



Country deep dive:
UK

State of the European alternative protein research and innovation ecosystem

Dr David Hunt and Dr Stella Child



Alternative protein research in the UK

After successive years of growing investment in the field, the UK pressed pause in 2025, while the newly funded major research centres establish themselves.

The UK is home to a burgeoning alternative protein R&I community and is well positioned to be a leader in the space if continued funding can be secured.



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

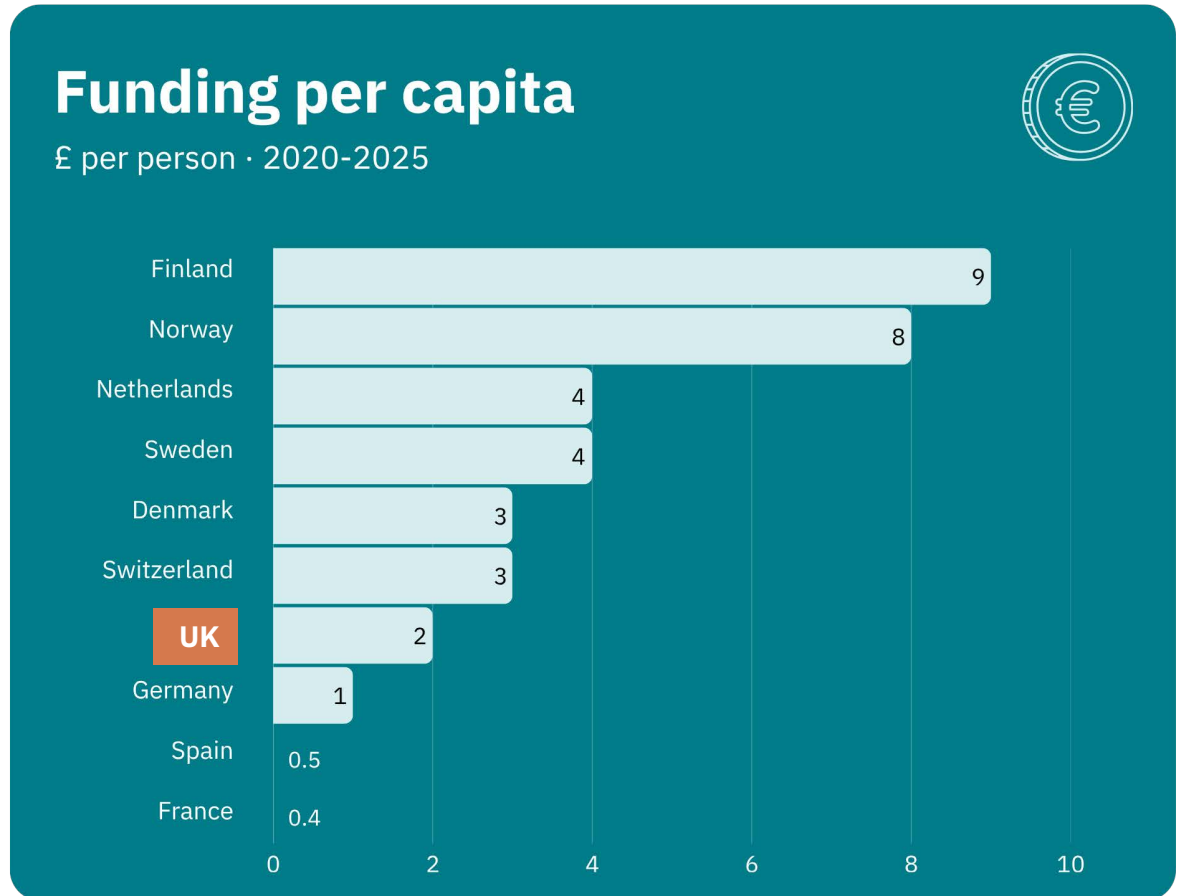
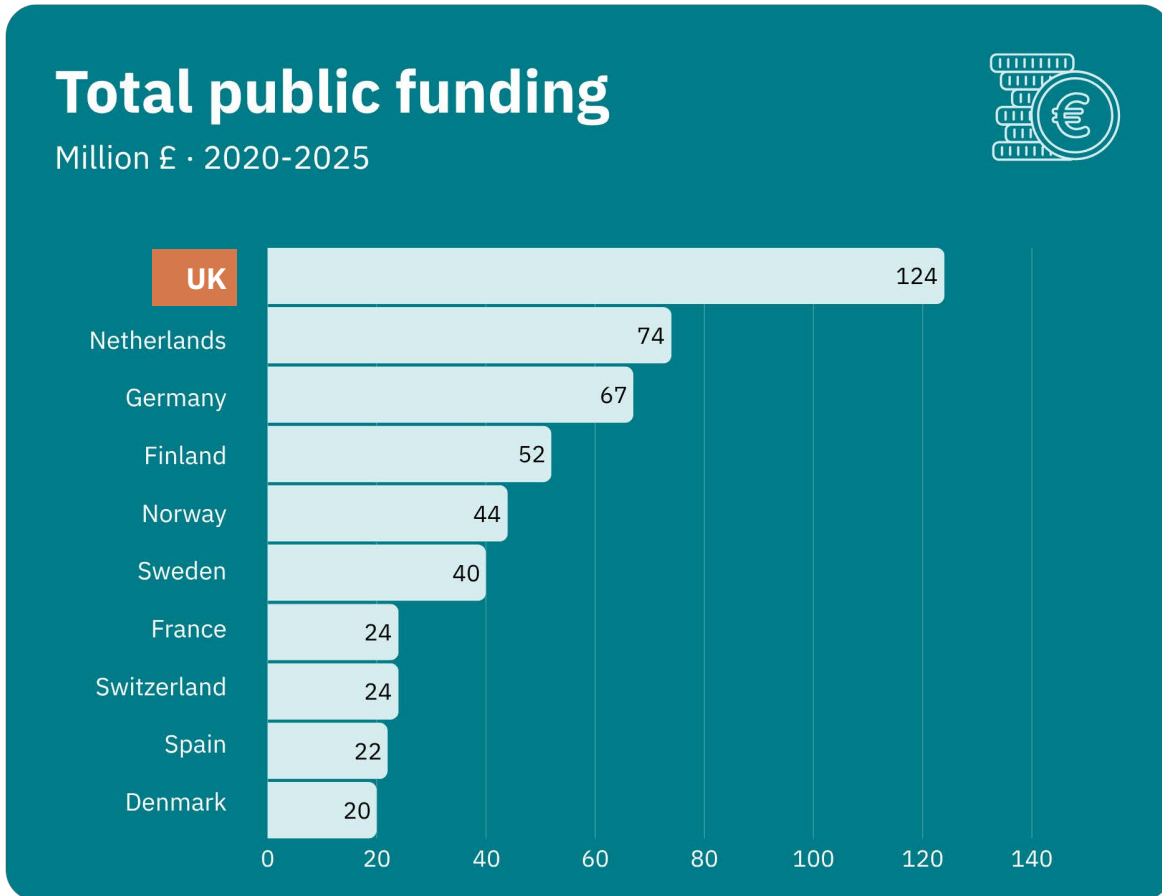
Cross-cutting

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.

UK funding compared with governments across Europe

Investment from the top 10 governments funding alternative proteins in Europe, 2020-2025, and their respective per capita spend.

