gfi Europe

Country deep dive:

Spain

State of the European alternative protein research and innovation ecosystem

Dr David Hunt and Dr Stella Child

Alternative protein research in Spain

Rounding out the top 10 countries by funding, Spanish investment has dropped off in the past two years.

Academic research output has grown significantly in recent years, driven in large part by the prominent role played by Spanish institutions in European Commission-funded research, but Spain lags behind its neighbours in translating science into patent filings.

Credit: Chris Molloy

What do we mean by alternative protein pillars?

The fields of research that are the focus of this report are split into three main 'pillars', described below. In some instances, research projects combine techniques from across these disciplines. These are referred to as 'cross-cutting' throughout the report.

Plant-based

Produced directly from plants but look, taste, and cook like conventional animal products. For the purposes of this report, traditional fermentation techniques that use yeast or other microorganisms to modify the flavour, texture, or other characteristics of plant proteins will be considered within the plant-based pillar.

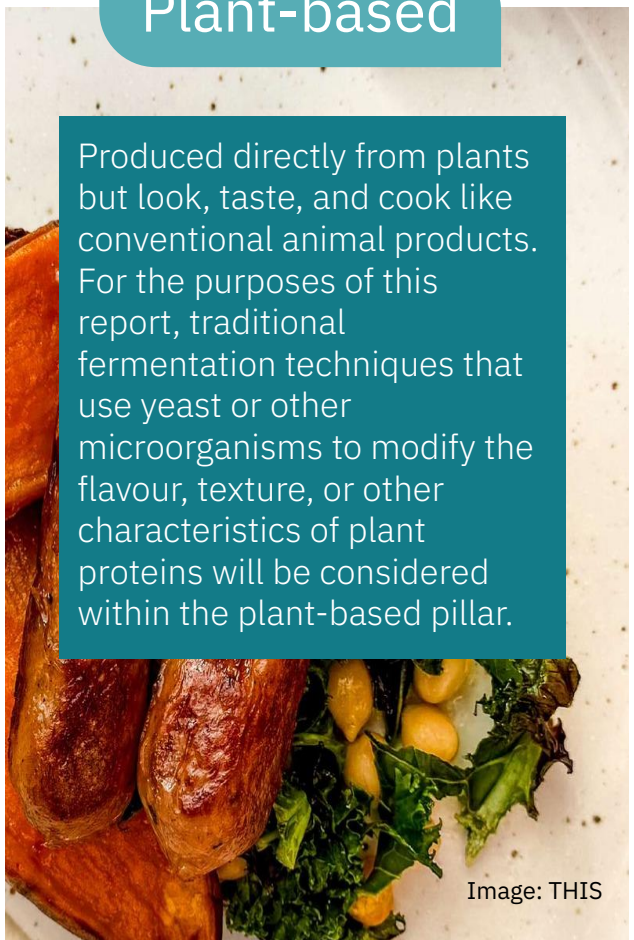


Image: THIS

Fermentation

Used in two primary ways: ***Biomass fermentation*** leverages the fast growth and high protein content of microorganisms to produce large quantities of protein. ***Precision fermentation*** uses microbes to produce specific functional ingredients important for the manufacture of alternative protein end products.

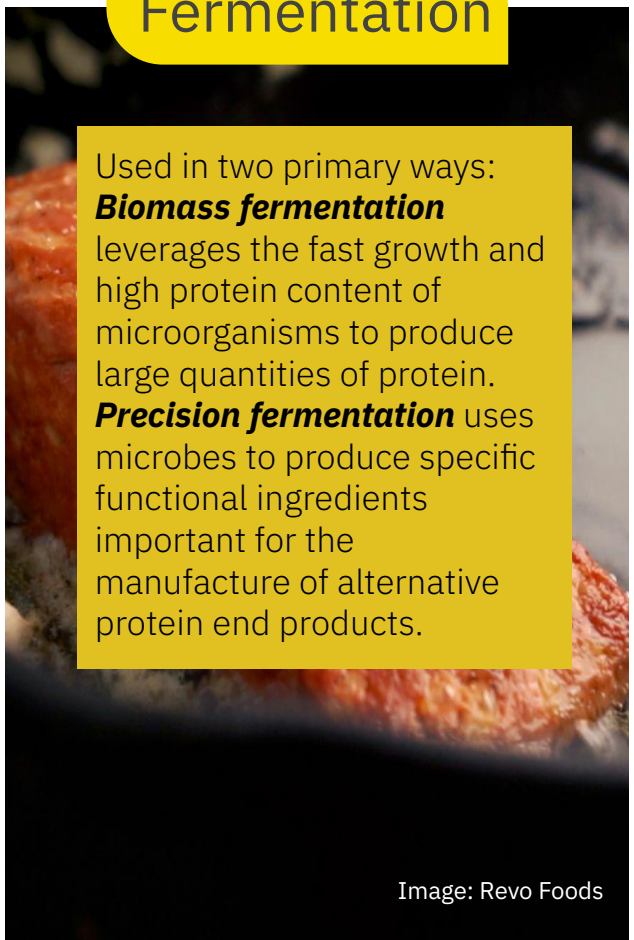


Image: Revo Foods

Cultivated

Foods like chicken, pork, beef, and fish that are produced by cultivating animal cells directly, thus replicating the sensory and nutritional profiles of conventional meat and seafood.

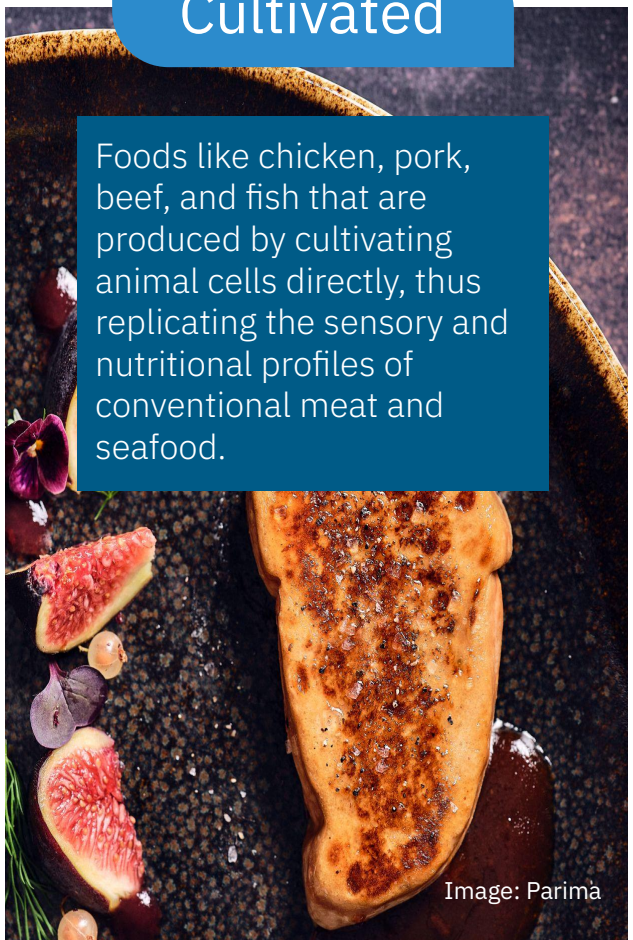
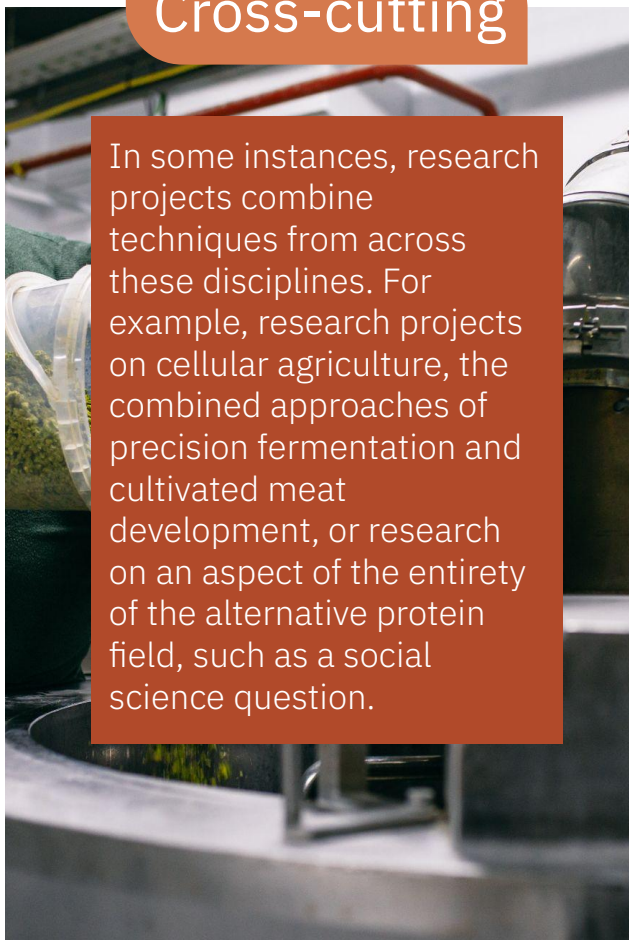


