside metal food containers, including cans for preserves and beverages.

On the other side, the [University of Barcelona](#), in collaboration with [TranXforma FOOD](#), has initiated a strategic partnership to foster entrepreneurial activities, innovation, and knowledge transfer within the agri-food sector, through the newly established Focus **InnoFood UB platform**. It will serve as a dynamic hub involving multiple companies and institutions. This collaboration, facilitated through the [Torribera Food Campus](#), aims to address challenges, in the fields of food, nutrition and gastronomy, crucial to the Spanish economy.

Main universities and technological parks

Basque Culinary Center	Parque Científico Tecnológico de Almería Parque Científico Tecnológico de Cartuja
Cátedra John Deere con la U.Politécnica de Madrid de Agricultura de Precisión.	Parque Científico Universidad Carlos III de Madrid-Leganés Tecnológico (UC3M)
Cátedra Telefónica de la Universidad de Extremadura	Parque Científico y Tecnológico de la Universidad Politécnica de Madrid
ESADE Creapolis	Parque Científico de la Universidad Miguel Hernández (PCUMH) de Elche
ETSIAM-Universidad de Córdoba	Parque Tecnológico de Galicia
Fundación Aula Dei	Tecnópole UCTA
IMDEA Alimentación	Universidad Pública de Navarra
Instituto Tecnológico de Murcia	Parc Científic Valencia
Parc Científic de la Universitat de València	Parc UPC
Parc UPC - Universitat Politècnica de Catalunya - BarcelonaTech	Universitat Politècnica de Catalunya
Parque (Euskadi Technology Parks) Parque Científico de Alicante	BarcelonaTech
Parque Científico de Madrid	ParcBit

Source: prepared by the author

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SPAIN'S FOODTECH ECOSYSTEM

Open Innovation Programs: Corporate Partnerships for Startup Success

The Spanish food industry is strategically embracing open innovation initiatives as a pivotal component of its innovation approach, notably through diverse collaboration models with startups.

Damm, a leading company in the food and beverage sector with a presence in logistics, distribution, and hospitality, launches its **open innovation program LAB1876** to transform it into a global platform for finding disruptive and innovative solutions.

The **Catholic University of Murcia High-Tech incubator (UCAM)** has partnered with **Plug and Play**, the U.S.-based open innovation platform, to **promote open innovation in Spain**. This is the first agreement of its kind between the U.S. platform and a Spanish university, expanding the international scope for the Spanish Ecosystem.

The **TECNALIA research and technological development center**, in collaboration with the **TranXforma FOOD innovation platform**, is working to enhance the agri-food industry ecosystem. Their partnership aims to **provide training and facilitate connections** among various stakeholders in the value chain, with a particular emphasis on **small and medium-sized enterprises (SMEs)**. Their efforts are dedicated to addressing challenges and creating new market opportunities through the "**company building**" and subsequent "**scale-up**" models. This complements and enriches other existing instruments within the entrepreneurial ecosystem.

On the other side, **EROSKI** has initiated the **Eroski Venture Program**, aimed at creating innovative solutions to address sector challenges, and dedicated to **Open Innovation** as a pivotal force for delivering optimal solutions.

Innovative Food Companies

COMPANY	ACTIVITY
Aldelis	Startups investment
Agrar!A	Consortium
Areas	Startups investment
Angulas Aguinaga	Open Innovation Programs
Calidad Pascual	Startups investment
Campofrío	Open Innovation Programs
CAPSA	Startups investment
Catholic University of Murcia High-Tech incubator	In-house research centre
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
Vicky Foods	Open Innovation Programs
TranXforma FOOD	Open Innovation Programs
Km Zero Venturing	Open Innovation Programs
Eroski Venture Program	Open Innovation Programs

Source: prepared by the author

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SPAIN'S FOODTECH ECOSYSTEM



Open Innovation Programs: Corporate Partnerships for Startup Success

Following the success of the first edition, [Areas](#), international leader in food&beverage and travel retail with global headquarters in Barcelona, launches the second edition of the '[Areas for Change Challenge](#)', in collaboration with [Eatable Adventures](#), an initiative aimed at startups with the goal of finding concrete and feasible solutions that respond to the company's own challenges for the coming years and those of the Food & Beverage and Travel Retail sector, on this occasion, in terms of **sustainability**.

[COVAP](#), an Agri-food Cooperative, emphasizes open innovation through [GEN_](#), its startup-focused open innovation program. [GEN_](#) addresses strategic challenges faced by the cooperative, merging internal expertise with external entrepreneurial talent. The inaugural edition selected four Spanish tech and digital startups, offering solutions in areas like Sustainability, Consumer Relations, Agrotech, and New Products within the agri-food chain.

In the latest [KM Zero Venturing program](#), a Spanish initiative of open innovation and strategic investment for startups in the agri-food sector, partnered with nine leading companies, including [Mahou San Miguel](#), [Makro](#), [Incarlopsa](#), [Helados Estiu](#), [Embutidos Martínez](#), [Platos Tradicionales](#), [CAPSA VIDA](#), [Vicky Foods](#), and [Grupo Arancia](#). The program now accommodates up to 20 promising projects, with a significant collaboration with 18 investment funds bringing a total potential investment of **over €2.5B**.



Credits: ICEX



Credits: Areas

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SPAIN'S FOODTECH ECOSYSTEM



Innovation Hubs, Incubators, and Accelerators: Nurturing Foodtech Startup Growth

Innovation Hubs, Incubators, and Accelerators play a pivotal role in fostering the growth and success of Foodtech startups. In Spain, both public and private entities are actively contributing to the development of the Foodtech ecosystem.

In 2023, [Spain Foodtech startups program](#), a “country” program led by [Eatable Adventures](#) in collaboration with [ICEX Spain Export and Investments](#) and [CNTA \(National Center for Food Technology and Safety\)](#) led its second edition. Its mission is to support the construction and development of robust Spanish startups in the Foodtech field, capable of competing globally and becoming a reference in the industry, positioning Spain as a technological leader.

On another side, [Pascual Innoventures](#), the Corporate Venture arm of Spanish dairy and beverage manufacturer [Pascual](#), has teamed up with [Eatable Adventures](#) to launch [Mykfcubator: More Than Mylk](#), the world's first program dedicated to advancing cellular agriculture and fermentation technologies in alternative food production and CPG offerings. The third edition of Mykfcubator explores innovations for biosynthetic dairy products, as well as emerging technologies related to alternative egg, coffee, lipids and cocoa, sodium and sweetener replacements, and functional ingredients.

[Madrid Food Innovation Hub](#), the business incubator within the food sector of [Madrid Emprende](#), held its **second Startup Day**, showcasing this year's incubated startups which engaged with investors, potential collaborators, and clients, providing them with insights into the most innovative projects and facilitating the establishment of potential synergies.

[Km Zero Food Innovation Hub](#) drives entrepreneurs and constructs innovative businesses in the food sector, enabling anticipation of the future of food through open innovation. As a hub, their role involves developing disruptive projects, offering invaluable experience, financial acumen, and profound knowledge of the industrial and corporate sectors.

Accelerators, incubators and Innovation hubs in the Spanish food sector

AGENCY	FOCUS	CAPITAL
Business Food Factory	Agri-foodtech	Public Agency
CajaMar Innova	Water Business	Private
Culinary Action!	Agri-foodtech	Private
Eatable Adventures	Agri-foodtech	Private
EIT Food	Agri-foodtech	Government
Fishing Tech	Agri-foodtech	Private
Global Food Accelerator	Foodtech	Academic Institution
Lanzadera	General	Corporate
Mykfcubator: More Than Mylk	Agri-foodtech	Corporate
Porcinnova	Agri-foodtech	Public Agency
Spain Foodtech	Agri-foodtech	Private+public
The Hop by Estrella Galicia	Rest-tech	Corporate
Madrid Food Innovation Hub	Agri-foodtech	Public Agency
Km Zero Food Innovation Hub	Agri-foodtech	Private

Source: prepared by the author

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SPAIN'S FOODTECH ECOSYSTEM

Events: Spain's National and International Forums

In today's interconnected world, networking is crucial for success in all industries. The achievements of our Spanish startups on a global level are outstanding. From actively participating in international open innovation programs to winning prestigious awards and forging impactful collaborations, these successes showcase the Spanish agrifood ecosystem innovation and influence on a broader scale.

A team of innovative founders from Spain joined the III edition of the [DESAFIA program](#) in the Netherlands, an initiative by [ICEX](#) in partnership with [Unknown Group](#), aimed at boosting Spanish food scale-ups in the **Dutch market**. Over two weeks, seven Spanish-based entrepreneurs explored significant locations in the Dutch food ecosystem. Through networking with industry leaders, they gained valuable insights into global food innovation, broadening their perspectives and enriching their expertise.

[ICEX](#) participated for the first time with a Spain Foodtech Nation Pavilion the [Agri Food Tech Expo Asia \(AFTEA\)](#) in **Singapore**, a leading professional fair in the Southeast Asian food innovation sector and the key event of the [Singapore International Agrofood Week \(SIAW\)](#), leveraging the latest innovation from pioneering Spanish startups that are helping to shape the future of food, including [Sanygran](#), [Ataraxial](#), [Ingredalia](#), [Oscillum](#), [Moa Foodtech](#), [Innomy](#), and [Cultzyme](#).