The UK ranks 1st for total public funding,* but only 8th on a per capita basis.**



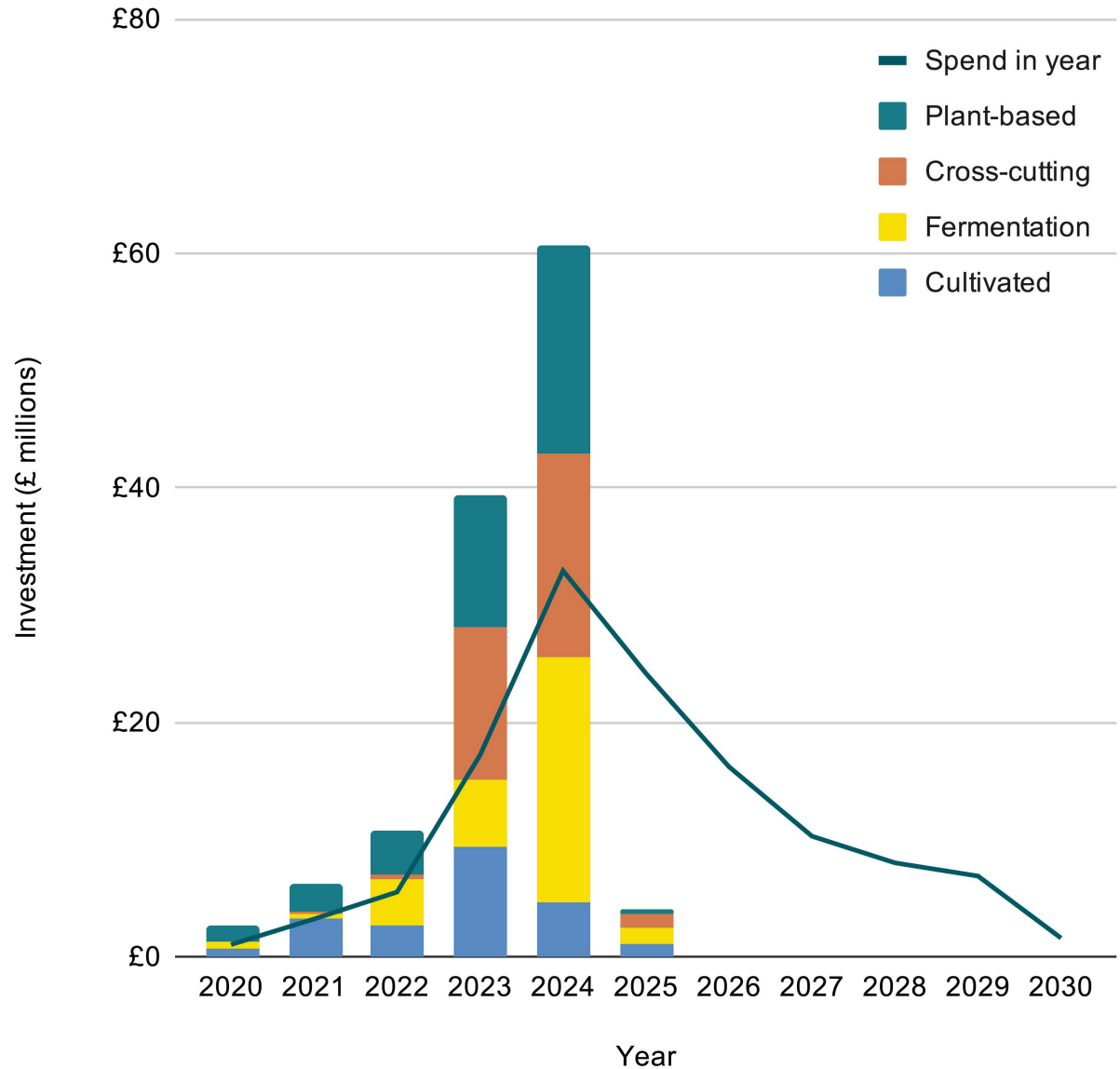
*Funding for some countries, such as the Netherlands, France, and Belgium, is likely an underestimate. **Per capita spending is only shown for the top 10 countries by total public research funding. Note that this is not a ranking of the top 10 by per capita spending, and that some countries in the top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

UK funding across alternative protein pillars

This graph shows investment from UK government funders* broken down by production pillar, 2020-2025, showing estimated in-year spend over the lifetime of projects.

The UK stands out internationally as having taken a very even approach across the three pillars of alternative proteins. Few other countries have matched the UK in making leading investments across the board.

However, the significant drop in funding in 2025, after several years of increasing funding, means the UK risks losing momentum and the newly established academic community may struggle to secure reliable funding.



*Nonprofit investments and investments from international funders are not shown.

Publications: overall trends

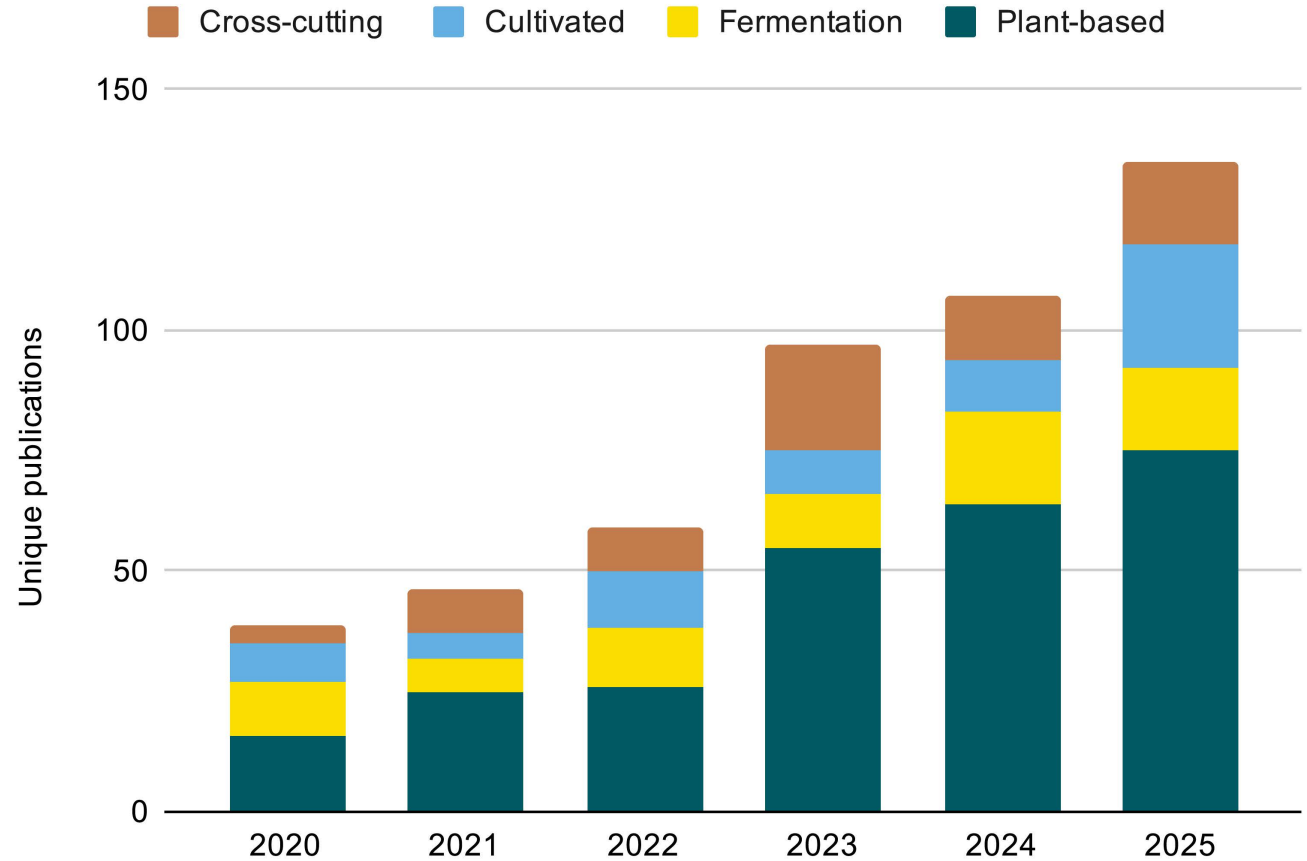
This chart shows the overall trends in academic publications in peer-reviewed journals on topics related to alternative proteins in the period 2020-2025.

UK researchers contributed to 483 publications on topics related to alternative proteins in the period 2020-2025, ranking third overall in Europe.