Image: Parima

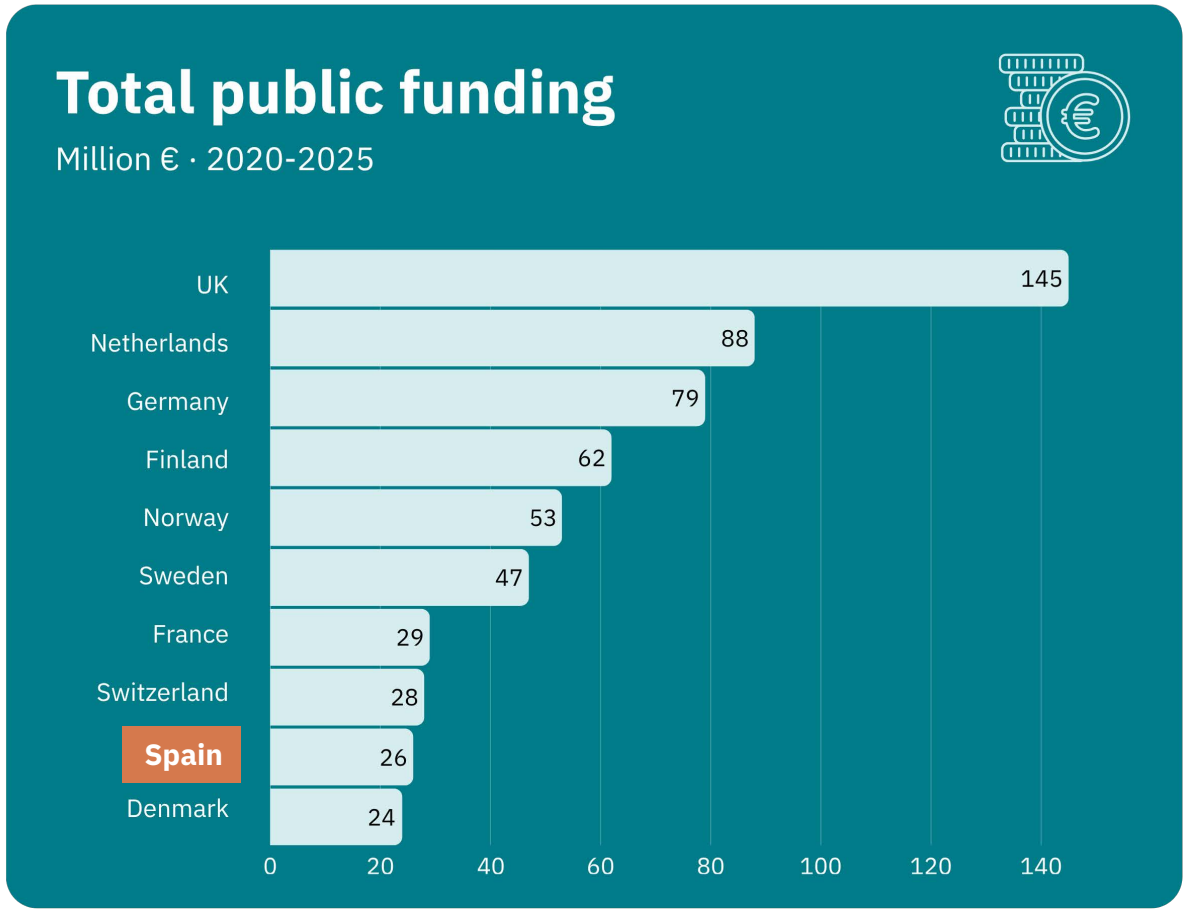
Cross-cutting

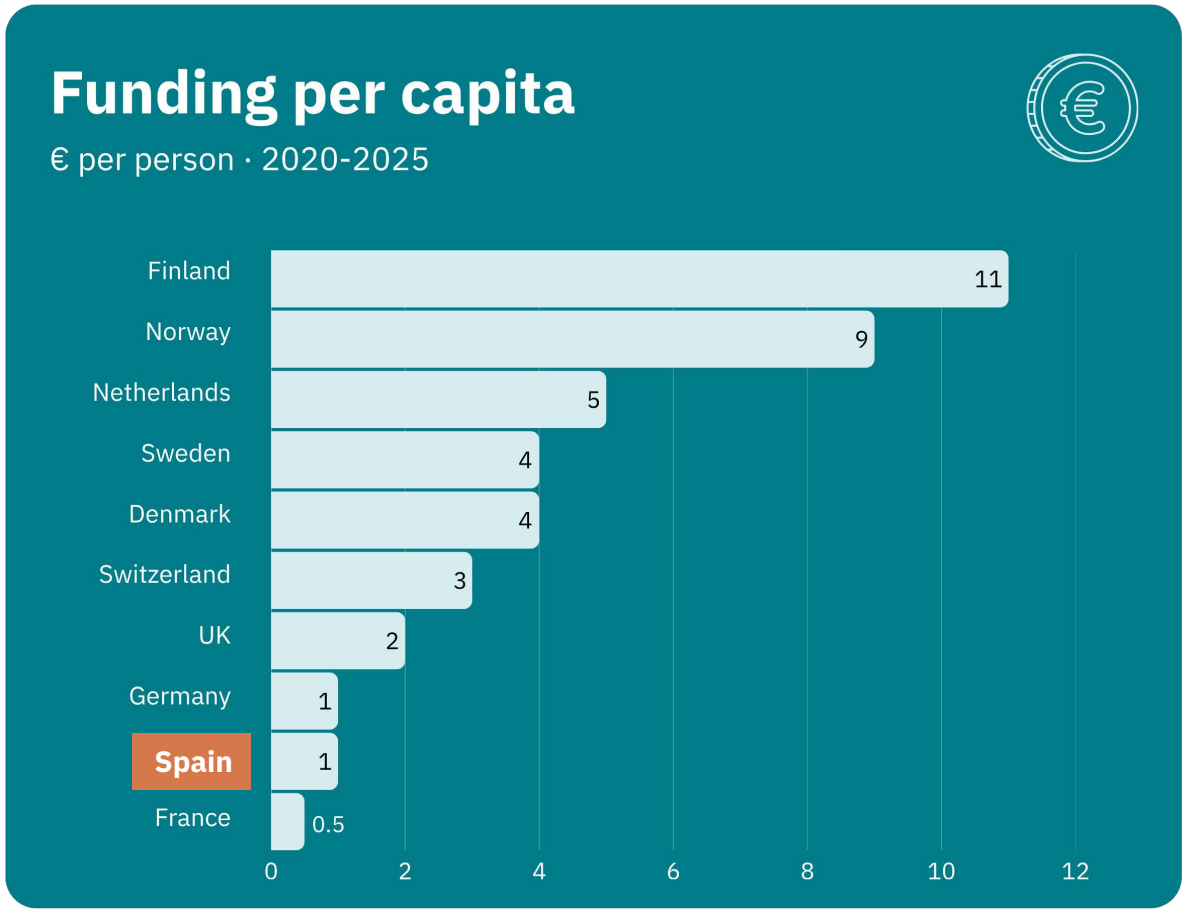
In some instances, research projects combine techniques from across these disciplines. For example, research projects on cellular agriculture, the combined approaches of precision fermentation and cultivated meat development, or research on an aspect of the entirety of the alternative protein field, such as a social science question.



Spanish funding compared to governments across Europe

Investment from the top 10 governments funding alternative proteins in Europe, 2020-2025, showing total public funding* (excluding nonprofit contributions) and public funding per capita.**
Spain ranks ninth in total funding, and 12th on a per capita basis.

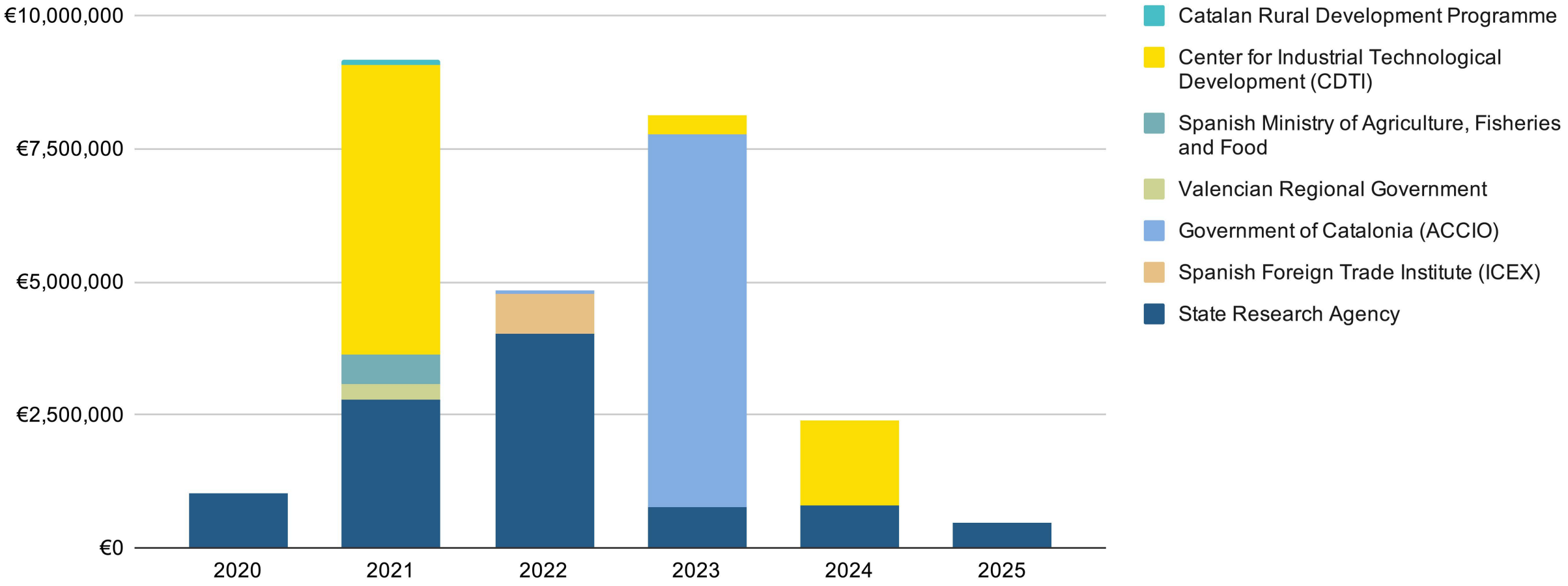




*Funding for some countries, such as the Netherlands, France, and Belgium, is likely an underestimate. **Per capita spending is only shown for the top 10 countries by total public research funding. Note that this is not a ranking of the top 10 by per capita spending, and that some countries in the top 10 by per capita spending are not displayed.