Furthermore, [ICEX](#) has [showcased 11 of Spain's leading innovators](#) in the [Sustainable Food Forum in London](#), organized by [Food Matters Live](#), presenting their disruptive innovations in the food ingredients, formulation and processing sectors. The highlighted Spanish agents included: [AZTI](#), [EATEX](#), [Bio2Coat](#), [CocuuS](#), [Cultzyme](#), [Dacsa](#), [Eatable Adventures](#), [Ingredalia](#), [Levprot Bioscience](#), [Moa Foodtech](#), and [Nucaps](#).

Main events in the Spanish food ecosystem

EVENTS	LOCATION
Alibetopias	Madrid
Alimentaria Foodtech	Barcelona
Biospain	Pamplona
Datagri	Zaragoza
Eit Food Innovation Forum	Bilbao
ftalks Food Summit	Valencia
Food4Future	Bilbao
Food Design Festival	Madrid
Foodture	Barcelona
Free From Functional	Barcelona
Gastroemprendedores	Madrid
Hospitality Innovation Platform (HIP)	Madrid
Smart AgriFood	Malaga
Startup Olé	Salamanca
Trend Builders	Barcelona
Vegan Cheese Petit Salon	Madrid
Foodtech events	Barcelona
Premios Emprendedores	Madrid
DESAFIA program	International with Spain presence
Agri Food Tech Expo Asia	International with Spain presence
Sustainable Food Forum in London	International with Spain presence
ICEX webinars	International with Spain presence
El Europe	International with Spain presence

Source: prepared by the author

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SPAIN'S FOODTECH ECOSYSTEM



Events: Spain's National and International Forums

In this year's [Food 4 Future](#) event, DESAFIA-affiliated companies received recognition for their achievements. [Bread Free](#) won the [Foodtech Innovation Awards 2023](#) in the 'Healthy Food' category for their patented technology producing gluten-free wheat flour suitable for individuals with celiac disease. [NUCAPS](#) was honored with the [ICEX Award for the 'Spanish Startup with the Greatest International Projection'](#) for their NextGen Functional Ingredients, offering microencapsulated bioactive proteins and probiotics with enhanced nutrition, cost-effectiveness, and health benefits. [Bio2coat](#) was one of the winners of [Food Tech Startup Forum 2023](#) thanks to its innovative product that increases the shelf life of food. Lastly, [Ingredialia](#) secured the [CNTA Eatex prize](#) for its groundbreaking platform, employing science and technology for the development and industrialization of functional ingredients sourced from by-products of the industry.

Online events play a pivotal role in the process of internationalization. In this regard, [ICEX](#) has hosted several webinars with international stakeholders on agrifood topics, catering to both national and international audiences.

This year, the inaugural edition of the [ICEX webinar featuring Spanish startups](#) collaborating with key stakeholders from the Swiss Foodtech ecosystem, in partnership with the [Swiss Food & Nutrition Valley \(SFNV\)](#), took place. Six Spanish startups—[Vegasauria](#), [Blue Marine Oil](#), [Nucaps Nanotechnology](#), [Néboda Farms](#), [Taste Lab](#), and [Algas La Patrona](#)—spanning a diverse spectrum of the foodtech industry presented their projects to SFNV partners, multinational companies, as well as other Swiss Foodtech startups and scaleups.

Furthermore, [ICEX](#) organized another [webinar](#) exploring the pivotal role of Spanish startups in advancing food security through the integration of **Traceability & Technology**. The aim was to emphasize Spain's contribution to enhancing traceability and food safety in the agrifood value chain. The event showcased collaborations between startups and industry leaders in this sector, featuring [CNTA](#), [Nulab](#), [Bio2Coat](#), and [Oscillum](#), presenting these solutions to a national and international public.

Also, [ICEX](#), along with the [Economic and Commercial Offices of the Embassy of Spain](#) in **Singapore**, organized a [webinar](#) where **Singapore** was presented as a unified economy, a singular market into which to venture by capitalizing on the synergies of both countries.

The fifth edition of [ftalks Food Summit](#), a prominent food innovation event in Europe, took place in Valencia, organized by the [KM ZERO Food Innovation Hub Foundation](#), over 500 industry leaders gathered to explore the latest trends and discuss solutions for a better future in the food sector. At the FTalks event, the **FTalks Food Summit Awards** honored 15 finalist startups. The most sustainable startup, **Spread Sensations from Valencia**, known for its carob spread, and the most innovative startup, [Levprot Bioscience](#) from Aragon, were recognized. Notably, both companies received a financial grant of **€5,000**, marking a first in the history of the event, supported by [Solulim](#) and [Vicky Foods](#).

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SPAIN'S FOODTECH ECOSYSTEM



Events: Spain's National and International Forums

[Alimentaria FoodTech](#), the trade event focused on machinery, equipment, technology, and ingredients for the agri-food industry, presented the **Innova and Emprende Awards to four Spanish startups**. [Genbioma Aplicaciones](#) secured the Health and Wellness award for its solution that enhances metabolic functions. [The Wine Luthier](#) achieved success in **Smartagro** for its assistance to the wine sector. [Cleanwood Technology](#) was honored with the **Sustainability and Circular Economy** award for its barrel disinfection and regeneration. [Biobee Technologies](#) received recognition for its food industry microchip under the Impact on transformation and conservation category.

In the domestic space, two notable Spanish startups, [Moa Foodtech](#) and [Mmimco Eats](#), emerged as **finalists** for the **Foodtech Innovation Award** at [FI Europe](#), a prominent international event held in Frankfurt, Germany.



Credits: Mundo Healthy



Credits: Vacka

The '[Ingenia Startup Awards](#)', has been awarded to three disruptive Spanish startups including [Bread Free](#), [Mundo Healthy](#), and [Vacka](#). Supported by the **Spanish Federation of Food and Beverage Industries (FIAB)**, the **Technological Platform Food for Life-Spain (PTF4LS)**, and the **Ministry of Agriculture, Fisheries, and Food (MAPA)**, these awards allow new companies to showcase their innovations in an international spectrum.

The inaugural edition of "**The Green Revolution Awards**" occurred during the fourth edition of [Lantern's](#) report, "**The Green Revolution**," at **ICEX** in Madrid. These awards, designed to acknowledge innovation in the plant-based sector, featured winners across three categories, evaluated on criteria such as differentiation, relevance, nutrition, and organoleptic factors. [Hello Plant Foods](#) new product- **Fuah!**, a vegan alternative to animal-origin foie gras, secured the accolade for the top innovation in plant-based alternatives to animal products, [Bonduelle](#) claimed the honor for the best innovation in plant-based products, and the Spanish-based restaurant, [Honest Greens](#), was recognized for the best plant-based concept in Horeca.

Lately, [Cocuus](#), a Navarrese company specialized in the bioprinting of plant-based and subproducts meat alternatives, has won the "**Innovation in Agri-Food Award**" in the "**XIX Premios Emprendedores**" in Madrid.

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SPAIN'S FOODTECH ECOSYSTEM



Enablers: Media Spotlight on Food Innovation

Staying abreast of the ever-evolving Foodtech industry is crucial. However, Spanish media showcases proficiency in aggregating the latest industry developments. Throughout the past year, this sector has garnered significant support.

In the [Foods & Wines from Spain \(FWS\)](#) webpage, detailed updates on Foodtech, including both **weekly and monthly publications**, serve as a valuable resource for staying informed about the latest trends and developments in the Foodtech ecosystem.

[TechFood Mag](#) rises as a widely recognized and esteemed **Spanish Foodtech media**, delivering the latest scoop and analyses on innovation and food tech for companies, startups, investors, and key players in the dynamic realm of the food industry.

Furthermore, [Techpress](#) has a dedicated section for Foodtech, providing coverage of the latest news in the sector.

[Alimarket](#) continues to send its daily newsletters covering the latest news in the food sector in Spain, keeping the population updated on investments, launches, collaborations, and more.

[FooduristicBites](#) emerges as a media, providing an insightful exploration into the realms of the food sector and the dynamic landscape of open innovation. Thoughtfully categorized into sections such as articles, interviews, opinions, podcasts, reports, news, recipes, and more, it serves as a comprehensive resource for those navigating the intersection of food and innovation.

Lastly, [Vegconomist ES](#) continues at the forefront as the magazine for vegan businesses, including its newsletter to receive the most important news from the world of vegan business.

Main enablers in the Spanish food sector

ENABLERS	TYPE
Alimarket	Online / Magazine
Foods & Wine from Spain	Online
Techpress	Online
Tecnoalimen	Online
The Collider	Online
TechFood Mag	Online
Vegconomist	Online
Fooduristic Bites	Online

Source: prepared by the author



3

**SPAIN'S
FOODTECH
STARTUPS**

START
UPS

3

SPAIN'S FOODTECH STARTUPS



Startups: Current state of Spain's Food System

Amid the **observed slowdown in tech** investment across Europe, distinct positions emerge among various countries. The **UK leads** with a substantial projected **capital investment of \$12.7B**, followed closely by **France with \$8.0B**, and **Germany securing the third spot with \$7.8B**. Notably, **Spain claims the 7th position**, emphasizing its significance in the regional tech investment landscape. Optimism about the future of European technology is widespread, with Poland, Portugal, Spain, and Norway demonstrating noteworthy positivity, reflecting shared confidence in the sector's growth potential.