Publication outputs grew by 29% per year on average in this period. There were 135 research publications in 2025 compared to 39 in 2020 – a 246% increase.

Breakdown of publications by alternative protein pillar:

- 54% plant-based proteins
- 16% fermentation-made proteins and ingredients
- 15% cultivated meat and seafood
- 15% cross-cutting topics



Leading research-performing organisations

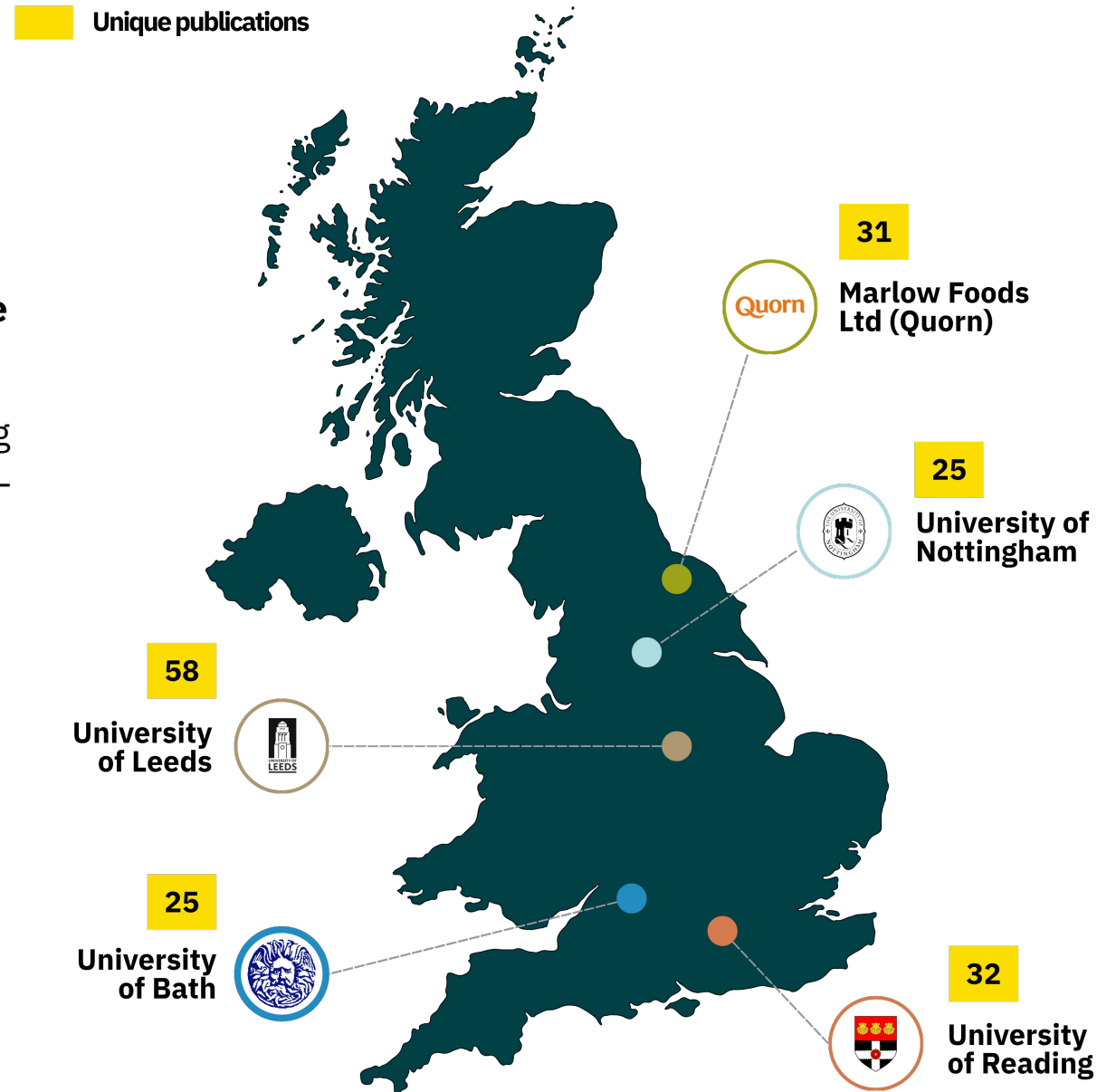
This map shows the leading institutions and companies for alternative protein research in the UK on the basis of unique publications in the period 2020-2025.

Of the top 100 most-productive European research-performing organisations in alternative protein research, 14 are in the UK – the highest of any country.

The most highly ranked UK organisation is the University of Leeds, which ranked 11th for total publications in 2025 and 14th overall for the period 2020-2025.

The UK has been the most productive country in both fermentation and cultivated meat research since 2020 and ranks fifth for total plant-based research publications.

Following significant public and nonprofit investment in recent years, the UK is fast becoming home to an expanding network of research centres dedicated to alternative protein science.



Patents: overall trends

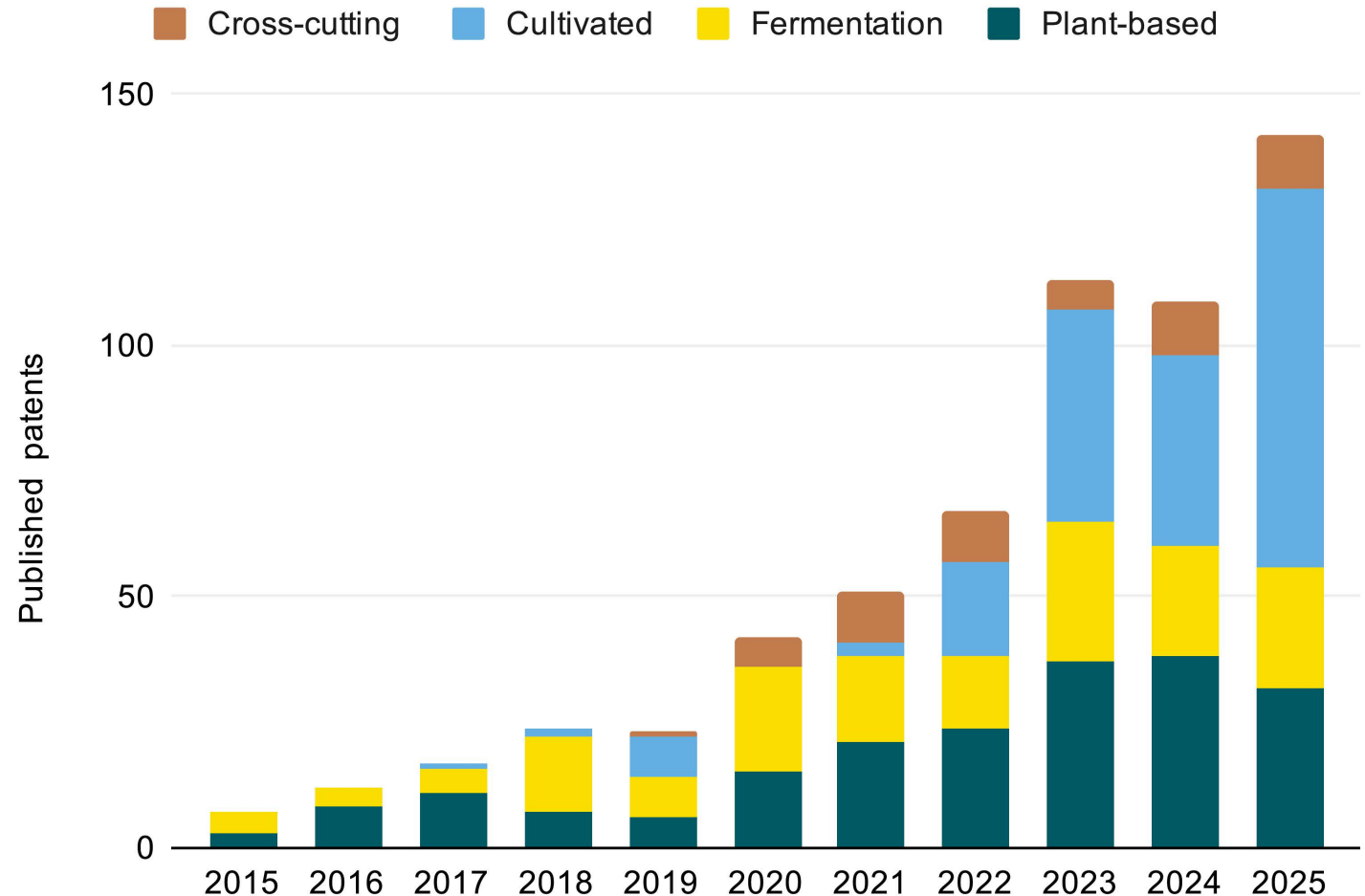
This chart shows the overall number of alternative protein patents published by UK innovators in the years 2015-2025 inclusive, stratified by alternative protein pillar.