Spanish funding landscape

Investment in Spain, by research funder, 2020-2025.
Funding in Spain has been driven by a variety of funders, including regional governments, with the State Research Agency the most consistent.

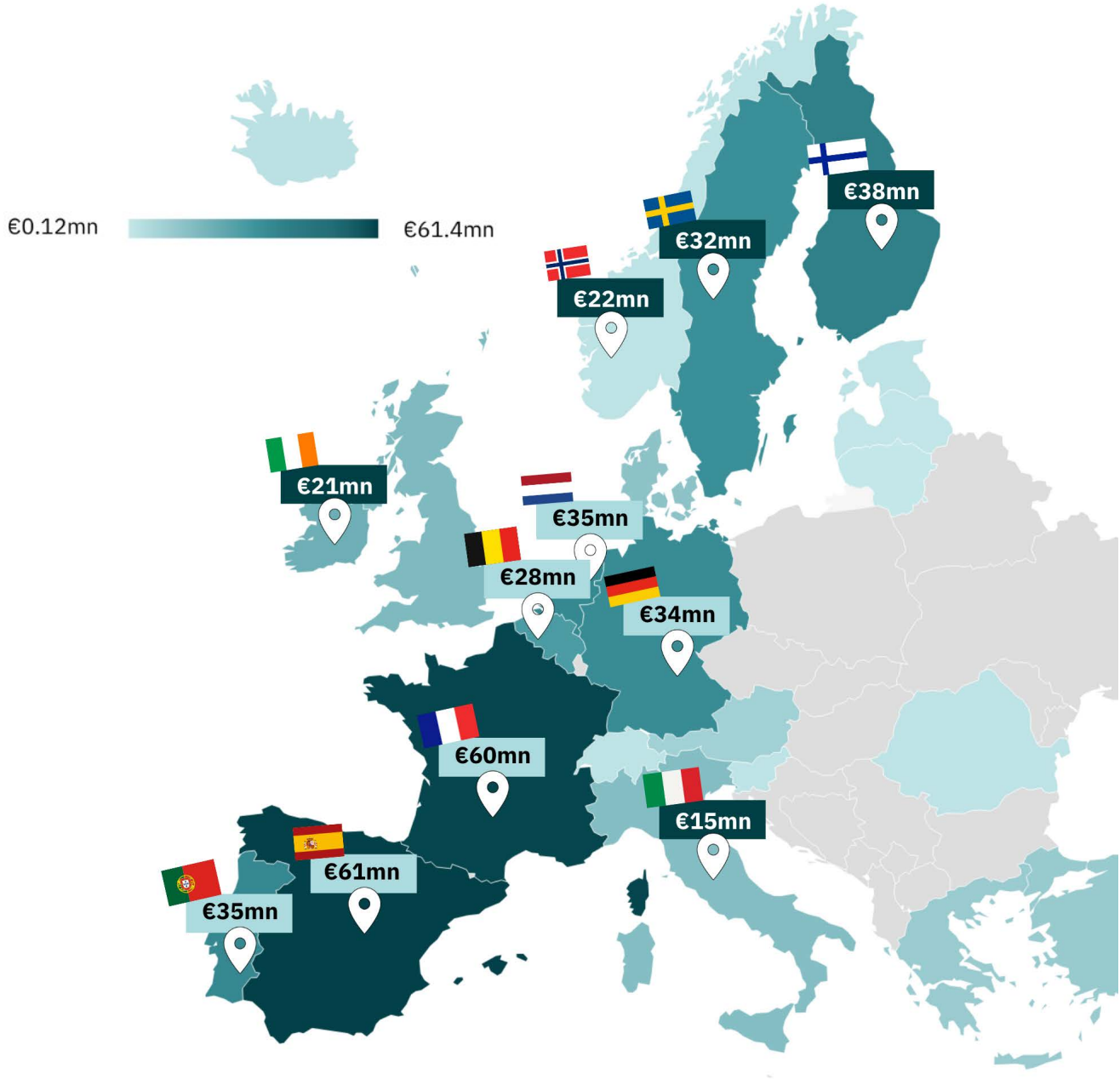


European funding recipients by country

This chart shows European funding allocated by location of the primary recipient, between the years 2020 and 2025.

Spain has been the leading recipient of European funds, ahead of France, Germany and Nordic countries such as Finland and Sweden. Spanish researchers led projects with a combined value of over €60 million.

The EU has driven a lot of the growth in funding across Europe, with cumulative funding in the past six years above €460 million.



Map created with datawrapper

Publications: overall trends

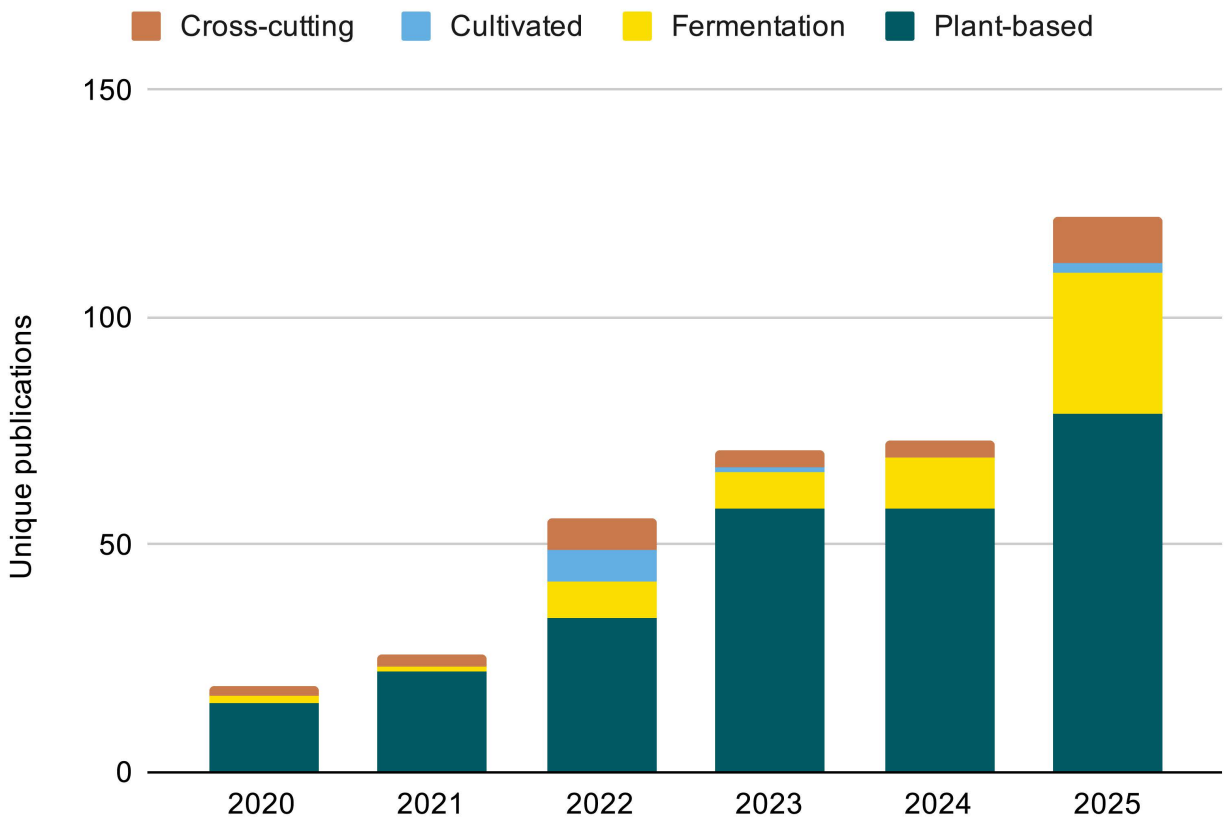
This chart shows the overall trends in academic publications in peer-reviewed journals on topics related to alternative proteins in the period 2020-2025.

Spain contributed to 367 publications on topics related to alternative proteins in the period 2020-2025 and ranked sixth overall in Europe.

Publication outputs grew by 50% per year on average but fluctuated over time. There were 122 research publications in 2025 compared with 19 in 2020 – a 542% increase – the strongest growth in Europe.

Breakdown of publications by alternative protein pillar:

- 72% plant-based proteins
- 17% fermentation-made proteins and ingredients
- 3% cultivated meat and seafood
- 8% cross-cutting topics



Leading research-performing organisations

This map shows the leading institutions for alternative protein research in Spain on the basis of unique publications in the period 2020-2025.