The absolute count of funded startups and scaleups reveals the **UK, France, and Germany as leaders**, boasting around **23,000** funded companies collectively. **Spain** holds a substantial position with over **2,500 funded tech companies**, signaling an active and growing startup ecosystem. The unicorn landscape, representing billion-dollar companies, paints a picture of **diverse entrepreneurship** across Europe.

The **UK leads with 104 unicorns**, followed by **Germany (54)** and **France (38)**. **Spain**, ranking 7th in this category, significantly contributes with less than **\$25B+** companies. In terms of \$B+ exits, mature ecosystems in the **UK, Germany, the Netherlands, and Sweden** secure the highest counts. Spain, holding the 8th position, engages in a balanced mix of IPOs and M&A activities, aligning with broader European trends. Per capita measures present intriguing insights, with **Estonia** leading in \$B+ company density, while Spain, despite its active ecosystem, ranks 22nd, indicating potential for further growth concerning its population size. This dynamic landscape underscores the diverse and evolving nature of the European tech scene, with each country contributing unique strengths and opportunities to the broader narrative of technological innovation⁹.

The investment landscape in **Spain has propelled it to the 10th position globally** in the agri-food tech sector from 2014-2022, for startups with a strong technological foundation. While Spain may be 10th in the rankings, its growth rate is nothing short of remarkable and surpasses that of many other nations. Since 2014, Spain's FoodTech sector has **maintained a staggering 20% Compound Annual Growth Rate (CAGR)**. Comparing Spain to its European counterparts, in 2022 it occupied the fifth spot in Food Tech, after the United Kingdom, France, Sweden and The Netherlands. This places Spain in close proximity to other nations with prestigious reputations and high levels of investment, and its potential extends far beyond its borders and is positioned on the global stage¹⁰.

⁹ Atomico, State of European Tech 23, 2023

¹⁰ The State of Foodtech in Spain (2022). Eatable Adventures: <https://www.eatableadventures.com/report-eng-2022/>

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SPAIN'S FOODTECH STARTUPS



Startups: Current state of Spain's Food System

According to the research conducted by [Eatable Adventures](#)¹¹, findings indicate that **28% of the 420 startups** in Spain currently hold **at least one patent**, depicting a **decrease of 5 percentage points** from the previous year. Interestingly, **35%** of the total startups are now utilizing **trade secrets**, showcasing a **6 percentage point increase** compared to the preceding year. This shift in data indicates a growing preference for trade secrets as a protective model, contrasting with the trends observed in the previous year.

In the landscape of technological advancements, startups in 2023 have continued to foster internal development of their technological foundations. Notably, **biotechnology** has emerged as the most extensively utilized technology, experiencing significant growth since 2022. Following closely are **machine learning and artificial intelligence**, which, although witnessing a slight decrease, remain prominent players in the technological landscape.

420
Startups

28%
Have Patents

35%
Trade Secret

Source: Eatable Adventures, 2023

DEEPTECHS EMPLOYED 2023

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

Source: Eatable Adventures, 2023

¹¹ The State of Foodtech in Spain (2023). Eatable Adventures: <https://eatableadventures.com/report-2023-eng/>

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SPAIN'S FOODTECH STARTUPS



Startups: Technology Fueling Innovation in the Food Sector

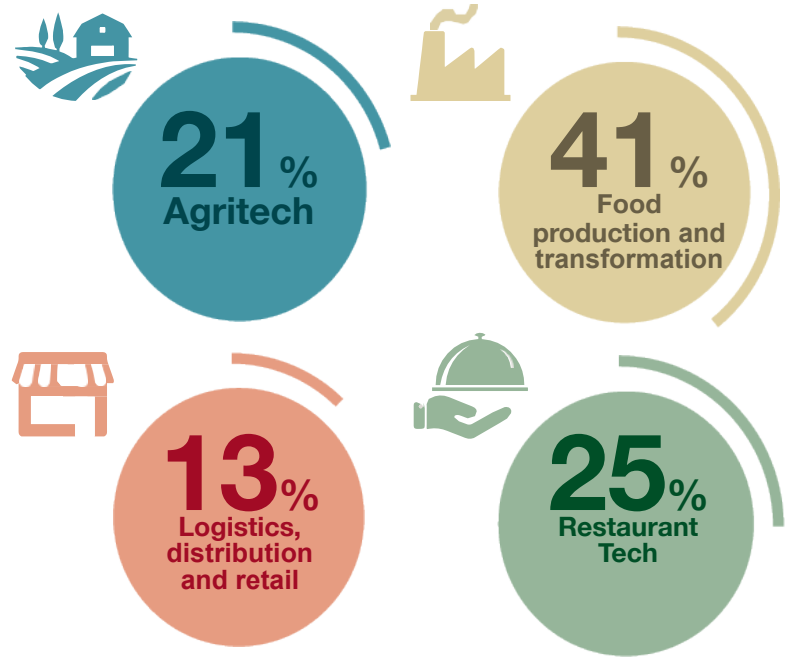
Throughout 2023, Spanish FoodTech startups have maintained percentages that align relatively closely with those observed in other ecosystems. However, notable shifts have been observed within the categories.

Agritech presently constitutes **21%** of startups, reflecting a slight decline of **3 percentage points** from the previous year's figure of **24%**. This suggests a modest loss of momentum, potentially attributed to strategic pivots and shifts in investment priorities.

The Food Production and Processing sector has taken the lead, foreseeing to achieve 41% expansion, reflecting an increase of 7 percentage points from the previous year. This growth can be attributed to heightened demand for innovations in food production and a focus on more efficient food processing, which has attracted substantial investments.

Conversely, **the Logistics and Retail sector, currently at 13%, exhibits the least representation, experiencing a decline of nearly 12 percentage points from 2022.** This shift may be attributed to the reclassification of startups from traditional distribution and logistics to delivery services.

In the **Restaurant Tech and Delivery sector**, there is a noteworthy representation at **25%**, showcasing growth in restaurant technology and delivery segments, solidifying its status as a significant and expanding sector.



Source: Eatable Adventures, 2023

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SPAIN'S FOODTECH STARTUPS



Startups: Technology Fueling Innovation in the Food Sector

Once again this year, we have analyzed all startups integrating innovation across the value chain, further categorizing them for a comprehensive assessment.

Within the **AgriTech** domain, the predominant focus remains on startups engaged in cultivation systems. While there persists a robust interest and investment in novel cropping techniques, the growth rate of startups in this sector has moderated compared to the figures from 2022.

In the realm of **Food Production and Processing**, startups dedicated to **novel product development** constitute over **40%**¹² of the total, with those exploring innovative ingredient sources following closely.

Throughout 2023, the **Logistics and Retail** sector retained its relevance, particularly with a substantial presence of startups operating in analytical retail platforms (**47%**). Meanwhile, the category of new sales channels experienced a slight decline to **22%**, possibly indicating a shift toward a delivery-centric business model.

Finally within the **Restaurant Tech and Delivery** sphere, management platforms continue to claim the foremost position, with **30%** of startups operating in this domain—a figure consistent with the previous year's findings.



Credits WEVO

¹²The State of Foodtech in Spain (2023). Eatable Adventures: <https://eatableadventures.com/report-2023-eng/>

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SPAIN'S FOODTECH STARTUPS



Startups: Noteworthy Achievements of Spanish Companies Abroad

In a global economic landscape, Spanish companies have emerged as key players, making substantial contributions beyond national borders.

Bio2Coat, the Spanish specialist in post-harvest treatments that extend the shelf life of fruits and vegetables, is heading to **Brazil** and envisions launching its first pilot-scale production facility.

Only after a few years in business, Spanish-based **Quevana's** vegan cashew cheese retailers in 150 of the 600 **Dutch Jumbo** supermarket chain shops in The Netherlands, and at specialised shops in countries such as **Qatar, Bahrain, Portugal, Letonia, Estonia, Poland** and **Lithuania**.

Heura has achieved sales exceeding **€30M**, propelled by international growth. The brand is present in major **European supermarket chains** in the UK, France, and Switzerland, and its expansion continues, with a **75%** increase in retail points, reaching 22,700 stores. **International sales have more than tripled**, contributing **23%** to the total turnover, compared to **12%** in 2021. The 2022 fiscal year closed with a revenue of **€31.4M**, a significant **77%** increase from the **€17.7M** in 2021. Noteworthy growth has been observed in the **United Kingdom, France, and Italy**, with Heura also making strides in **Switzerland** and **Austria**.

Cocuu, the producer specializing in **3D-printed plant-based bacon**, is strategically positioning for a launch in the UK market.

CoverManager, the Seville-based startup specializing in restaurant reservation management, is accelerating its international growth through **the merger and acquisition of the French company Guestonline**. With this strategic alliance, the Andalusian technology company solidifies its position in Europe and Latin America following the acquisition.