Aside from a slight dip in 2024, the number of patents published has risen each year since 2019, reaching 142 in 2025.

There were 607 total patents published by UK innovators in the period 2015-2025 – the fifth highest total in Europe.

Breakdown of patents by alternative protein pillar:

- 33% plant-based proteins
- 27% fermentation-made proteins and ingredients
- 31% cultivated meat and seafood
- 9% cross-cutting topics



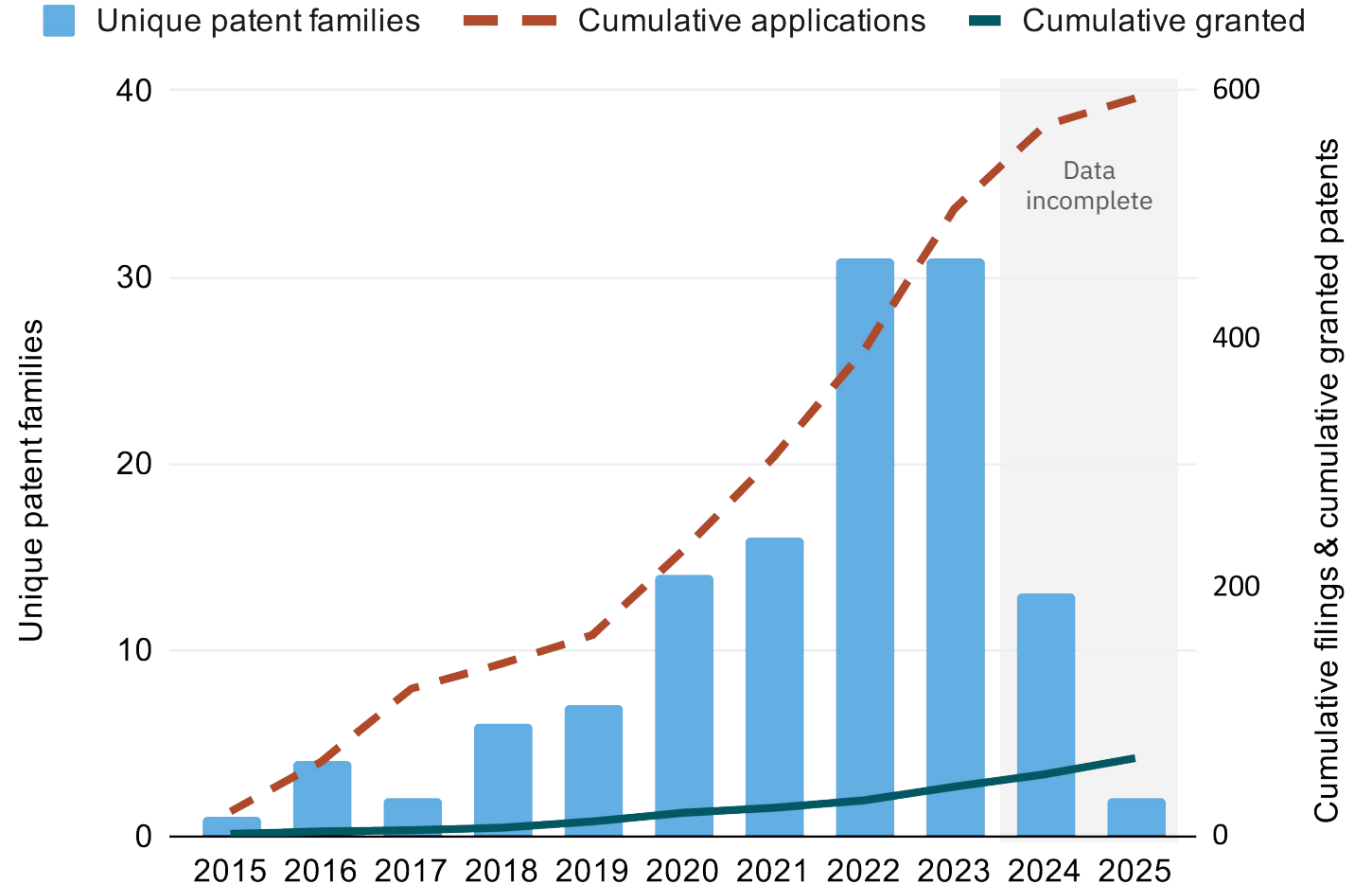
Patents: overall trends

This chart shows trends in unique patent families and cumulative patent filings by UK 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 – began to rise significantly in 2020 and peaked at 31 in both 2022 and 2023.

Overall, a total of 594 patents have been filed since 2015, with 2023 seeing the highest number of filings at 114.

The number of patents granted has also risen, reaching 13 in 2025, with 63 patents granted in total.



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 the UK.



Research categories: Plant-based



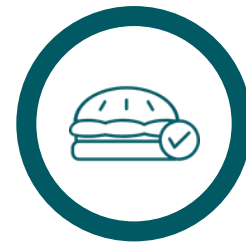
Crop development

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



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.



Impact assessments

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



Health and nutrition

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



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.



Food safety and quality

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



Consumer and market research

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



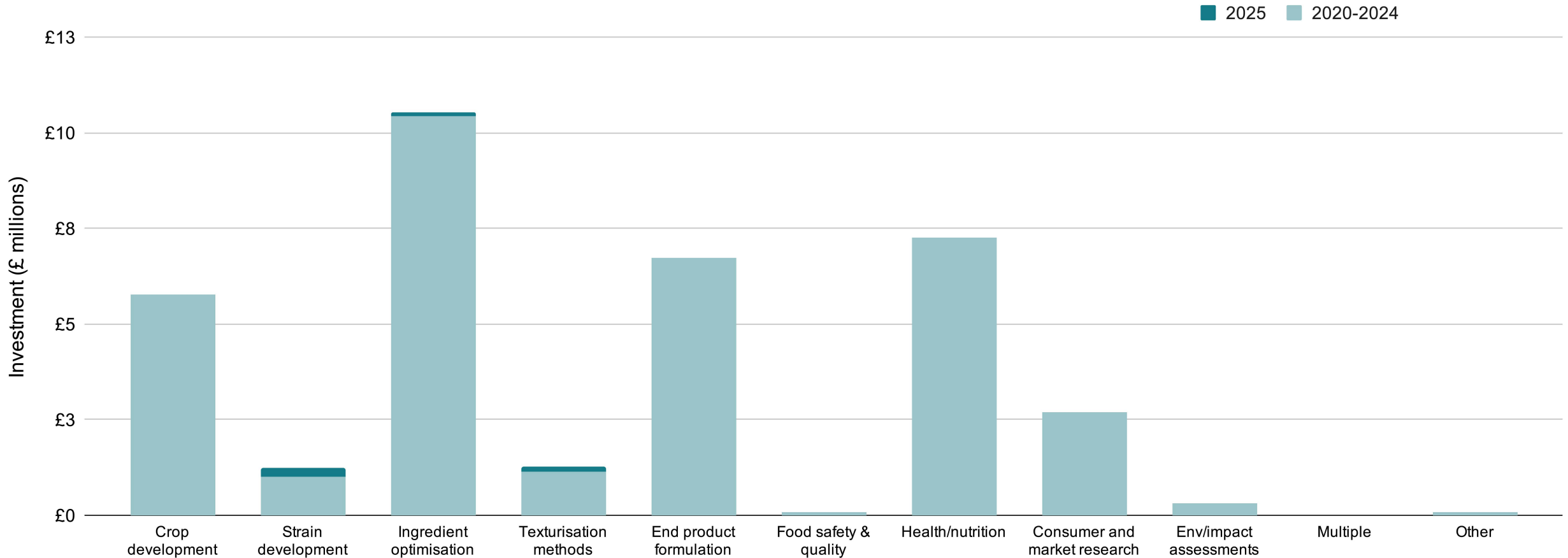
Strain development

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

UK plant-based deep dive: research categories

Plant-based investment from the UK, broken down by research category, 2020-2025.