10 of the top 100 most-productive European research-performing organisations in alternative proteins are in Spain – placing it joint second with Germany and behind only the UK.

The leading Spanish organisation is the University of Vigo which ranked 22nd for total publications in 2025 and 31st overall for the period 2020-2025.

Spain performed strongly on both plant-based and fermentation publications over this period, ranking in fourth place for both. It is less competitive in cultivated meat and seafood, coming in at 12th.

Map made using Datawrapper. For a breakdown of the methodology used in this analysis, see the appendix

Patents: overall trends

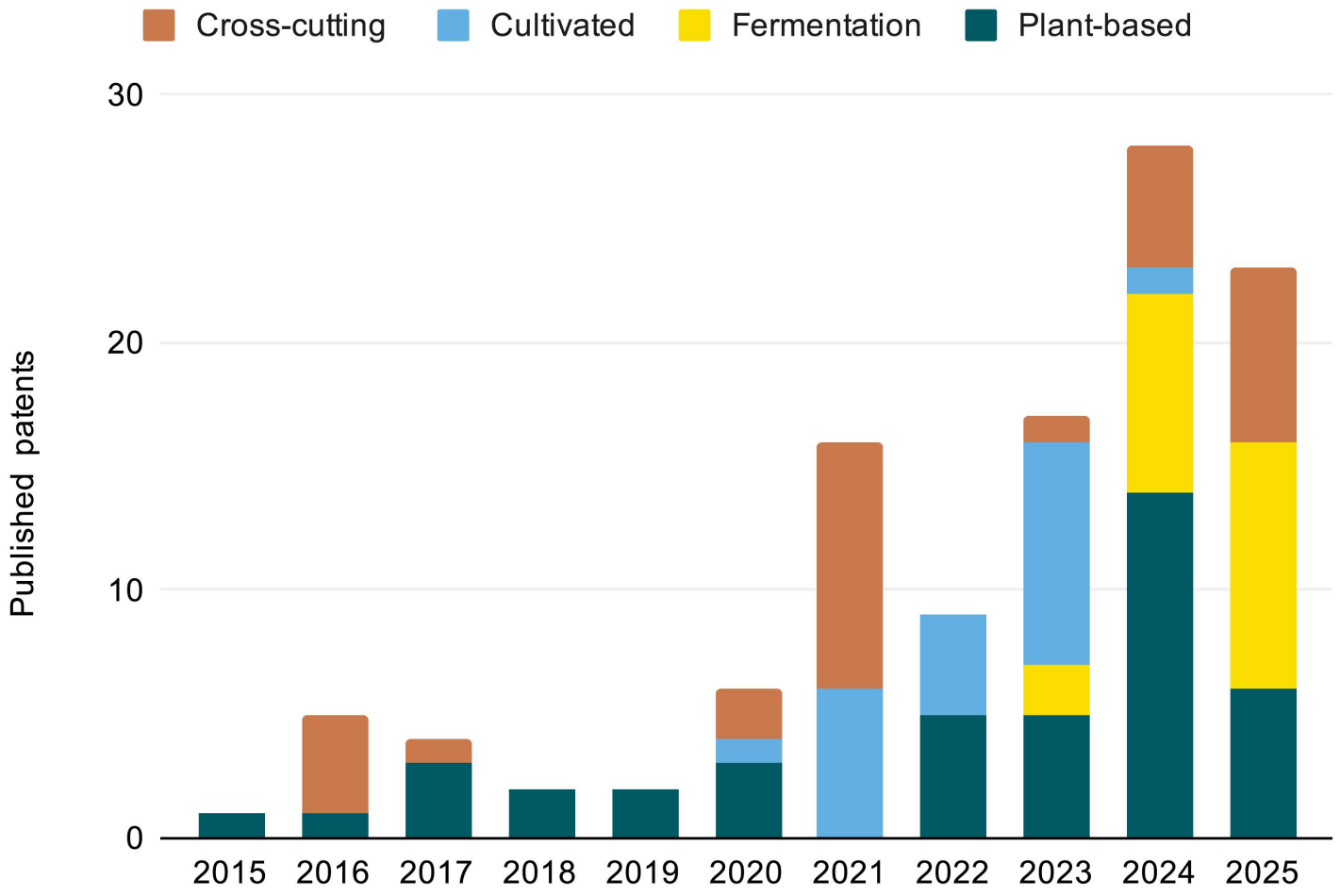
This chart shows the overall number of alternative protein patents published by Spanish innovators in the years 2015-2025 inclusive, stratified by alternative protein pillar.

The number of patents published fluctuated significantly, peaking at 28 in 2024.

There were 113 total patents published by Spanish innovators in the period 2015-2025 – the 11th highest total in Europe.

Breakdown of patents by alternative protein pillar:

- 37% plant-based proteins
- 18% fermentation-made proteins and ingredients
- 19% cultivated meat and seafood
- 27% cross-cutting topics



Given there can often be a significant delay between patenting filing, publication, and granting, this section focuses on patenting trends in the European alternative protein sector since 2015. For glossary of patent terms, see appendix.

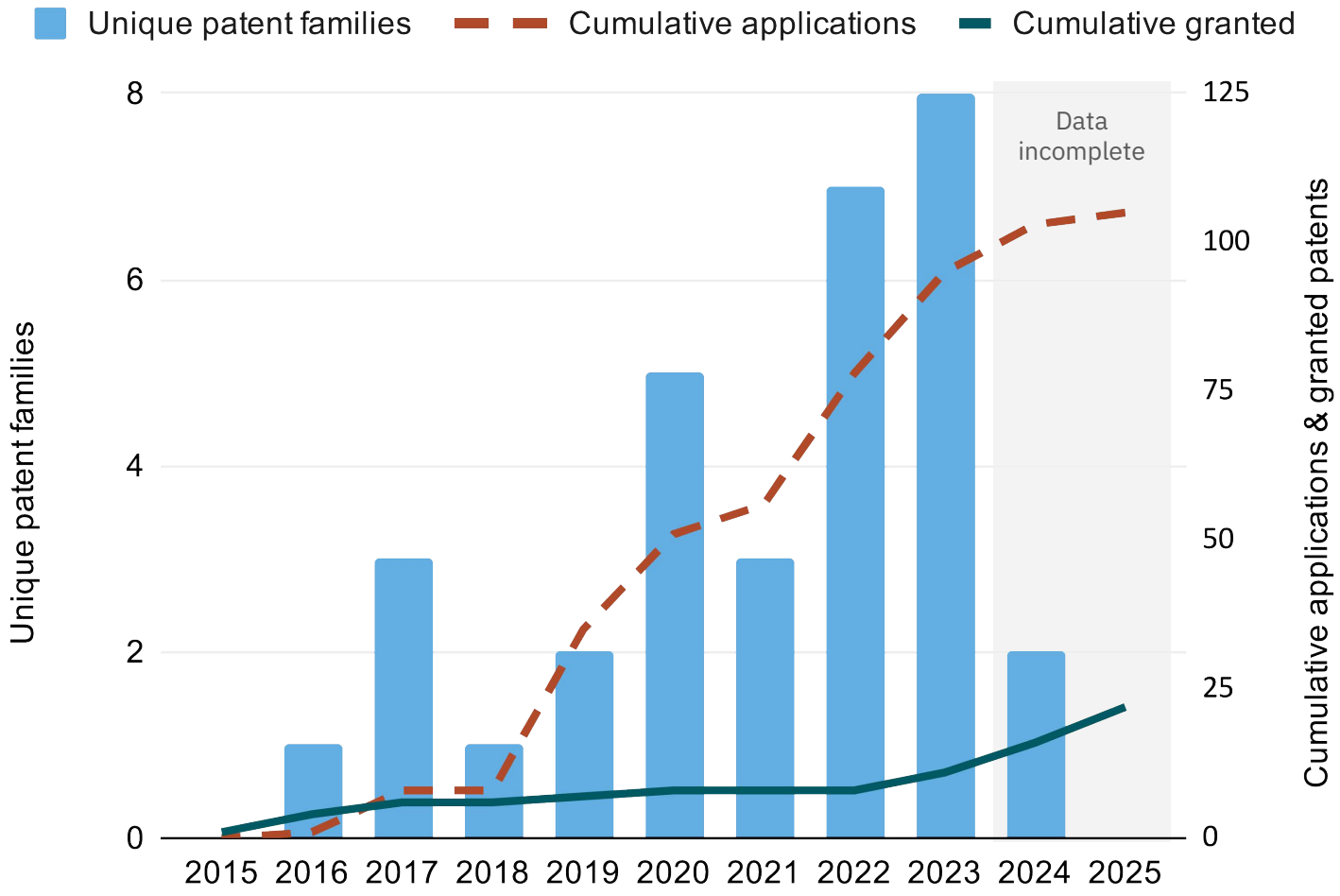
Patents: overall trends

This chart shows trends in unique patent families and cumulative patent filings by Spanish innovators in the years 2015-2025 inclusive, along with the cumulative number of patents that have been granted.

Priority filings – the very first filing on a new invention – have fluctuated since 2015 and peaked at eight in 2023.

Overall, a total of 105 patents have been filed since 2015, with 2019 seeing the highest number of filings at 27.

The number of patents granted has slowly risen, reaching six in 2025, with 22 patents granted in total.