Credits Navarra Ok Diario

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SPAIN'S FOODTECH STARTUPS



Startups: Disruptive Spanish Food Launches Revolutionizing the Market

Startups and research initiatives persist in spearheading innovation within the protein alternative sector. Specifically in the realm of **meat alternatives**, several Spanish enterprises are actively engaged in diligent research and development efforts, aiming to introduce new products that align with the rising consumer demand.

Moa Foodtech presents its version of **plant-based pork using only two ingredients**, in its mission to "elevate plant-based meat analogs to the next level, showcasing the power of fermentation to create nutritious, sustainable, and umami-flavored products."

The plant-based specialist, **Heura**, expands its product range by introducing its version of "**jamón york**" (York ham), further targeting one of the most sought-after references in the meat product section.

Libre Foods, based in Barcelona, announces the **launch of the first chicken breast** developed from **mycelium** in the EU, selling it at a more competitive average price than equivalent products in the plant-based category, and even lower than conventional organic chicken.

Leveraging new technologies, in this case the high-pressure processing (HPP) tech, a new brand has developed a **clean-label meat alternative** using **carob**, launched under **Leggie**, made with only six ingredients.

Lastly, **Sanygran**, specializes in **innovative plant-based food products** based on different types of legumes, commercialized by **Legumeat**, **Buenggies**, **Santy's** and **Veggie&Nuts**. Sanygran is actively engaged in a protein concentrate extraction project, responding to current sector demands.



Credits Leggie



Credits MOA foodtech

Startups: Shaping the Future of Value Chain Innovation

Agritech

Food production/transformation

Logistics, distribution & retail

Restaurant Tech

New entries



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**SPAIN'S
FOODTECH
STARTUPS**

IN
VEST

4

INVEST IN FOODTECH IN SPAIN



Foodtech: A sector navigating the tides

In the year 2023, we have observed a decline in investments in food tech, mirroring the trends witnessed in the global venture capital markets. The global investment in agrifood for 2023 amounted to **€9.5B**, encompassing data from food products, agritech, food logistics and delivery, in-store retail and restaurant tech, kitchen and cooking tech. Notably, there has been a **61%** decrease from Q2 2022 to Q2 2023, with the investment figure dropping from **€5.4B** in Q2 2022 to **€2.1B** in Q2 2023, as reported by Dealroom in 2023¹⁴. This decline is potentially attributed to a slowdown in technological advancements and the implementation of regulations worldwide that have impacted the sector. A concurrent reduction in the number of transactions across all categories suggests a potential halving of operations.

The decline in investment, particularly noticeable since 2021, is partially attributed to the decline in investments for the plant-based sector. An in-depth analysis reveals a **47%** decline in investments for plant-based companies between 2021 and 2022, along with a **41%** decrease in operations during the same period. The average value per operation has been gradually decreasing since 2020 – a year marked by a surge in plant-based investments. Between 2022 to 2023 we observe a **66%** decline in investments for plant-based companies. This trend could be attributed to investors displaying a heightened interest in ingredients and advanced technologies that elevate plant-based experiences, prioritizing these aspects over the final product itself.

A parallel scenario is evident in other categories, such as cultivated meat. Startups operating in this domain have witnessed a downturn in investments since 2021, suggesting a period of deceleration as they anticipate scaling outcomes, favorable regulatory developments, and accelerated advancements in technology and capabilities.

Despite a downturn in investment in 2023 compared to the prior year, the sector continues to be appealing to national and international investors and entrepreneurs. Even in the current challenging climate, we are witnessing the maintenance of investment rounds. Within the global Foodtech ecosystem, it's particularly remarkable that **Spanish Foodtech startups have secured a total of €226M in 2023**¹⁵.

¹⁴Dealroom, <https://dealroom.co/>. Accessed January 2024

¹⁵The State of Foodtech in Spain (2023). Eatable Adventures: <https://eatableadventures.com/report-2023-eng/>

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INVEST IN FOODTECH IN SPAIN



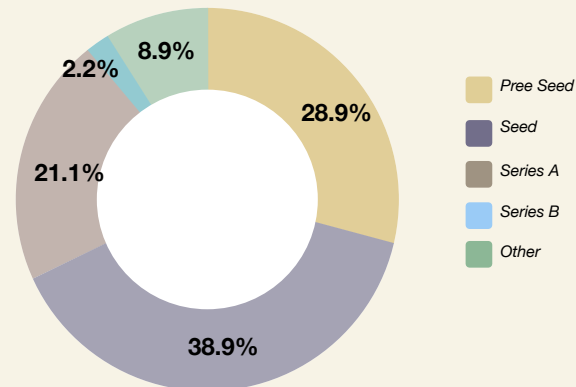
Investment Landscape: Stage and Size of Rounds

In the year 2023, startups in the seed stage continued to constitute the majority, accounting for approximately **38.9%**, reflecting a slight decrease compared to 2022. Conversely, the number of startups in Series A has declined to **21.1%**, despite the upward trajectory observed in 2021 and 2022¹⁶.

The total recorded investment stands at **€226M**, reflecting a 16% decrease from the previous year. This aligns with broader trends observed in international FoodTech investments, as reported by **Eatable Adventures** in 2023.

In terms of numbers, 2022's rounds that were sized **€750,000 to €1M** grew significantly, from **2.78%** in 2022 to **12.16%** during 2023; whilst smaller investment rounds varying from 0 to **€750,000** dropped in percentage from **74.08%** to **54.22%**.

It is also notable that the amount of startups who received investments of over **€1M** went from **19.44%** to **27.03%**.



ROUND SIZE	2022	2023
From 1€ to 350,000€	52.78%	39.19%
From 350,001€ to 500,000€	13.89%	10.81%
From 500,001€ to 750,000€	11.11%	10.81%
From 750,001€ to 1,000,000€	2.78%	12.16%
More than 1,000,000€	19.44%	27.03%

Source: Eatable Adventures, 2023

¹⁶The State of Foodtech in Spain (2023). Eatable Adventures: <https://eatableadventures.com/report-2023-eng/>

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INVEST IN FOODTECH IN SPAIN



Investment Landscape: Stage and Size of Rounds

The fast food home delivery chain [Vicio](#) has closed a **€20M** financing round, led by Iris Ventures and launching crowdfunding amongst its customers.

[Cocoon Bioscience](#) closed one of the largest funding round to date in March, raising **€15M**¹⁷ for the construction of a plant dedicated to the production of growth factors for cultivated meat and enzymes, in a round led by Cleon Capital as well as [Columbus Venture Partners](#) and North South Ventures. In November, the company successfully announced a new capital injection of **€2M**, led by [MONDRAGON](#) and [Bexen Medica](#).

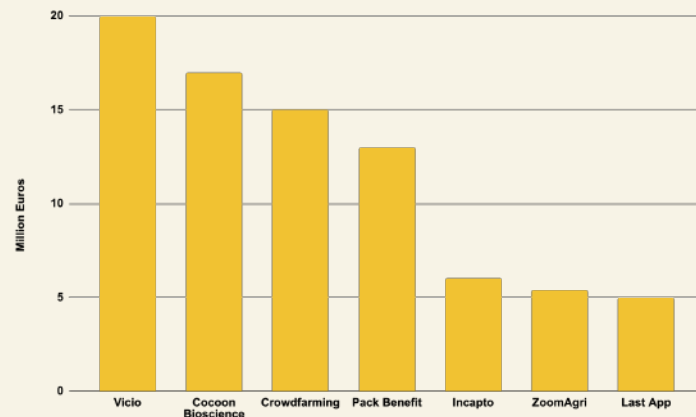
Meanwhile, [Incanto](#), a startup specializing in the coffee sector, has raised **€6M** to strengthen its international presence, with France, Italy, and Portugal as the first destinations in its expansion. This sum will also contribute to the expansion of its logistics center in Ripoll. The round was led by [P101](#), followed by current partners of the company, such as [JME Ventures](#), [Atresmedia](#), and the Portuguese fund [Bynd](#), with the addition of the Drago family's family office ([De Agostini group](#)).

[The European Investment Bank](#) (EIB) has signed a financing agreement, backed by the [InvestEU](#) program, worth **€15M** for [CrowdFarming](#), an online platform for direct sales between farmers and end consumers in Europe; and for **€13M** with [Pack Benefit](#), a company dedicated to the manufacturing of **100%** compostable food trays.

[ZoomAgri](#) raised **€5.42M** in a Series A funding round, led by [GrainCorp](#) and [GrainInnovate](#), with follow-on investments from [SP Ventures](#) and [Artesian](#), launching crowdfunding amongst its customers.

¹⁷ Dealroom, <https://dealroom.co/>, Accessed November 2023

2023 RANKING ROUND SIZE IN €



Source: prepared by the author

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INVEST IN FOODTECH IN SPAIN



Domestic Investment Overview: Exploring Major Investors by Number of Investments

Capsa Vida, the investment arm of the dairy company **Capsa Food**, has mobilized **€2.9M** in its initial phase of implementation. Specifically, it has allocated **€1.8M** for direct investment in high-impact innovative entrepreneurship projects. During 2023 it has invested in **Entomo Agroindustrial**, **Baia Food**, **Nucaps**, and **GrinGrin Foods**.