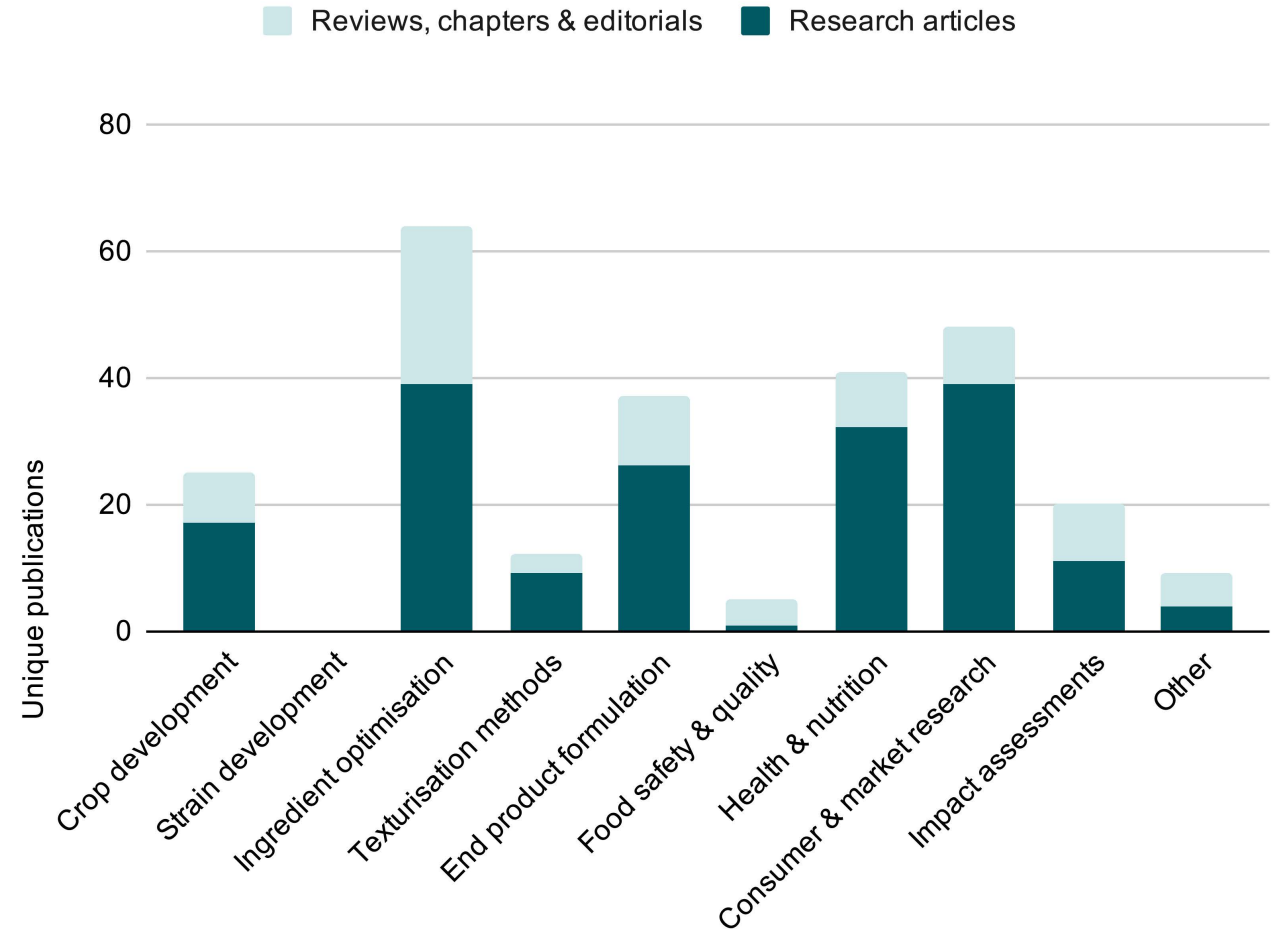
Investment in the UK has focused on crop development, and food science aspects such as ingredient optimisation and end product development, with notably weaker funding for texturisation and food safety and quality.



Plant-based publications: research categories

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

UK researchers have focused on a diverse range of research categories, including ingredient optimisation (25% of all publications), consumer & market research (18%), and health & nutrition (16%).

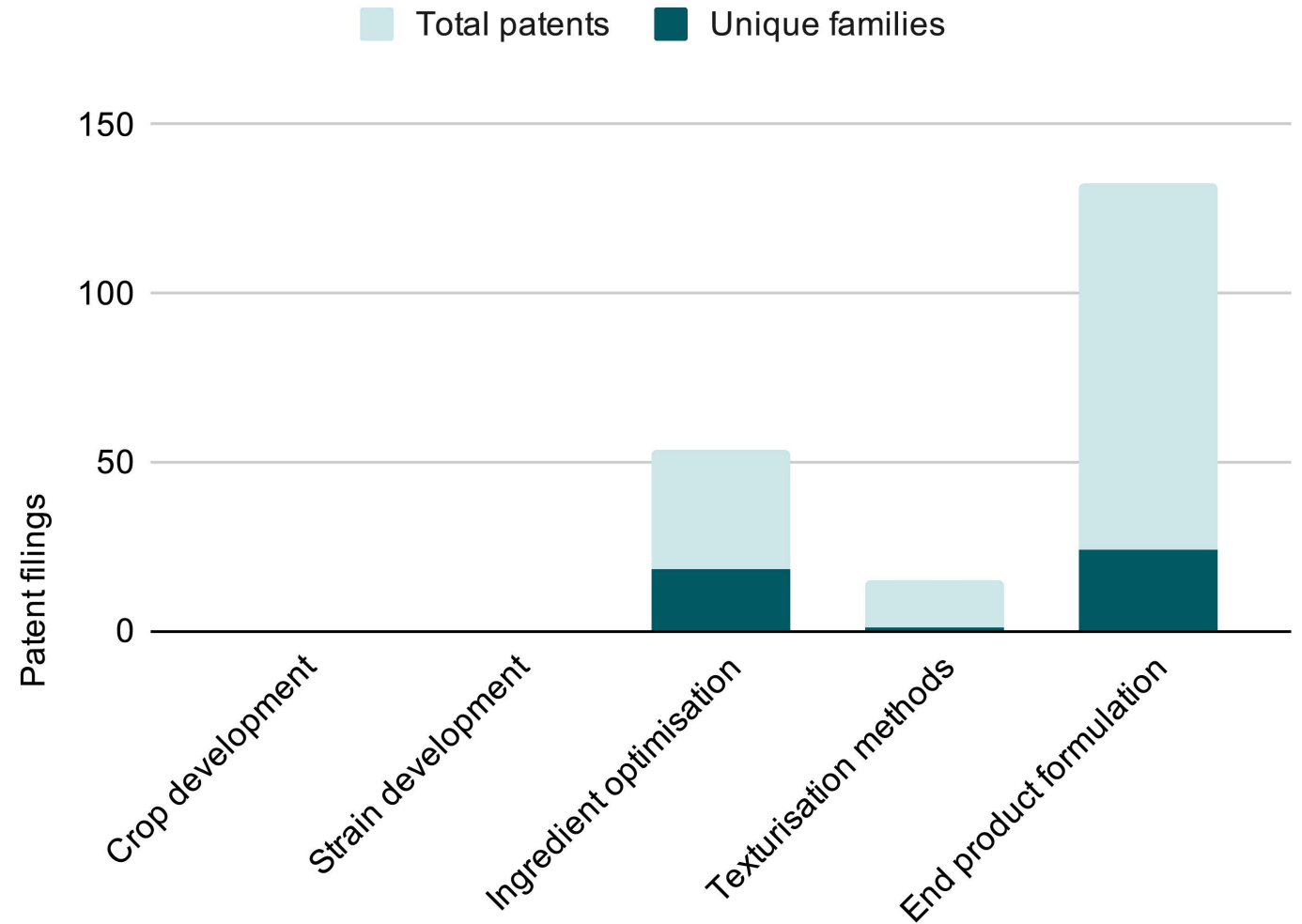


Plant-based patents: research categories

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

UK innovators filed patent applications mostly in relation to end product formulation (66% of all filings) and ingredient optimisation (27%).