Due to the ~18-month lag between patent filing and publishing, 2024 and 2025 data are incomplete and should be treated with caution. For glossary of patent terms, see appendix.

Deep-dive: Plant-based

This section breaks down funding, publications, and patent trends, using research categories to explore strengths and weaknesses in the field of plant-based meat, seafood, eggs and dairy in Spain.

Research categories:

Plant-based

Crop development

Breeding of crops and increased use of underutilised protein crops for higher protein yields and functionality.

Strain development

Screening and optimisation of novel strains to identify the most efficient pathways for producing targets or modifying substrates.

Texturisation methods

Process innovations, including (but not limited to) novel texturisation methods such as extrusion, electrospinning, 3D printing, and enzymatic processing to match the texture of animal protein.

Ingredient optimisation

Improved protein fractionation and functionalisation for higher-quality ingredients with less processing, and development of novel ingredients to augment nutritional profiles and enhance sensory experience.

End product formulation

Formulation and product design, including fat integration, shelf life, stability, sensory quality, and nutritional assessment and fortification.

Food safety and quality

Toxicological and safety assessments, regulatory improvements, such as assay development or validation.

Health and nutrition

Dietary impacts of alternative proteins including population-wide studies, systematic reviews, and in vitro studies on health impacts such as bioavailability.

Consumer and market research

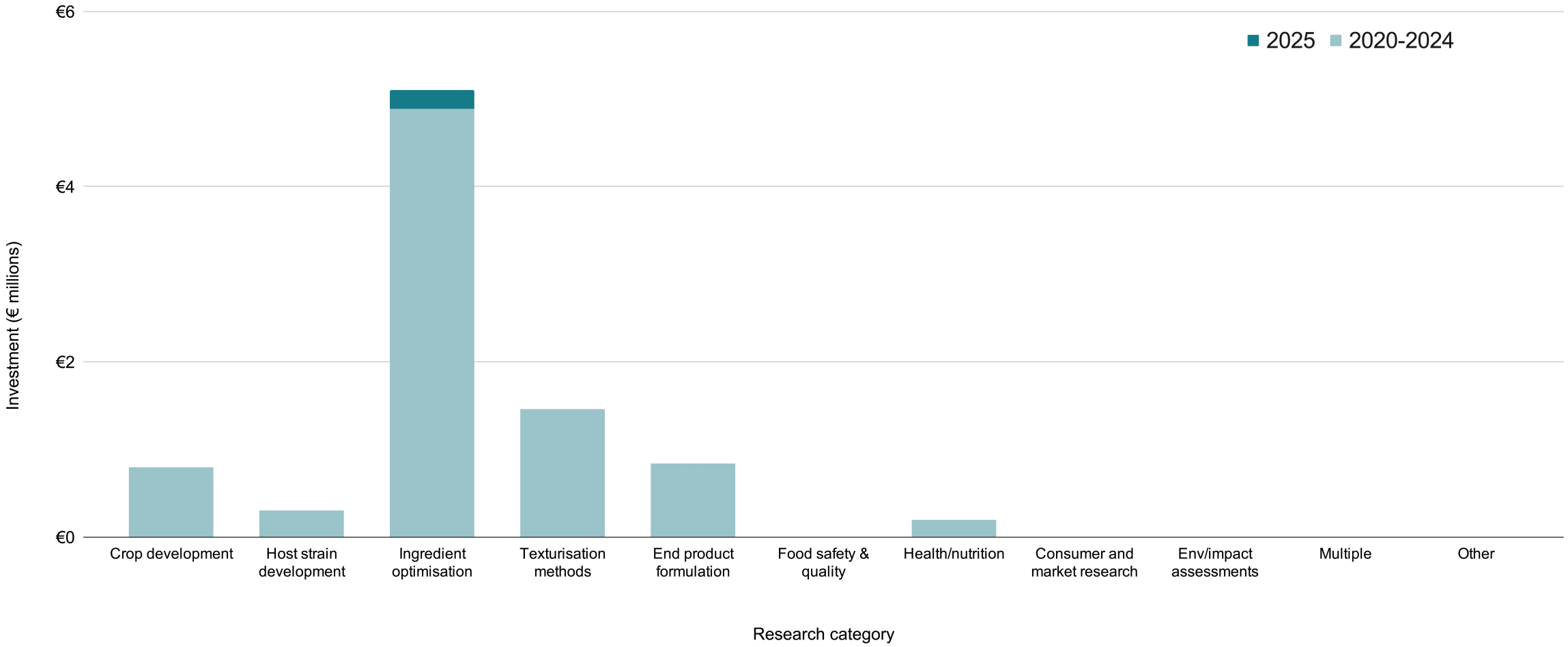
Consumer behaviour research including nomenclature studies, purchasing intent across retail and food environments, and market scoping and brand development.

Impact assessments

Includes life cycle, techno-economic, environmental, social, and geopolitical impact analyses.

Plant-based funding: research categories

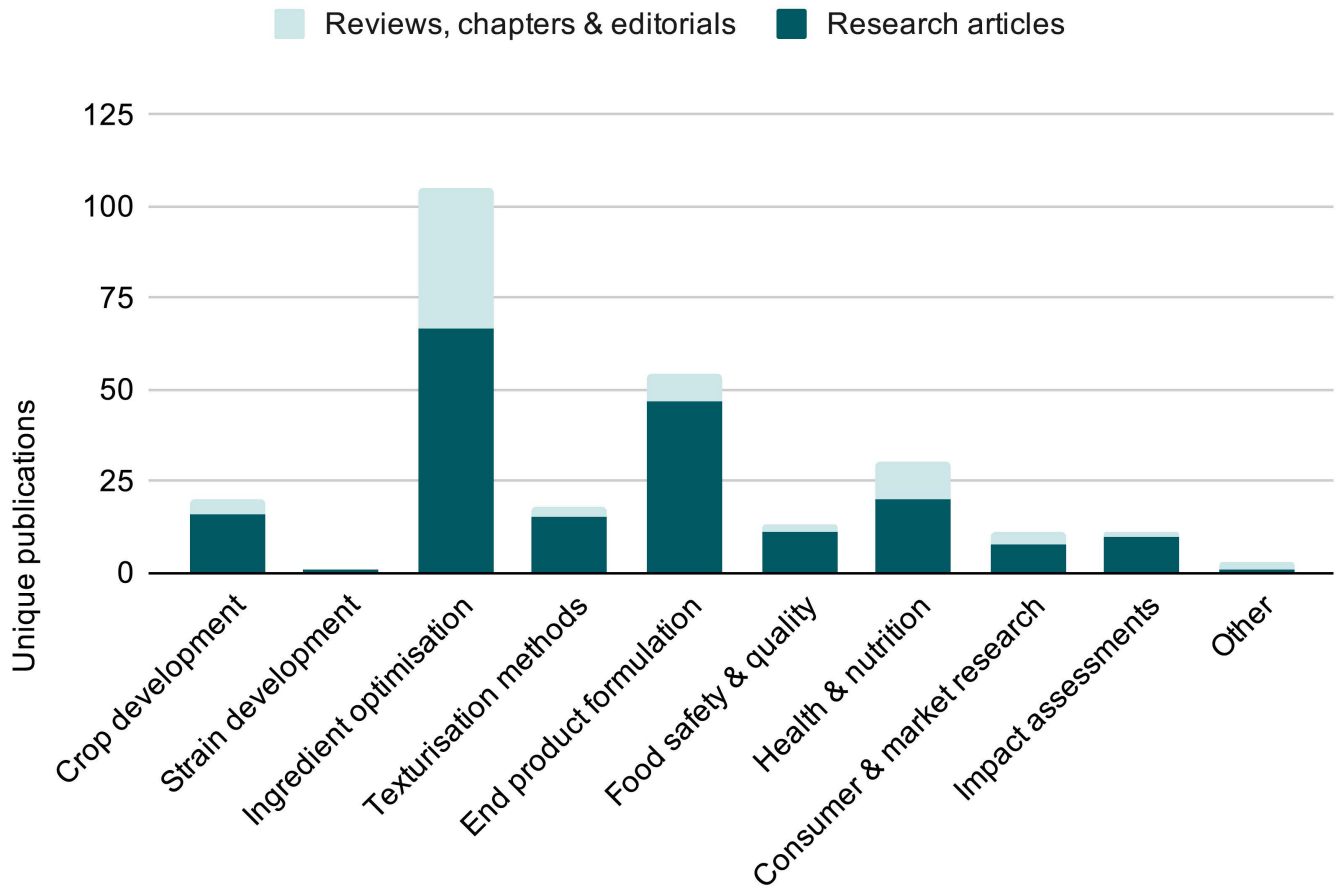
Plant-based investment in Spain, by research category, 2020-2025.
For plant-based science, Spanish research investment has largely gone towards ingredient optimisation. Texturisation received comparatively higher funding than in many similarly positioned countries.



Plant-based publications: research categories

This chart shows a breakdown by research category of Spanish academic publications on plant-based proteins in the years 2020-2025 inclusive.