BeHappy Investments has contributed **€1M** – in co-investment with the **R-foodlution** vehicle of partner José Luis Nieto – to **HarBest Market**, a B2B marketplace that enables restaurants to purchase products directly from producers more competitively by eliminating intermediaries. Additionally, they have invested **€288,000** in the Riojan startup **Hunty**, a platform for searching, comparing, and booking the best hunting experiences, both nationally and internationally.

Eatable Adventures has invested in its **Spain Food Tech 2023** cohort, namely: **Bio2Coat**, which develops natural coatings that extend the shelf life of fruits and vegetables; **mmmico**, which combines techniques such as fermentation, directed evolution and artificial intelligence to develop new natural alternatives to synthetic flavorings and colorings in record time and cost; and **Néboda** which develops automation technology for vertical farming that enables high-density, low-cost cultivation systems.

It is notable to mention the newly launched **Yellow VC**, a **€30M** pre-seed fund that aims to invest at the earliest possible stage. It was established by **Glovo** founders Oscar Pierre and Sacha Michaud, along with Adam Lasri, previously an investor with VC powerhouse **Atomico**. Yellow is particularly focused on bolstering Southern Europe, with a special emphasis on major markets in the region like Spain, Italy, and Portugal.

INVESTOR	LOCATION	STARTUPS
	Barcelona	  
	Madrid	 
	Madrid	 
	Madrid	
	Valencia	 

Source: Eatable Adventures, 2023

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INVEST IN
FOODTECH
IN SPAIN

International Investment Overview: Exploring Major Investors by Number of Investments

Spanish startups continued to attract international interest during 2023. Accelerators, investment funds, and corporations have supported Spanish startups throughout the year.

Newtree, which has co-invested in **Heura** in its **€2.7M** round, already trusts in Spanish startups by also having Cubiq in its investment portfolio.

ProVeg Incubator, the plant-based and cellular agriculture incubator, has announced its eleventh promotion with eight new food technology companies, including two Spanish ones: **Poseidona**, whose algae protein aims to be "the new soy," and **Guimarana Dream Food**, which has developed a range of natural flavors in the form of seasoning blends, broths, and powdered broths.

On the other hand, **Bynd Venture Capital** from Portugal has led a **€5M** investment round for **Last.app**, a restaurant tech company that seeks to simplify restaurant management with its TPV Software, and integrates delivery orders, reservations, and online stores.

North South Ventures, a United States fund, has led **Cocoon Bioscience's** **€15M** investment round along with **Columbus Venture Partners** and **Cleon Capital**; meanwhile, the Spanish startup **Väcka** has managed to capture the attention of the **Big Idea Ventures fund**.

INVESTOR	LOCATION	STARTUPS
	Belgium	
	Germany	
	Portugal	
	USA	
	USA	

Source: Eatable Adventures, 2023

4

INVEST IN FOODTECH IN SPAIN



The opinion of domestic investors

Rubén Hidalgo González, Open Innovation Director at Capsa Vida



What is your perspective on the investment landscape in the foodtech sector in Spain?

The foodtech sector in Spain is reaching the midpoint of its journey. While just a few years ago, Spain faced the emergence of the sector, after the work done, we have reached the consolidation phase. Navigating this phase presents both opportunities and challenges. Challenges lie in finding a solid connection between project milestones and the investment theses of foodtech funds. On one hand, there is a good supply of projects with sufficient technological demonstration but lacking commercial viability. This creates a gap between current financial needs and what investors in rounds beyond the seed stage require. On the other hand, if we overcome this gap, there are ample opportunities. Spain is a country with a significant industrial presence that has become highly competitive globally, especially in the aftermath of the economic crisis. By aligning the foodtech sector with the capacity and international presence of our industry, opportunities will become too evident for investment offers not to decisively focus on it.



4

INVEST IN FOODTECH IN SPAIN



The opinion of domestic investors

José Luis Cabañero, Founder and CEO at Eatable Adventures

**EATABLE
ADVENTURES**

What is your perspective on the investment landscape in the foodtech sector in Spain?

It is noteworthy that despite the general trend of declining investments in Spain, the Foodtech sector has shown a lesser susceptibility to this downturn, demonstrating a remarkable tenacity compared to the overall investment landscape in the country. Parallel to this, the Agritech sector has shown an impressive growth, increasing its total investment from 32 to 93 million euros, which in addition to an increase in the number of startups focusing on water management and agricultural robotics, has propelled the technification of the agronomic system. This landscape indicates a clear emphasis on innovation, and an active search for new opportunities to grow and differentiate in the market, reflecting an increased entrepreneurial spirit that aims not just to keep up but to lead in a competitive environment.



4

INVEST IN FOODTECH IN SPAIN



The opinion of domestic investors

Nora Alonso, Fund Partner at Swanlaab



What is your perspective on the investment landscape in the foodtech sector in Spain?

Spain presents a promising investment landscape in the agro-food tech sector, bridging technological innovations with the traditional Spanish agronomic ecosystem. We observe a growing number of startups seamlessly integrating both sectors, and we see significant opportunities to drive transformation in the agri-food chain. Swanlaab is proud to contribute to this dynamic ecosystem, supporting initiatives that not only enhance operational efficiency but also promote environmental and economic sustainability in the Spanish agri-food industry.

4

INVEST IN FOODTECH IN SPAIN



The opinion of international investors

Alrecht Wolfmeyer, Head of Proveg Incubator



What is your perspective on the investment landscape in the foodtech sector in Spain?

My perspective on the investment landscape for the food tech sector in Spain is positive – in spite of the overall challenging development of the food tech and markets overall in Europe and globally. Spain is in a good position to offer new opportunities and keep innovating. There is a huge and growing pool of talent and startups as well as a powerful ecosystem of partners supporting them, from food producers, corporate investors to hubs like incubator and accelerator programmes. At the same time, Spain is one of the leading food and ag-tech markets in Europe and the world and as such also highly relevant for impact investments in these areas.



4

INVEST IN FOODTECH IN SPAIN



The opinion of international investors

Tomás Penaguão, Partner at bynd Venture Capital



What's your perspective on the investment landscape in foodtech sector in Spain?

Spain is one of the most developed food tech ecosystems in Europe with more than 400 companies in this space, rivaling countries with a higher density of startups in general. In Iberia, our culture of considering mealtimes a sacred moment to be enjoyed together, our taste for tasty and healthy ingredients based on our Mediterranean diet combined with the entrepreneurial fabric in this space and the talent and research coming from universities and specialized technology centers will allow this ecosystem to continue to thrive. At Bynd we have analyzed very interesting food tech companies in different verticals, from software for restaurants, alternative proteins, healthier and more sustainable ingredients or transparency and traceability in the food value chain, among others. At the moment we already have 3 investments in food tech: LastApp, Incapto and Rice and we want to continue pursuing opportunities in companies in this space.

4

INVEST IN FOODTECH IN SPAIN



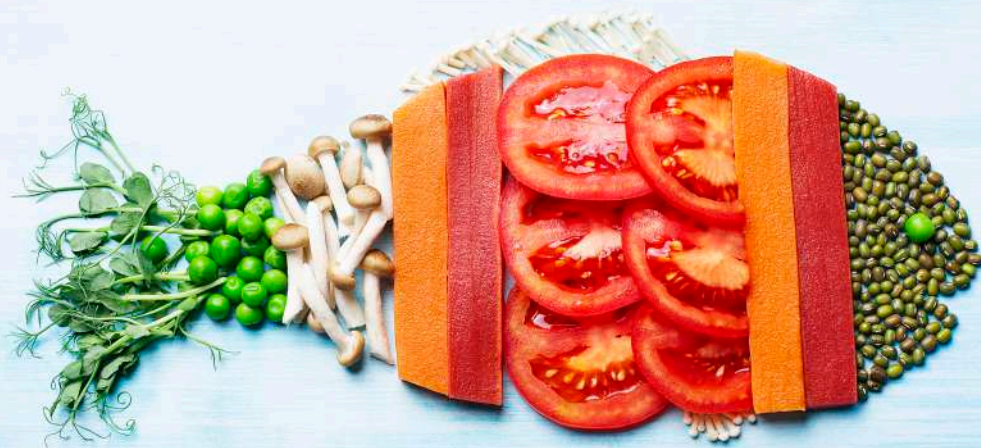
The opinion of international investors

Henrietta Hearth - Vice president of Big Idea Ventures



What is your perspective on the investment landscape in the foodtech sector in Spain?

We are excited about the Spanish food tech ecosystem, we've already invested in several Spanish startups that have achieved significant results in just a few years and our deal flow from Spain is getting stronger and stronger. The impacts of climate change are becoming more and more apparent, and Spain as the most important market in Europe for fruit and vegetables feels this this most and we are seeing Spanish entrepreneurs with real determination to solve the problems that they see every summer. Going forward we're looking forward to seeing Spanish foodtech companies expanding outside of Spain to solve global problems that are becoming more apparent every year.



5

SPAIN'S FOODTECH NATION

NATION

5

SPAIN FOODTECH NATION



Advancing Foodtech in Spain: Embracing Evolving Trends and Sustainable Innovations

The global acknowledgment of the Spanish FoodTech ecosystem is on the rise, solidifying **Spain's** position as a **key player in the sector**. The emergence of numerous projects underscores Spain's leadership in FoodTech, contributing to its growing international recognition.