Innovations in novel protein crops and strains for modifying plant protein characteristics remain neglected by UK innovators.

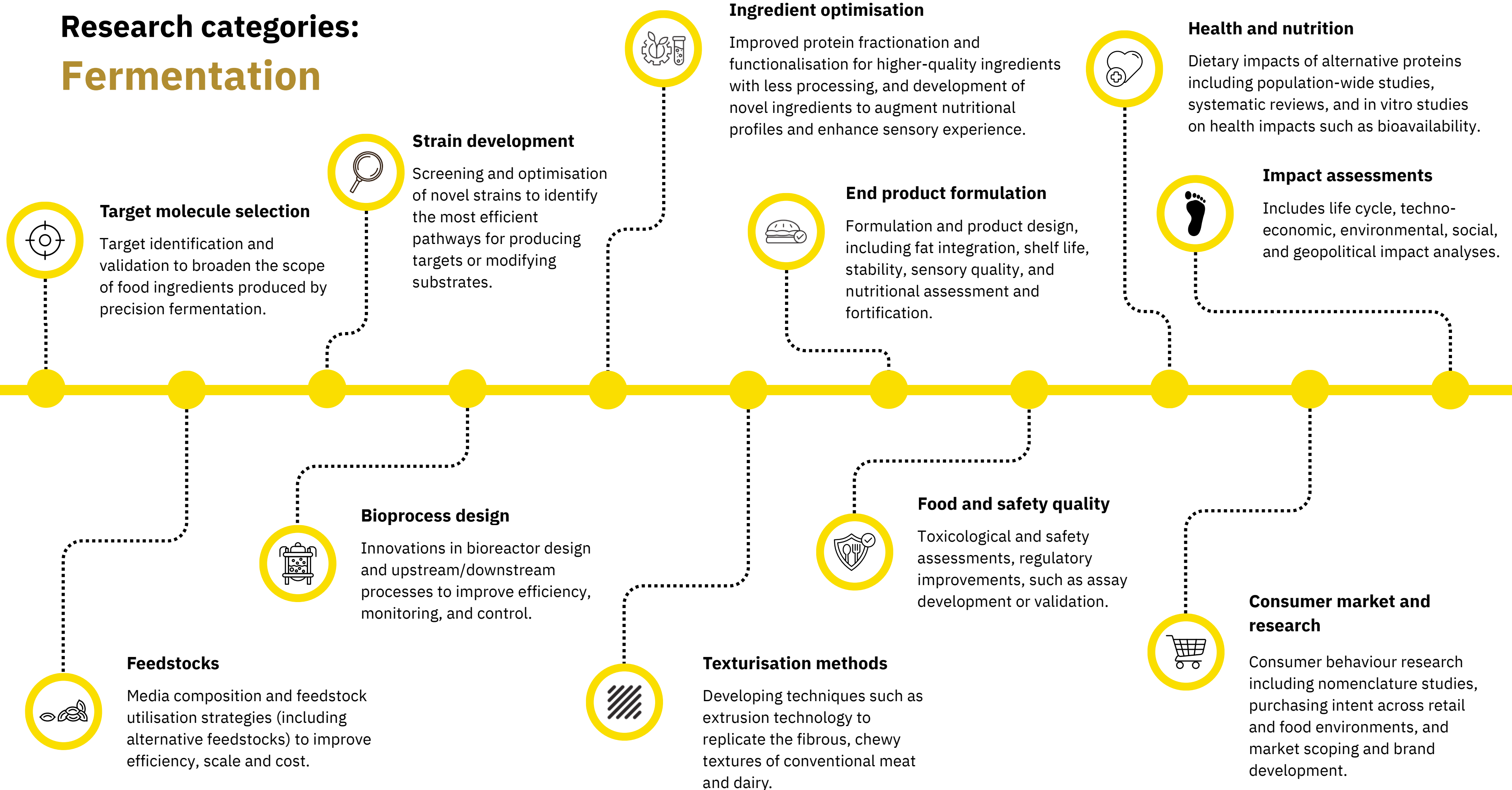


Deep-dive: Fermentation

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 the UK.



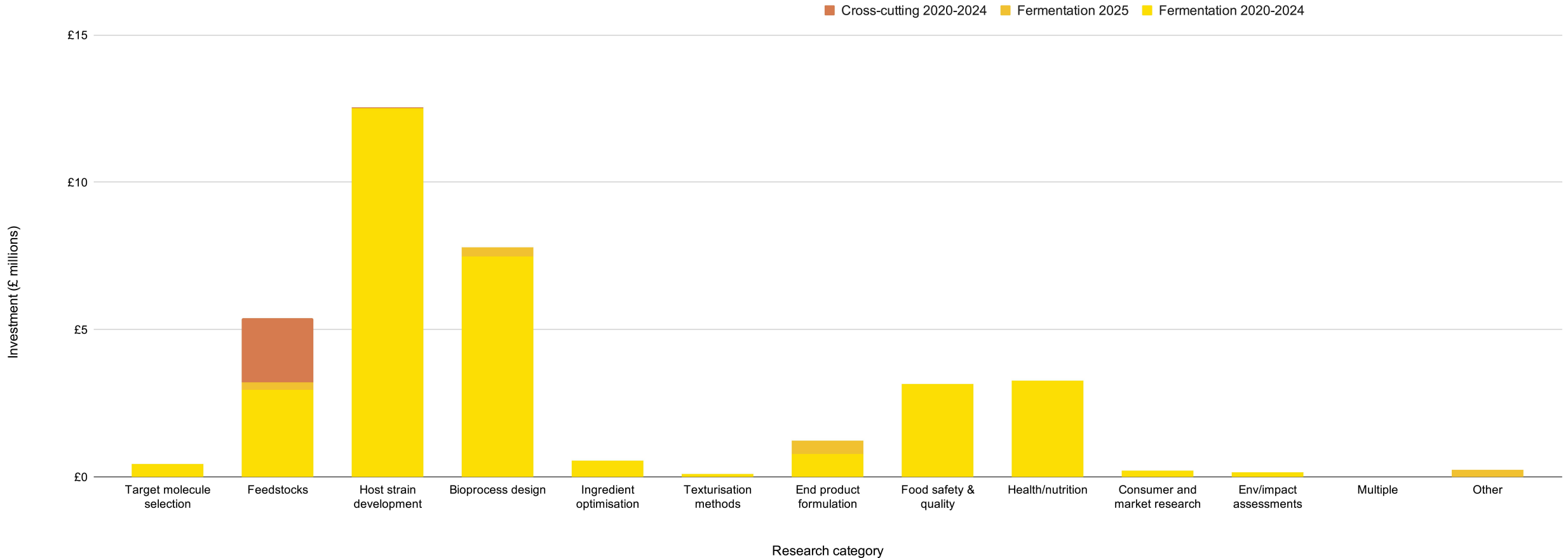
Research categories: Fermentation



UK fermentation deep dive: research categories

Fermentation investment from the UK, broken down by research category, 2020-2025, showing cross-cutting investments where relevant.