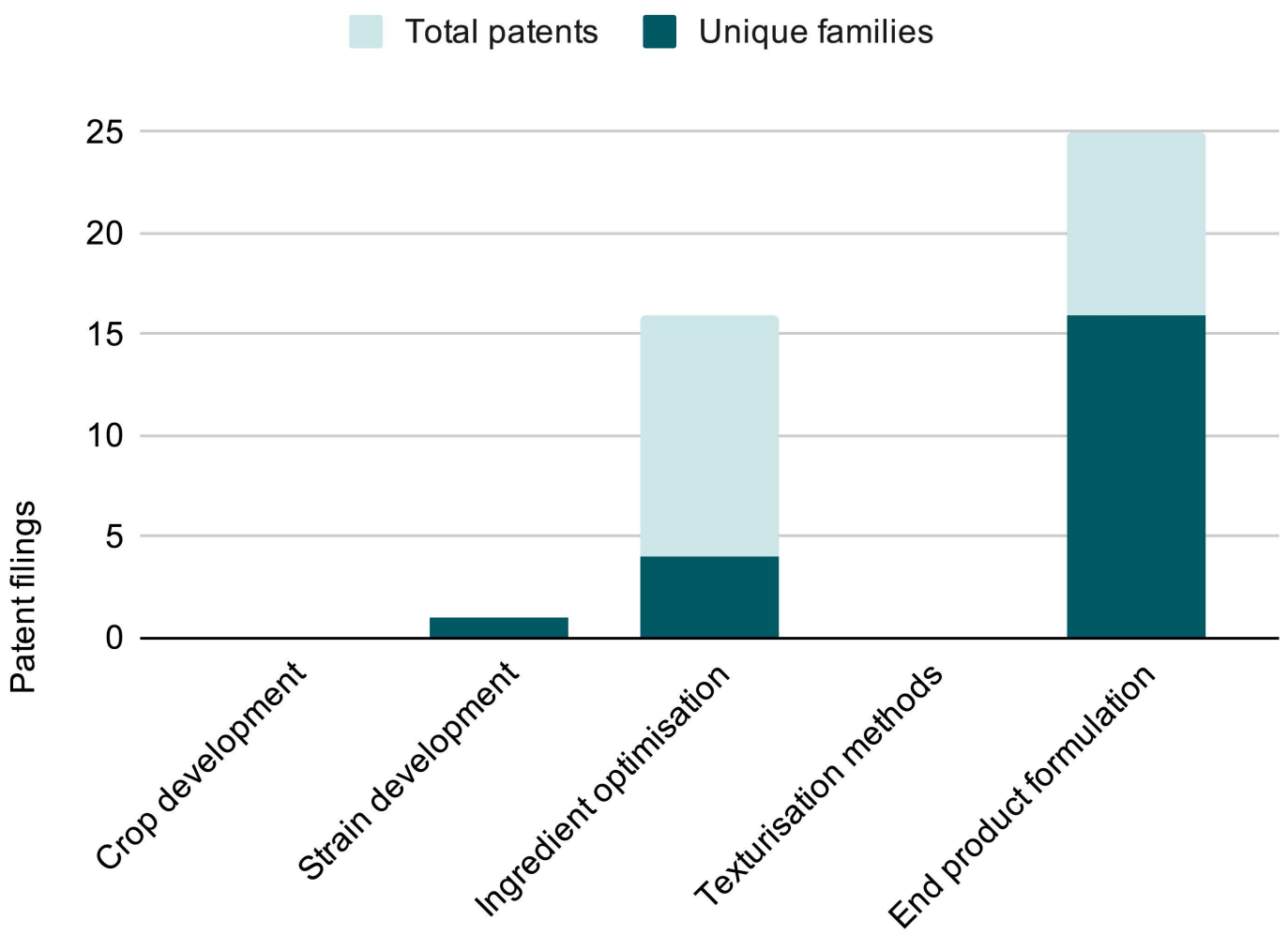
Ingredient optimisation and end product formulation were the most common plant-based research categories, accounting for 39% and 20% of publications, respectively.



Plant-based patents: research categories

This chart provides a breakdown of patent filings by Spanish innovators on technology areas related to plant-based proteins in the years 2015-2025 inclusive.

Almost all plant-based patents filed by Spanish innovators were on end product formulation and ingredient optimisation.



Deep-dive: Fermentation

This section breaks down funding, publications, and patent trends, using research categories to explore strengths and weaknesses in the field of fermentation-enabled alternative proteins in Spain.

Research categories:

Fermentation

Target molecule selection

Target identification and validation to broaden the scope of food ingredients produced by precision fermentation.

Strain development

Screening and optimisation of novel strains to identify the most efficient pathways for producing targets or modifying substrates.

Ingredient optimisation

Improved protein fractionation and functionalisation for higher-quality ingredients with less processing, and development of novel ingredients to augment nutritional profiles and enhance sensory experience.

End product formulation

Formulation and product design, including fat integration, shelf life, stability, sensory quality, and nutritional assessment and fortification.

Health and nutrition

Dietary impacts of alternative proteins including population-wide studies, systematic reviews, and in vitro studies on health impacts such as bioavailability.

Impact assessments

Includes life cycle, techno-economic, environmental, social, and geopolitical impact analyses.

Feedstocks

Media composition and feedstock utilisation strategies (including alternative feedstocks) to improve efficiency, scale and cost.

Bioprocess design

Innovations in bioreactor design and upstream/downstream processes to improve efficiency, monitoring, and control.

Texturisation methods

Developing techniques such as extrusion technology to replicate the fibrous, chewy textures of conventional meat and dairy.

Food and safety quality

Toxicological and safety assessments, regulatory improvements, such as assay development or validation.

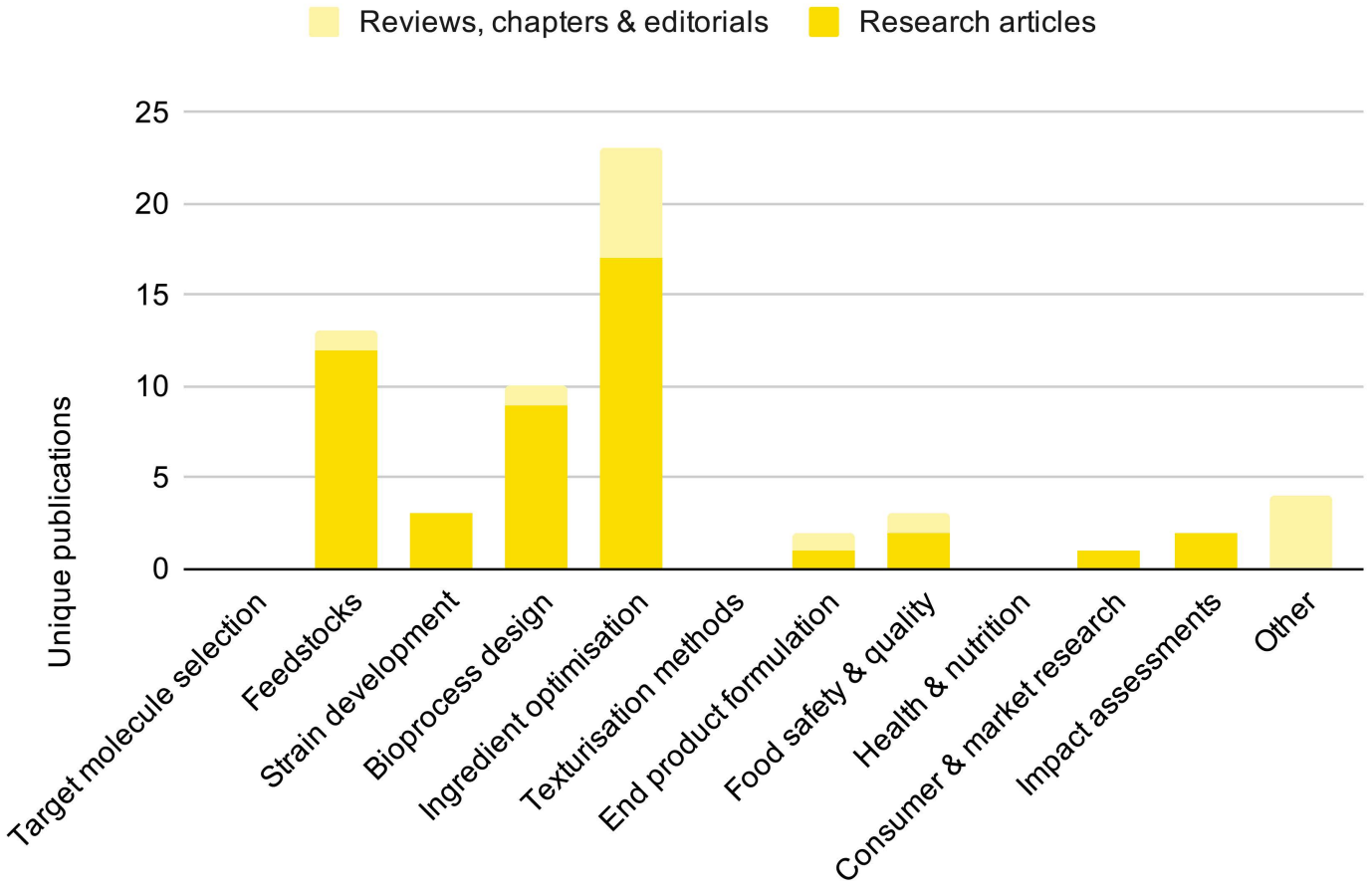
Consumer market and research

Consumer behaviour research including nomenclature studies, purchasing intent across retail and food environments, and market scoping and brand development.

Fermentation publications: research categories

This chart shows a breakdown by research category of Spanish academic publications on fermentation-made proteins and ingredients in the years 2020-2025 inclusive.