Continuous research and development in the food industry contribute to disruptive innovations, paving the way for a more sustainable future. In the following sections, we will delve into some of the notable developments that occurred in various areas over the past year.

- Innovative Food Startups: Emerging Approaches in Alternative Proteins
- Exploring New Frontiers: Foundations for Introducing Novel Foods
- Collaboration: the Driver of Food Innovation
- Food Safety: the Core of New Startups
- Innovative Packaging: Enhancing Product Value & Sustainability
- Protein Evolution: Navigating the Evolving Landscape.



5

SPAIN FOODTECH NATION



Innovative Food Startups: Emerging Approaches in Alternative Proteins

Ensuring access to a varied spectrum of safe and nutritious food is imperative for sustaining life and promoting optimal health. Acknowledging the pivotal role of alternative proteins in the landscape of food innovation, they address critical requirements such as taste, affordability, convenience, sustainability, and health. The Spanish ecosystem stands as a frontrunner in championing this transformative movement.

Alongside technology, new startups and established companies are not only enriching the market offerings but also accelerating processes, enhancing taste, and improving texture in new food products. This innovation is playing a significant role in improving sustainability within the food industry as well, by promoting resource efficiency, reducing waste, and striving towards more environmentally friendly practices.

When it comes to large established companies, we observe how they are increasingly embracing this innovative trend of alternative proteins. For instance, [Incarlopsa](#) ventures into the production of next-generation proteins through recycling waste and by-products to create high-value foods, partnering with [Moa Foodtech](#) from Navarre, a technology firm that combines biotechnology and artificial intelligence to modernize, sustain, and enhance the efficiency of the agri-food industry. This agreement aims to develop and offer sustainable proteins through the fermentation of waste and by-products.

The Spanish supermarket chain [Eroski](#) has introduced its first **own-brand plant based range**, **EROSKI VEGGIE** that responds to the new demands and food preferences of the consumer.

Moreover, [Grupo AN](#) and [Sanygran](#) signed a project in protein concentrate extraction aiming to address an existing gap in the value chain of alternative protein in Spain, and also meet the demands of the Common Agricultural Policy (CAP) related to soil regeneration.

[Carrefour Spain](#) is launching **3D bio-printed plant based bacon**, a product developed by Spanish startups [Foodys](#) and [Cocuu](#), into all its stores at nearly the same price as conventional bacon. [Natur All](#), [Iparlat's plant based division](#), will introduce "**Natur All by Foodys**," featuring vegetable meat alternatives by [Foodys](#). These additions will expand their existing product portfolio to include a variety of plant based meat alternatives. The '**Natur All by Foodys**' line will be distributed in several countries, supporting **Foodys' international expansion** and enhancing production capacity for efficiency and scalability.

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SPAIN FOODTECH NATION



Exploring New Frontiers: Foundations for Introducing Novel Foods

Within the domain of introducing pioneering food products, the cornerstone lies in adeptly navigating regulations, securing necessary approvals, staying abreast of recent developments, and establishing pilot plants for the inception of new creations.

In Spain, the introduction of novel foods is regulated by the European Union legislation, which is transposed into the national legal framework. Novel foods are defined as those that were not commonly consumed in the EU before May 15, 1997. The European Commission Regulation (EU) 2015/2283 outlines the authorization process for novel foods.

Novel foods encompass innovative methods of food production. For instance, the startup [Cocoon Bioscience](#) has developed a technology that utilizes **live insects as natural bioreactors for producing specialized enzymes**, such as RNA synthesis, genetic sequencing, and high-performance growth factors for the cultivated meat industry, a trending topic which will be rising in the near future years. This approach achieves a level of functionality and low cost that no other protein expression platform can match.

[ODS Protein](#), a Galician startup, specializes in **producing alternative proteins** through the fermentation of filamentous fungi for the food industry. Their novel, climate-independent production system revalues food industry by-products and waste, yielding ingredients with outstanding nutritional and functional value.

The Basque technology company [Cultzyme](#) specializes in producing **smart bioreactors** for the food, pharmaceutical, and biomaterials sectors. These devices enable precise control in food production through cell culture or precision fermentation, addressing the crucial technologies required for today's demand in novel food production.



Credits Cultzyme

5

SPAIN FOODTECH NATION



Exploring New Frontiers: Foundations for Introducing Novel Foods

With the increasing introduction of novel foods into the market, there is a growing need for expanded **infrastructure** to accommodate the production necessary to meet the rising demands.

BioTech Foods has started the construction of its **cultivated meat production plant** in San Sebastian, supported by the Brazilian meat company **JBS**, with a budget of **€38M**. The facility holds a potential annual production capacity of **1,000 tons**, with the possibility of expanding to **4,000 tons** per year in the medium term. This marks the largest laboratory-produced meat facility in the world to date.

Also, **Elian Barcelona**, an agro-industrial company belonging to **Viserion International**, has signed an agreement to **acquire** the **Cargill plant** located in the Port of Barcelona. This plant is dedicated to the processing of soybeans, a process based on the extraction of flour and oil from this oilseed.

Ingredalia, upcycling and revaluing the vegetable by-products, has announced its new project to establish its **first production plant for alternative ingredients and proteins**, with an investment of up to **€3M**.

Tebrio, the Spanish-based and world's largest company in the production and processing of the Tenebrio molitor insect, is constructing a **factory spanning 80,000 square meters** in Salamanca. This endeavor is made possible by an **€80M** investment, aiming to bring **100,000** tons of their products to the market each year.

Furthermore, **Bread Free** is planning to open the **world's first gluten-free wheat flour factory**, which will enable them to generate batches of their products on a larger scale, validating the market locally and continuing to develop technology that can be applied to other cereals that naturally contain gluten, such as barley and rye.

Recently, **Sanygran** strategically expanded by acquiring **Obrador Sorribas** from **Group Idilia Foods**, securing the largest industrial capacity in southern Europe for plant-based food production.

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SPAIN FOODTECH NATION



Collaboration: The Driver of Food Innovation

Synergies among nascent enterprises in the food industry drive revolutionary innovations, marked by the introduction of **novel products**. These offerings provide a diverse and sustainable array of options, adeptly meeting the dynamic demands of consumers.

In this regard, [Foodys](#) and [Cocuus](#), Navarre-based companies specialized in the development, industrialization, and commercialization of vegetable products derived from **3D bio-printing**, have created the **world's first plant-based tripe**.

[Realfooding](#), the clean-based food startup and [La Newyorkina](#), an Asturian company specialized in the production of granola, have **introduced a new granola with orange zest and dates, made without refined sugars or added sweeteners**, as well as without oils or refined flours, allowing both brands to compete in this category with a completely innovative proposition and leveraging the increasing consumers demand for healthy and clean food products in the market.

Researchers from IG-CSIC, part of CSIC, along with [Oleica](#) and [La Salmoreteca](#), introduced **'BeWellDrinks.'** a new line of probiotic plant-based beverages. Made mainly with water, fruits, and vegetables, these drinks include high-biological-value components like antioxidants, fiber, vitamins, and minerals, with concentrations varying based on the vegetable type.

The Madrid-based startup [Relash](#), in collaboration with [Mahou San Miguel](#), has introduced its **first range of organic soft drinks to the market**. These beverages are crafted with **adaptogens and functional ingredients** such as ginseng, melissa, and green tea, providing a stable and natural source of energy. The launch of this new product line aligns with the kick-off of 'New Drinks,' a fresh initiative spearheaded by [Mahou San Miguel](#) and its innovation platform **'BarLab Ventures.'**

In a collaborative effort to reshape the soft drink industry, [Pepe Mate](#) and [Brava Kombucha](#), two emerging Spanish brands with a shared emphasis on quality and local identity, have decided to join forces to introduce **a novel variant of Kombucha**. This variant is naturally fermented from yerba mate instead of the traditional tea, combining the inherent energizing properties of yerba mate with the natural probiotic benefits found in kombucha.



Credits: Foodys



Credits: Relash

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SPAIN FOODTECH NATION



Food Safety: the Core of New Startups

Having access to enough safe and healthy food is crucial for sustaining life and promoting good health. In Spain, where the food production sector significantly contributes to the economy, ensuring the safety of **food is a critical concern**. Spanish agricultural products are renowned for their quality and stand as one of Europe's major producers.

Globally, advancements in technology are **driving increased efficiency and improved safety standards** in food service businesses. Spain remains at the forefront of these developments. These technological advancements not only enhance food safety but also have the potential to save the industry significant time and money.

The integration of new technologies, such as **blockchain, traceability, sensing, and artificial intelligence**, in Spain's food industry has seen notable growth with disruptive startups in the stage.

For instance, [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.

Also, [AOTECH](#), a Bilbao-based company, has developed a platform for the on-line 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.

Several startups are achieving greater transparency in the supply chain through blockchain. Highlighting [Mercatrace](#), a platform that offers traceability through blockchain of products from their origin, handling and transportation, to the consumer's hands.