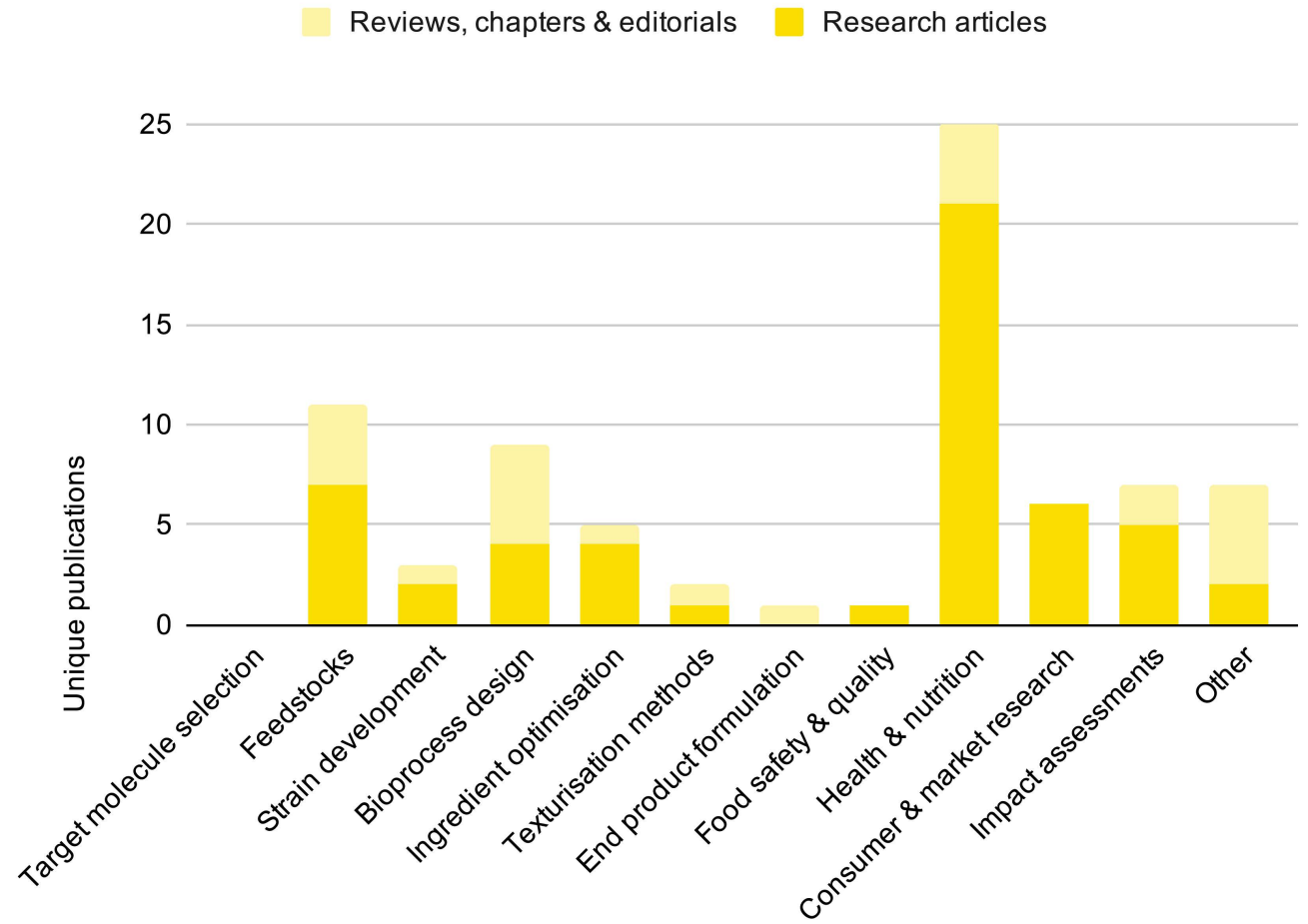
The fermentation portion of the CARMA and Microbial Foods Hub research centres are shown here, distributed across the relevant categories.



Fermentation publications: research categories

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

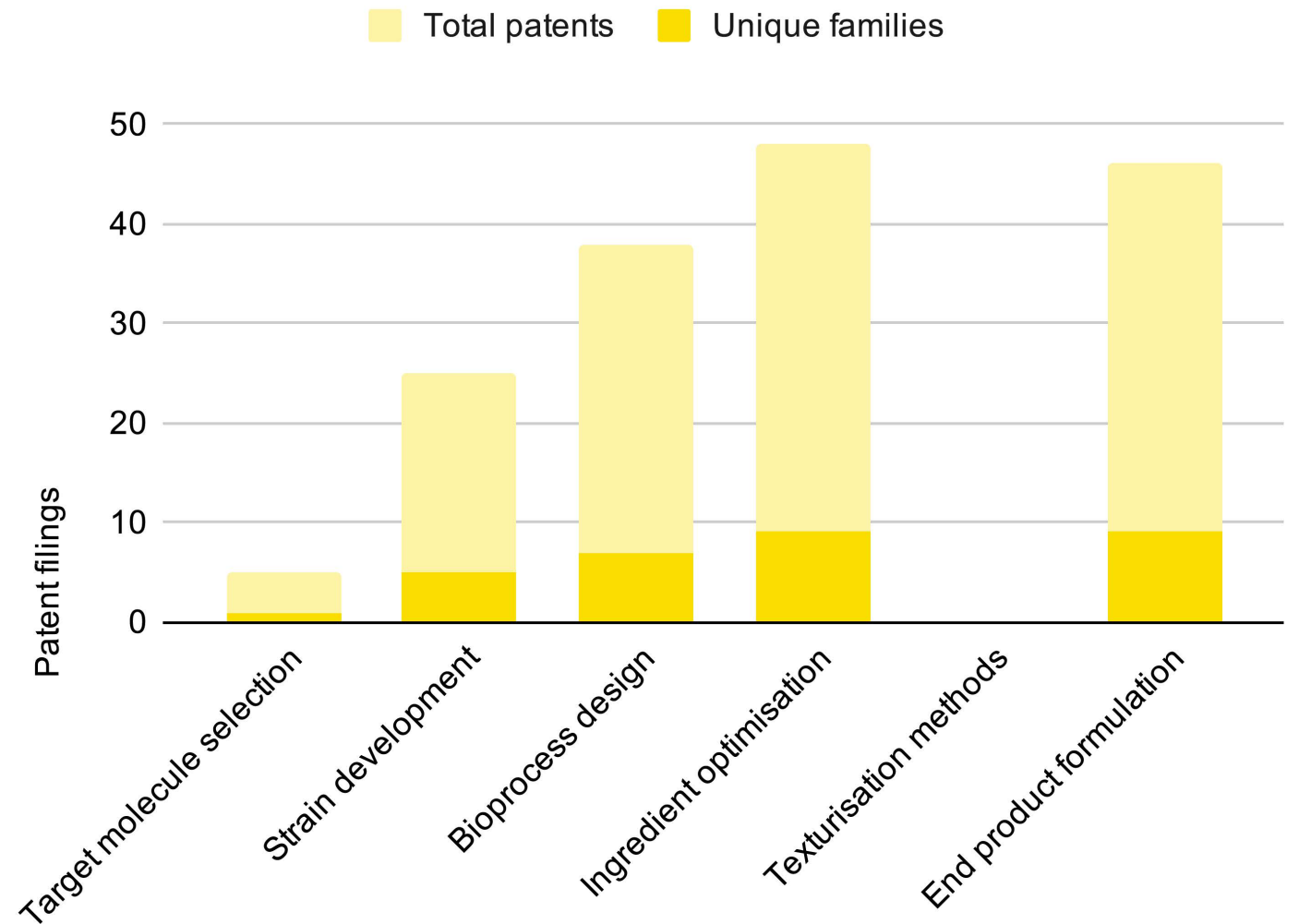
Health & nutrition is the most common category, with 32% of all publications, followed by feedstocks on 14%.