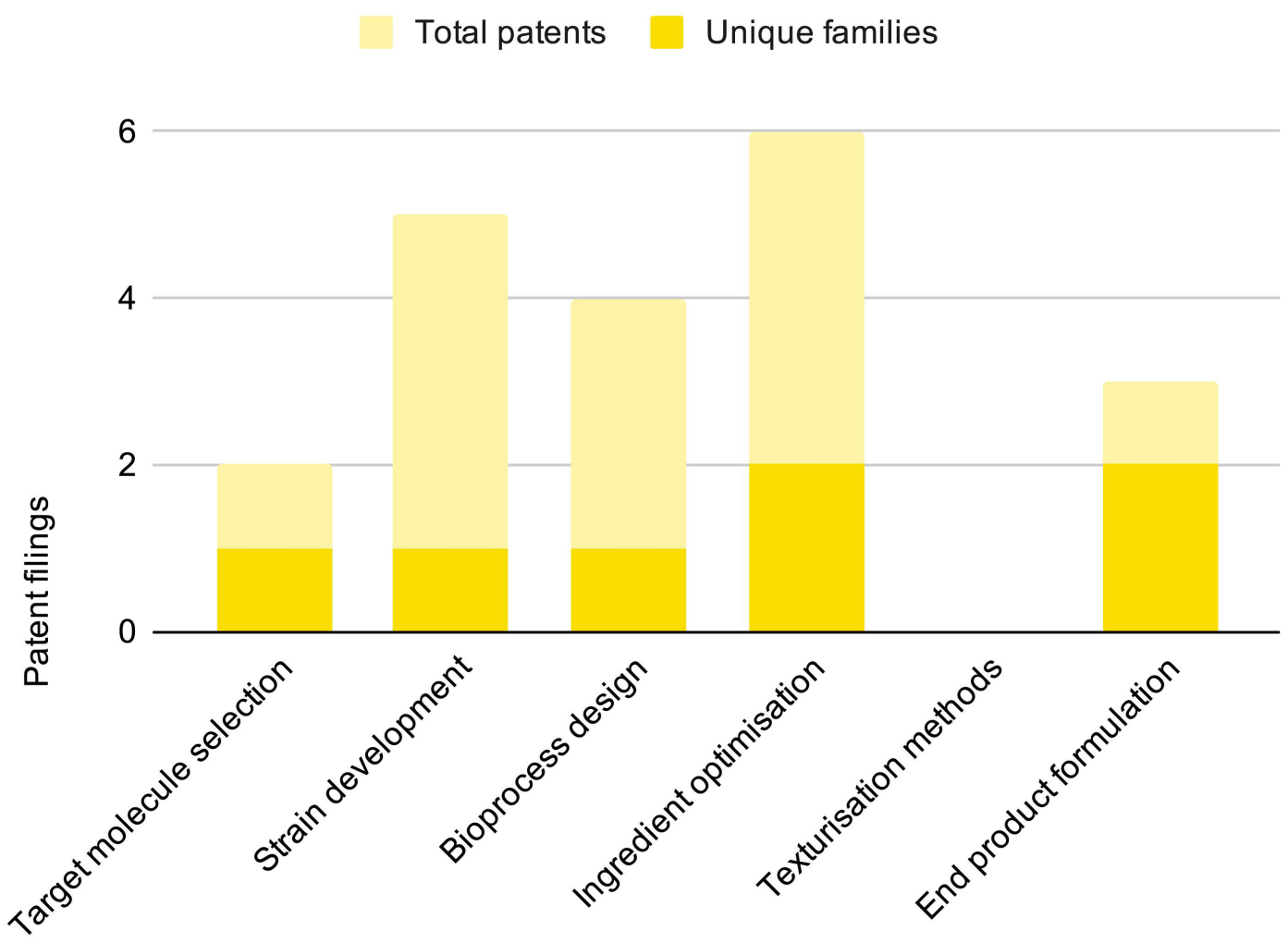
Spanish fermentation researchers mostly focused on ingredient optimisation (38% of all publications), followed by feedstocks (21%) and bioprocess design (16%).



Fermentation patents: research categories

This chart provides a breakdown patent filings by Spanish innovators on technology areas related to fermentation-made proteins and ingredients in the years 2015-2025 inclusive.

The Spanish fermentation innovation ecosystem remains immature but has filed patents across several research categories.



Deep-dive: cultivated

This section breaks down funding, publications, and patent trends, using research categories to explore strengths and weaknesses in the field of cultivated meat and seafood in Spain.

Research categories:

Cultivated

Cell line development

Sourcing, optimising, and banking new and existing cell lines to achieve faster growth, greater stability and stress tolerance, improved performance (including adherence and differentiation), and higher density across terrestrial and aquatic cell lines.

Bioprocess design

Innovations in bioreactor design and upstream/downstream processes to improve efficiency, monitoring, and control.

Texturisation methods

Developing techniques such as extrusion technology to replicate the fibrous, chewy textures of conventional meat and dairy.

Consumer market and research

Consumer behaviour research including nomenclature studies, purchasing intent across retail and food environments, and market scoping and brand development.

Food safety and quality

Toxicological and safety assessments, regulatory improvements, such as assay development or validation.

Cell culture media

Reducing cell culture media costs and increasing their availability by characterising and validating novel sources of growth factors, amino acids, and other media components.

Scaffolding

Improved scaffolding biomaterials that support cell adherence and differentiation to allow the replication of complex animal meat structures.

End product formulation

Formulation and product design, including fat integration, shelf life, stability, sensory quality, and nutritional assessment and fortification.

Health and nutrition

Dietary impacts of alternative proteins including population-wide studies, systematic reviews, and in vitro studies on health impacts such as bioavailability.

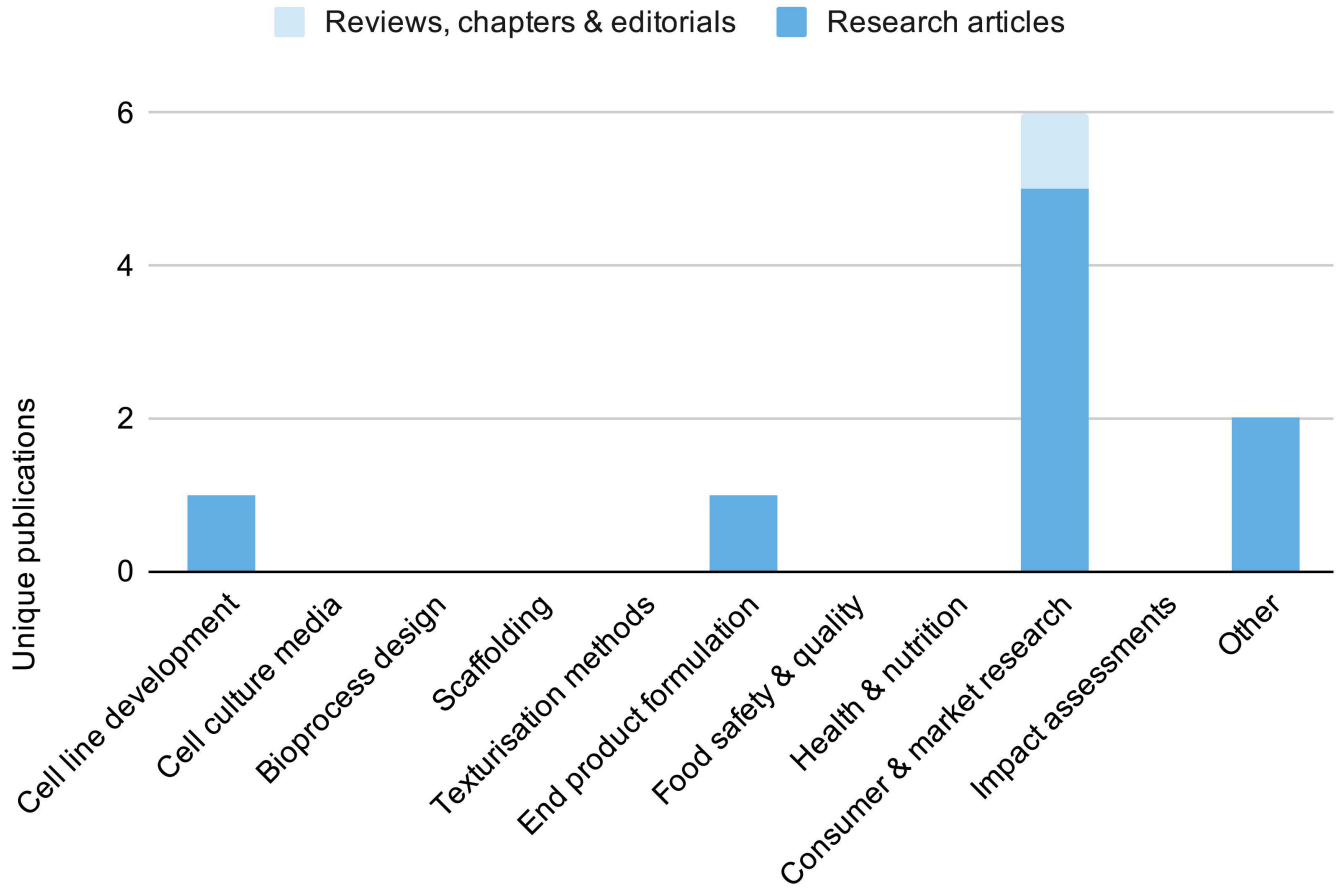
Impact assessments

Includes life cycle, techno-economic, environmental, social, and geopolitical impact analyses.