Also, [Trazable](#) guarantees the **quality and food safety of products**, reducing errors in the production chain, saving time, and boosting confidence of consumers. Furthermore, [Nutrasing](#) focuses on obtaining **real transparency in the agritech sector**. With **Food Track™**, their blockchain technology-backed platform enables the creation of a unique, secure and immutable digital record of each product to provide source-to-table traceability.



Credits: Mercatrace



Innovative Packaging: Enhancing Product Value & Sustainability

The role of packaging extends far beyond its traditional function of preserving and containing products. Innovative packaging solutions have become a driving force in enhancing the value of products across various industries. The evolution of packaging strategies now integrates advanced technologies, sustainable materials, and creative design elements to not only protect but also elevate the perceived value of the products they involve in different areas.

Reducing plastic packaging is a significant focus in today's industry. Startups and large companies alike are taking steps to minimize plastic use due to strict EU regulations, prompting increased innovation and research in this field.

For example, [AINIA](#) has undertaken an innovative project in the field of plastics recycling. The **REVALORIZA** project, financed by [IVACE](#) and [FEDER funds](#), investigates new technologies to reduce costs and optimize the production of biodegradable plastic recycling.

[Feltwood](#), in collaboration with [FITA](#) (Foundation for Innovation and Agri-Food Transfer in Aragon) and with funding from the Government of Aragon, is analyzing and achieving positive results in the shelf life of various vegetables using their eco-friendly and compostable Feltwood **trays made from broccoli and cereal waste**, providing an **alternative to conventional plastic**.

[Beyond Seeds](#) has spent five years researching over 50 plant species, primarily focusing on seeds. Finally, they have developed a commercially significant bioplastic using a polymer formulation based on the acetylation of red algae agar and plant extracts from seeds.



Credits: Feltwood



Credits: Beyond Seeds

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SPAIN FOODTECH NATION



Innovative Packaging: Enhancing Product Value & Sustainability

Gloop, a Spanish Foodtech company dedicated to combating the issue of single-use plastic waste through its innovative and sustainable solution of **edible cutlery**, made from rice fiber, starch, oil, and sugar, has successfully concluded an investment round, securing a total of **€540,000**.

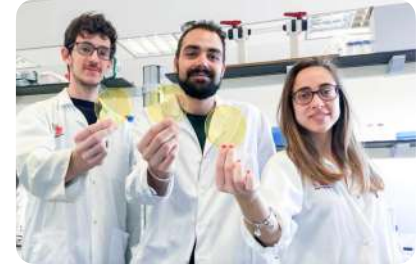
Apart from reducing plastic waste in the packaging industry, integrating innovative strategies such as advanced technologies is prompting the industry to the next level. For instance, advanced sensors integrated into food packaging provide real-time data on freshness and history, reducing waste and enhancing food safety—a concept known as **'smart packaging'**.

In Spain, startups like **Color Sensing** and **Oscillum** are at the forefront of this innovation. **Color Sensing's FoodSensing** line employs a patented QR-based color pattern system to quantify freshness, while **Oscillum's** patented technology of smart labels utilizes color changes as a means to indicate food spoilage, aiming to reduce waste and enhance transparency within the value chain.

This system is specifically engineered to efficiently detect and promptly alert concerning the state of decomposition of a food product, while also providing insights into its manufacturing process. Also, they fabricate flour packages that prevent the appearance of insects.

In addition to **smart packaging**, there are active packaging systems that protect food from contamination or degradation by sealing the package or controlling its atmosphere.

For instance, a Barcelona-based startup, **Bio2Coat**, has developed an edible coating made of **100%** natural ingredients that extend the shelf life of perishable foods like fruits and vegetables by creating a semi-permeable barrier that controls respiration rate and reduces the loss of mass in food.



Credits: Oscillum



Credits: Bio2Coat

5

SPAIN FOODTECH NATION



Protein Revolution: Navigating the Evolving Landscape

In the realm of food technology, the emphasis extends beyond the introduction of new proteins to a **dedicated focus on enhancing traditional protein sources**. This exploration of advances in traditional proteins reflects a commitment to **refining existing elements** within this field, with a keen awareness of the importance of ensuring and advancing food safety standards. Moreover, it seeks to foster **sustainability** by addressing concerns related to **overproduction** and **waste**, aiming to strike a balance that sustains traditions while minimizing environmental impact.

For instance, the value chain of the **fishing sector** needs the integration of innovation and technology to achieve maximum efficiency and transparency, with the overarching goal of ensuring food safety and sustaining livelihoods. Despite a decrease in the volume of overfishing, **28%**¹⁸ of fish populations are still overexploited. The development of new production models, improvements in aquaculture techniques, and the advancement of aquaponics systems—combining fish farming with plant cultivation—present opportunities to address this challenge.

In this matter, to address seafood overproduction, **Guimarana Dream Food, now rebranded as “Gimme Sabor”**, introduces a novel approach to **instant flavors**, providing healthy and sustainable options free of allergens and GMOs, recreating classic tastes like fish and meat with plant-based ingredients.

Similarly, **Seavolution** presents a **real plant based solution**, tackling issues of overfishing, plastic waste, and water pollution to contribute to ocean conservation and public health.

Also, **Zyrcular Foods** leads veggie protein innovations, utilizing proprietary technology to develop and distribute **plant based alternatives in fish**, and ready meals, marking a significant stride in the plant-based evolution within the agrifood industry.



Credits: Zyrcular



Credits: Gimme Sabor

¹⁸ La acuicultura en España 2023. https://apromar.es/wp-content/uploads/2023/09/La_acuicultura_Espana_2023_APROMAR.pdf

5

SPAIN FOODTECH NATION



Protein Revolution: Navigating the Evolving Landscape

To address food waste and enhance utility in transportation, **Sumbox**, an initiative by [Hinojosa Packaging Group](#), is highlighted as a 100% recyclable, sealed, and waterproof solution, serving as an alternative to Porex packaging, significantly minimizing polluting materials. specializes in **circular and sustainable packaging for the fish and seafood industry**. They craft water-resistant, insulating cardboard boxes that meet air transport standards, significantly minimizing polluting materials.

In another matter related to Spain's food safety in the livestock sector, [RFEAGAS](#), the **Royal Spanish Federation of Livestock Purebred Associations**, is dedicated to representing, protecting, and preserving the native breeds of Spanish livestock and their respective Breeder Associations, both nationally and internationally. It collaborates closely with government agencies, particularly in matters related to genetics, animal selection, pedigree books, health, and livestock research, among others, as well as in rural development.

Within the federation, some projects organized by operational groups are established with the aim of genetically improving certain breeds. This refers to the selection of a specific set of traits, typically including productivity under expected future environmental conditions. However, parameters such as fertility, disease resistance, or longevity must also be taken into account. Genetic improvement is a fundamental pillar for the development of livestock farming. It is crucial for efforts aimed at increasing production and for the adaptation of livestock populations to challenges such as climate change, emerging diseases, and pressures on food resources and water sources.



Credits RFEAGAS

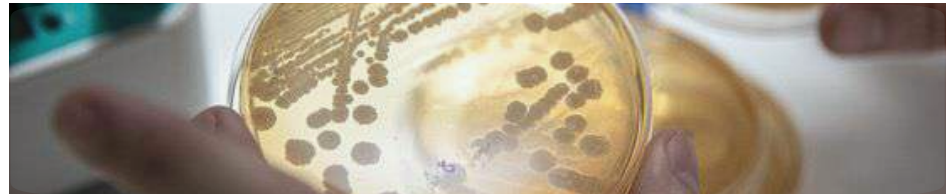


6

ARTIFICIAL INTELLIGENCE ALONGSIDE THE VALUE CHAIN



6

ARTIFICIAL
INTELLIGENCE
ALONGSIDE THE
VALUE CHAIN

AI's Role Throughout the Agrifood Value Chain: Applications from Farm to Fork

Artificial Intelligence (AI) encompasses the ability of machines to perform **cognitive functions** traditionally associated with human minds, such as reasoning, learning, planning, and creativity. By enabling technical systems to perceive, interpret, and respond to their surroundings, AI addresses challenges and pursues specific objectives. Through the analysis of past actions, AI systems can autonomously adapt their behavior.

It's important to note that AI leverages various technologies for its operation, including **machine learning**, which allows computers to learn from data and improve performance over time. **Deep learning**, a subset of machine learning, processes a diverse range of data sources. Additionally, **natural language processing** enables computers to understand, interpret, and process human language, while **computer vision** involves training computers to comprehend the visual world.

In light of this, **AI is reshaping the agri-food sector** by revolutionizing the processes involved in **food production, distribution, and consumption**. With AI, farmers can make informed, data-driven decisions to **optimize crop management**, increasing yields while minimizing resource wastage. AI-powered systems are pivotal in ensuring **food safety** by accurately detecting defects and contaminants in food products.