Cultivated publications: research categories

This chart shows a breakdown by research category of Spanish academic publications on cultivated meat and seafood in the years 2020-2025 inclusive.

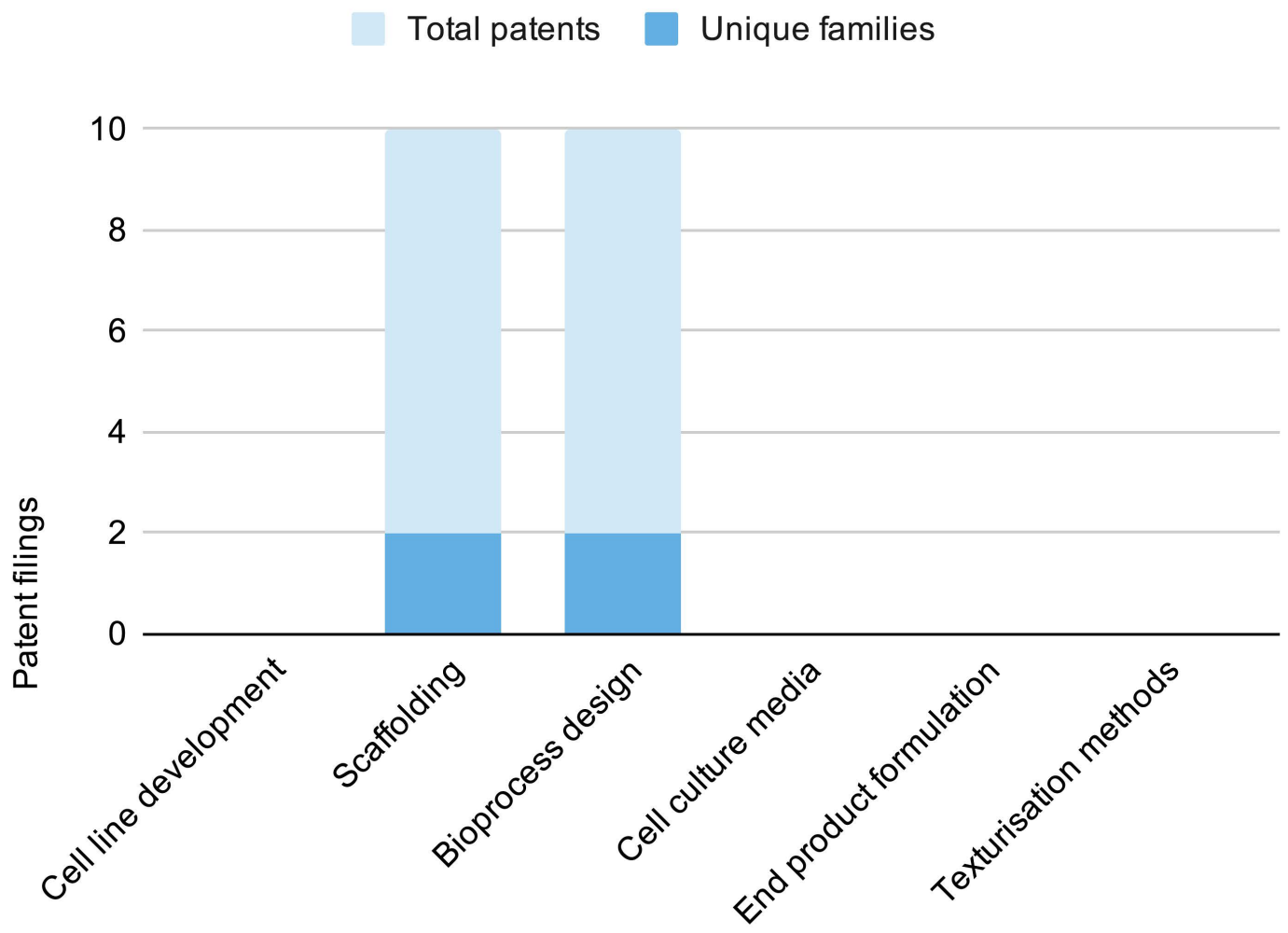
The Spanish cultivated meat and seafood research community remains very small and most publications focused on consumer & market research.



Cultivated patents: research categories

This chart provides a breakdown of patent filings by Spanish innovators on technology areas related to cultivated meat and seafood in the years 2015-2025 inclusive.

The Spanish cultivated meat and seafood innovation ecosystem remains immature but has focused on scaffolding and bioprocess design.



Appendix and methods

Methodology

For full methods including search terms, inclusion and exclusion criteria and other technical details, please see the full technical appendix **here.**

Funding

Data
Data sourced from GFI's publicly available global research funding database, the GFI Research Grants Tracker, which houses information published by funders and research conductors globally. Kernel Science contributed to data retrieval. Funding information was also retrieved from Dimensions.ai.

Time period
2010-2025. Data retrieved in February 2026.

Country focus
EU27 + Norway + Switzerland + UK.

Search strategy
A list of search terms was developed and Dimensions.ai results screened against predefined inclusion/exclusion criteria to identify those in scope for the study.

Grants focusing plant-based, fermentation-made, or cultivated proteins and ingredients meeting these criteria were analysed by title, recipient, funder country, pillar categorisation, end product and research sub-category.

Publications

Data
Data sourced from Dimensions, an interlinked research information system provided by Digital Science (https://www.dimensions.ai).

Time period
2020-2025. Data retrieved January 2026.

Country focus
EU27 + Norway + Switzerland + UK.

Search strategy
Complex search terms were devised that allowed us to trigger numerous publications that may be relevant to our analysis.

Search returns were screened against predefined inclusion/exclusion criteria to identify those in scope for the study.

Publications relevant to plant-based, fermentation-made, or cultivated proteins and ingredients meeting these criteria were analysed in the Dimensions Landscape & Discovery application and in spreadsheet format.

Patents

Data
Data sourced from Dimensions, an interlinked research information system provided by Digital Science (https://www.dimensions.ai).

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2015-2025. Data retrieved February 2026.

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EU27 + Norway + Switzerland + UK.

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Patents relevant to plant-based, fermentation-made, or cultivated proteins and ingredients meeting these criteria were analysed in the Dimensions Landscape & Discovery application and in spreadsheet format.

Key terminology: patents

Patent	An exclusive right granted for an invention that excludes others from making, using, offering for sale, or selling the invention. Patents benefit inventors by providing them with legal protection for their inventions. To receive this protection, they must publicly disclose details of the invention.
Patent family	A collection of patents covering the same or similar technical content disclosed by a common inventor(s) and patented in more than one country.
Priority date	Sometimes called the “effective filing date”, this is the first filing date in a family of patent applications and is used to establish the novelty and/or obviousness of a particular invention relative to other art. Each patent family will only have one priority date.
Filing date	The date when a patent application is first filed in the respective patent office. As there are no global patents, there may be numerous patent filings in different jurisdictions from the same patent family, each with its own filing date.
Publication date	The date on which the patent application is published (ie, the information is available to the public). This normally occurs approximately 18 months after the filing date.
Assignee	Organisation(s) and individual(s) that have an ownership interest in the legal rights a patent offers. An assignee is often the organisation employing the inventor of the technology. An assignee can also change at a later date.
Jurisdiction	The legal territory in which a patent is sought, for example, France, Spain, etc. Each patent must be filed with a national patent office in the country where protection is sought and there are no global patents.
Patent legal status	The current legal status of the patents, eg. ‘Granted’, ‘Active’, ‘Abandoned’, etc.

The patenting process

There are differences between patent offices in how a patent application is processed once it has been filed, but a general overview of the process is described in the table below.

For a more detailed explanation, please refer to this resource from the World Intellectual Property Organization. A detailed description of the European patent application process can be found here.

1.	**Formal examination**	The application is examined to ensure it complies with the administrative requirements set by the patent office.
2.	**Prior art search**	A search is conducted to identify prior art that will be relevant in determining the patentability of the claimed invention.
3.	**Substantive examination**	A more detailed examination is carried out to ensure the claimed invention satisfies the main criteria for patentability (patentable subject matter, novelty, inventive step, industrial applicability and sufficiency of disclosure).
4.	**Notification**	Results of the examination are sent to the applicant or their legal representative and they are given an opportunity to respond to any objections raised.
5.	**Publication of patent application**	The patent application is usually published approximately 18 months after the filing date.
6.	**Granting of patent**	If the outcome of the examination is positive, the patent office grants the patent.
7.	**Publication of granted patent**	The granted patent is published and the invention is disclosed to the public.
8.	**Pre-grant and/or post-grant opposition**	Patent offices offer others the opportunity to oppose the grant of a patent, for example, if they believe the claimed invention is not new. Opposition proceedings can be held before or after the patent is granted.

About this report

Authors
Dr David Hunt, Dr Stella Child

Acknowledgements
Kernel Science contributed to the funding data collection.

Citation
Child S., Hunt D., State of the alternative protein research and innovation ecosystem in Spain, 2020-2025 (2026). *GFI Europe.*
DOI: 10.5281/zenodo.20146496.

About GFI Europe
The Good Food Institute Europe is a nonprofit think tank helping to build a more sustainable, secure and just food system by diversifying protein production.