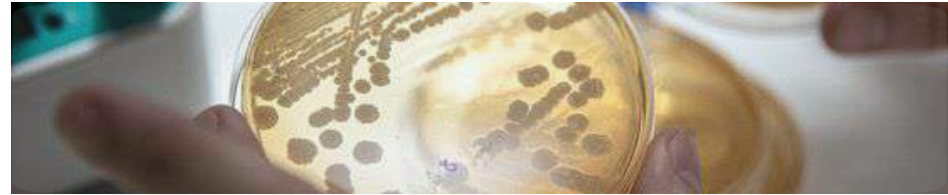
In **food processing**, AI facilitates both **automation and optimization**, overseeing and fine-tuning parameters to ensure consistent quality and minimize errors. AI algorithms further enhance **distribution processes** by forecasting demand, efficiently managing inventory, and optimizing delivery routes. Moreover, AI is at the forefront of a transformation in **personalized nutrition**, generating customized diet plans and recommending suitable food choices based on individuals' health data.



Credits: ICEX

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ARTIFICIAL INTELLIGENCE ALONGSIDE THE VALUE CHAIN



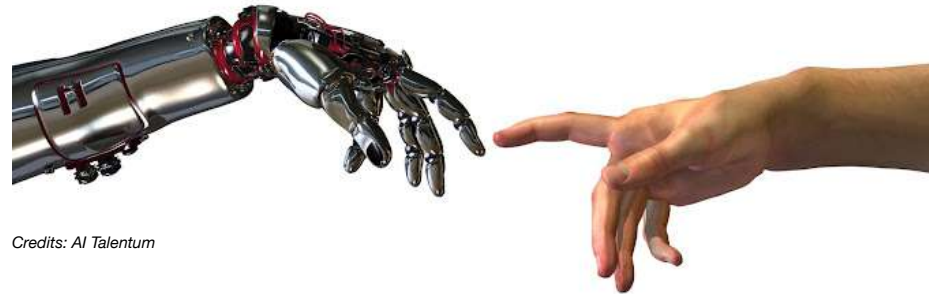
AI's Role: Revolutionizing Agriculture

AI is leading a revolution in modern agriculture, bringing about a transformation that spans from cultivation to food delivery. By leveraging data-driven decision-making and adopting precision agriculture, AI optimizes crop management, offering insights that cover everything from weather predictions to soil analysis. This not only boosts productivity but also encourages **more efficient and sustainable farming practices**.

Take, for example, [AgroPestAlert](#), an automated pest surveillance system supported by cloud-based analytic data applications, specifically tailored for the agricultural sector.

Also, [Agrow Analytics](#) acts as a facilitator for precision irrigation by providing data-driven recommendations. Operating as an Innovation and Development laboratory under **Iotic Solutions**, [Artificial Intelligence Talentum](#) contributes to advancements across various sectors.

Lastly, [Smart agrilabs](#) is a machine learning-powered and big data-driven company with the mission to **increase the profitability of small farmers globally**. Their innovative approach leverages the capabilities of AI to empower farmers and enhance the efficiency and sustainability of agricultural practices on a global scale.



Credits: AI Talentum

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ARTIFICIAL
INTELLIGENCE
ALONGSIDE THE
VALUE CHAIN

Powered Innovations: Harmonizing Taste and Tech

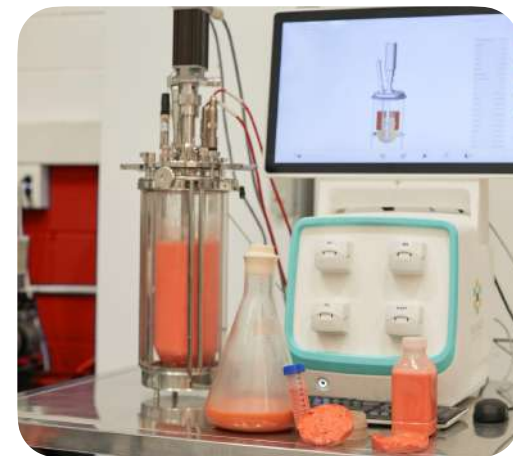
AI is revolutionizing the way formulations are crafted by leveraging advanced algorithms and machine learning. Through the analysis of datasets encompassing ingredient properties, nutritional information, market trends, and consumer preferences, AI systems can uncover new patterns and correlations, leading to the creation of innovative food products. This data-driven approach empowers food scientists and technologists to develop formulations that not only meet nutritional standards but also align with evolving consumer demands.

In this matter, [Mmmico eats](#) is a Spanish biotech company that seeks to end artificial additives in the food industry by developing **flavorings and colorings obtained through fermentation and AI**.

[MOA Foodtech](#), a Spanish food-tech company, is using AI combined with biotechnology to transform waste and by-products of the agri-food industry into a **"next-generation protein"**. Thanks to AI and its fermentation process, **MOA Foodtech** transforms these residue microorganisms into a state-of-the-art high-value protein ingredient.

The Basque technology company [Cultzyme](#) specializes in manufacturing **intelligent bioreactors** designed for the food, pharmaceutical, and biomaterial sectors. These advanced devices enable the production of precisely controlled foods through methods such as cell culture or precision fermentation. Its mission is to empower businesses by providing essential tools, data, and knowledge, enabling the attainment of unique and replicable results at the touch of a button, significantly facilitating scalability.

[Honey AI](#), the first intelligent microscope for **automated honey quality analysis**, delivers rapid on-site assessments in the apiculture sector. This cost-effective solution ensures rapid, autonomous, and precise quality control, offering businesses unparalleled efficiency in honey analysis.



Credits: Mmmico Eats

6

ARTIFICIAL INTELLIGENCE ALONGSIDE THE VALUE CHAIN



Smart Solutions: Optimizing Production and Transportation

AI's impact on production is extensive and transformative. Beyond automation tasks, AI enhances precision and quality assurance by analyzing real-time data, ensuring a consistent standard in taste, texture, and nutritional content. Furthermore, AI optimizes resource allocation by analyzing demand patterns, providing accurate forecasts, and enabling better planning to prevent overstock or shortages, enhancing the efficiency of goods flow through the transportation network.

In terms of security and traceability during transportation, AI employs advanced monitoring systems, including IoT sensors, enabling real-time tracking and ensuring compliance with safety standards.

In this aspect, [Gradhoc](#) is dedicating its work to **improve energy efficiency of companies**, ensuring food safety, and implementing predictive maintenance of the equipment, thanks to their adaptive software they integrate IoT, digital twin, and artificial intelligence technologies.

[Qualityc](#) designs and develops **software/hardware** to help the food industry **monitor the status of its products** throughout the entire production process in real-time, using data and AI training.

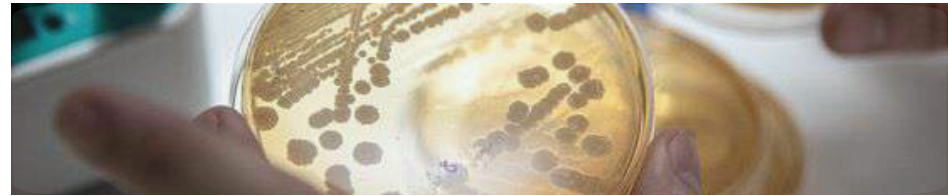
[Foodizon](#), a Barcelona-based startup, is an artificial intelligence platform for **food waste prevention in the foodservice industry**. It predicts the future demand for each menu item by analyzing historical data and key influencing factors. The accuracy of forecasts improves as the machine learning algorithms of AI Foodizon accumulate more data from the key influencing factors.

[Wetechfood](#) is a kitchen robot that improves KPIs monitoring and makes it possible to experience a remarkable improvement by reducing waiting time in the kitchen and eliminating human-related costs.



Credits: Wetechfood

6

**ARTIFICIAL
INTELLIGENCE
ALONGSIDE THE
VALUE CHAIN**

Transforming Agrifood Retail: Elevating Experiences with AI

Customization plays a pivotal role in AI's application in agrifood retail. Through the analysis of customer preferences, shopping habits, and demographic data, AI empowers retailers to deliver personalized recommendations and promotions. This not only elevates customer satisfaction but also cultivates brand loyalty. The in-store landscape is undergoing a significant transformation thanks to AI-driven solutions as well, incorporating innovations like smart shelves and cashierless checkout systems. These technologies optimize the shopping journey, minimizing wait times and delivering a seamlessly integrated retail experience enhanced by technology.

For example, **Gastro4U** is an exclusive **gastronomic app** that delivers **personalized recommendations** to people's next favorite restaurant based on user ratings and utilizes an AI algorithm to guide them to their next dining experience.

GrabIt uses **computer vision solutions** for retail, enhancing the capabilities of various equipment (such as refrigerators, warehouses, counters, scales, palletizers, shelves, conveyors, etc.) by providing autonomous vision to recognize relevant situations that may affect the food quality of the food products.

Proppos efficiently utilizes AI, particularly in **food recognition** using edge AI, providing rapid product identification without connectivity delays. Their cutting-edge technology focuses on AI **checkout solutions for Foodservice and Retail industries**, including grab-and-go stores, self-service restaurants, and bakeries, aiming to revolutionize the checkout experience with accurate, autonomous, and cost-effective computer vision solutions.

Bronze Vision strategically incorporates AI and computer vision into restaurant operations, fostering improved service and efficiency. By mitigating human errors in production and packaging, the technology streamlines processes, enhancing overall time management. This not only ensures a higher standard of product quality, contributing to customer satisfaction but also facilitates increased sales and rapid business scalability.



Credits: Proppos

Foodtech in Spain

Fostering Collaboration for Sustainable
Agri-Food Excellence

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