Fermentation patents: research categories

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

UK innovators filed patent applications on a range of research categories in fermentation, with ingredient optimisation (30% of all filings) and end product formulation (28%) the most common.



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 the UK.

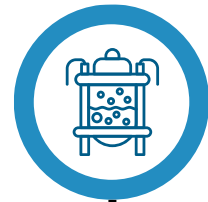


Research categories: Cultivated



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.



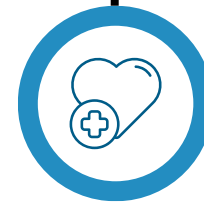
Food safety and quality

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



Scaffolding

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



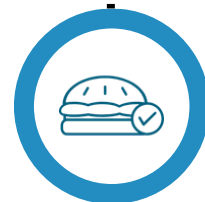
Health and nutrition

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



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.



End product formulation

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

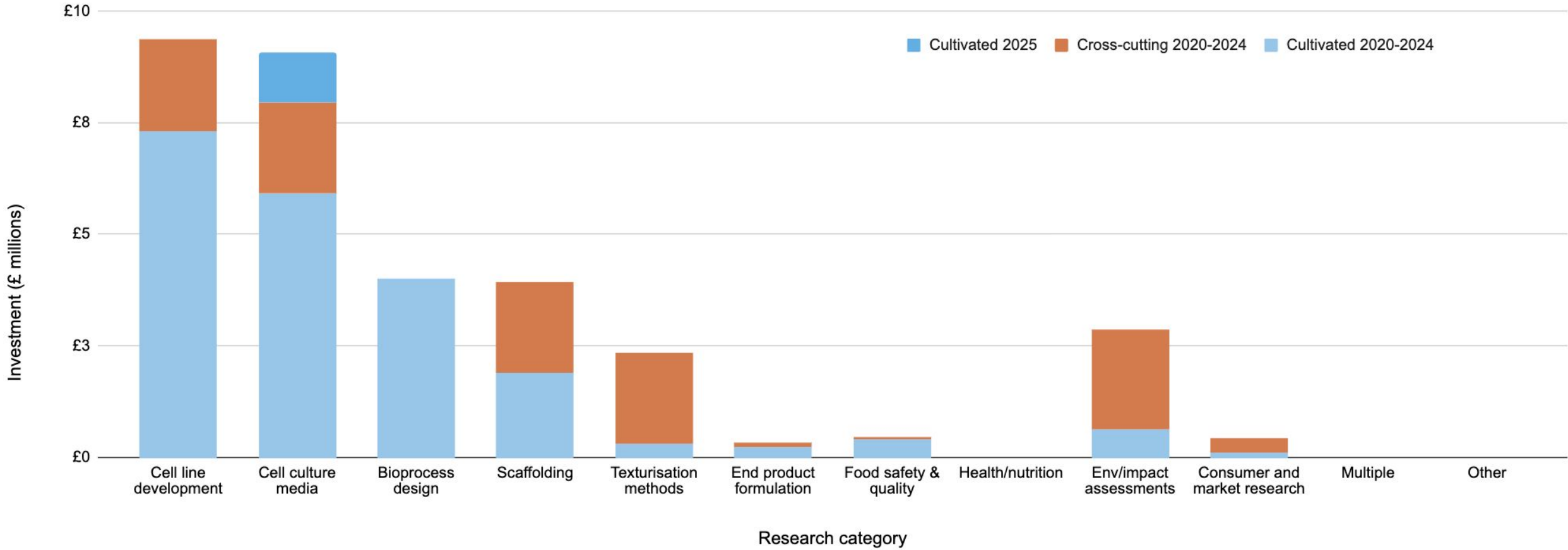


Impact assessments

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

UK cultivated deep dive: research categories

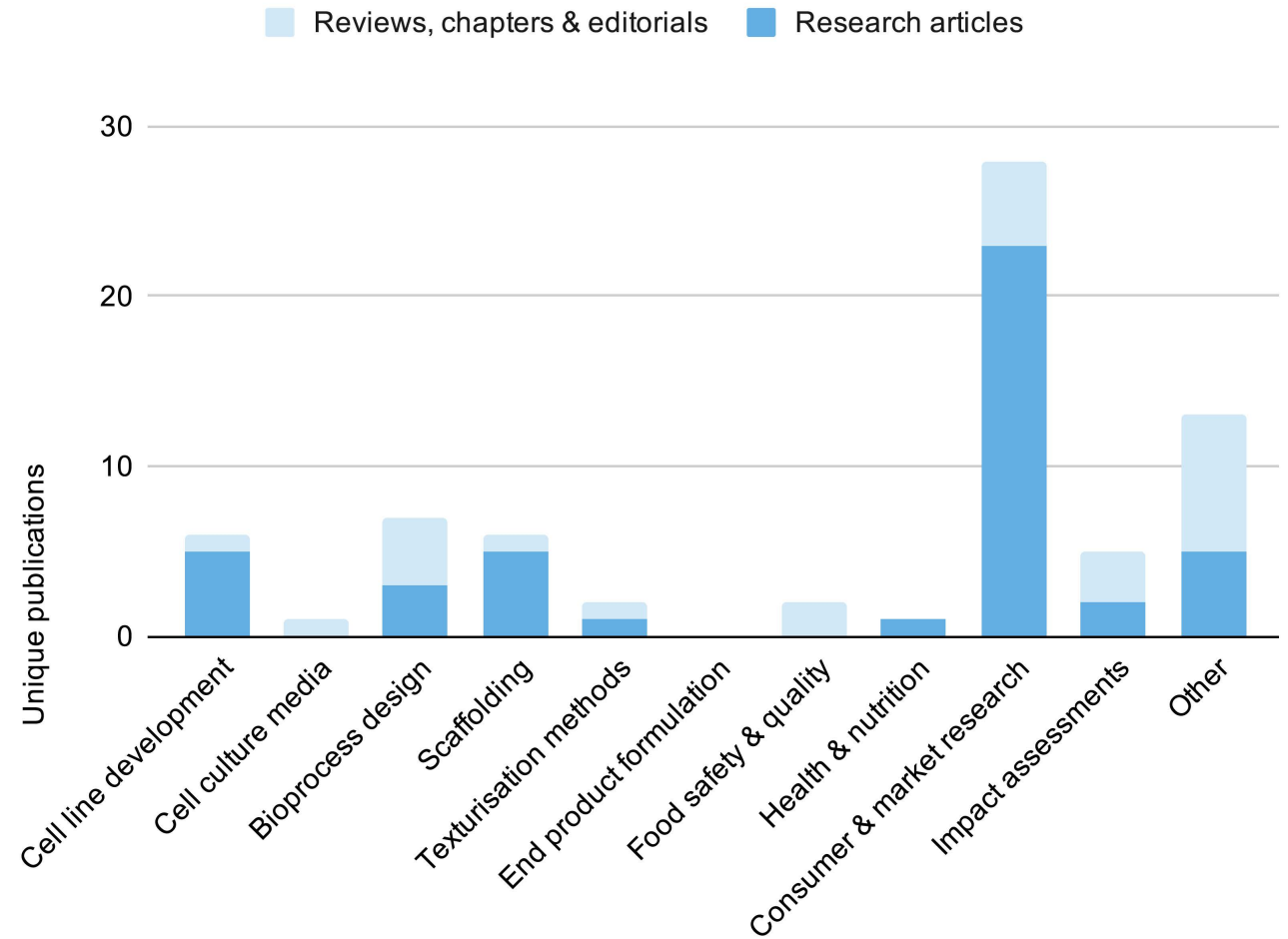
Cultivated meat investment from the UK, broken down by research category, 2020-2025, showing cross-cutting investments where relevant. The CARMA research centre is shown as cross-cutting, and distributed across the relevant categories.



Cultivated publications: research categories

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

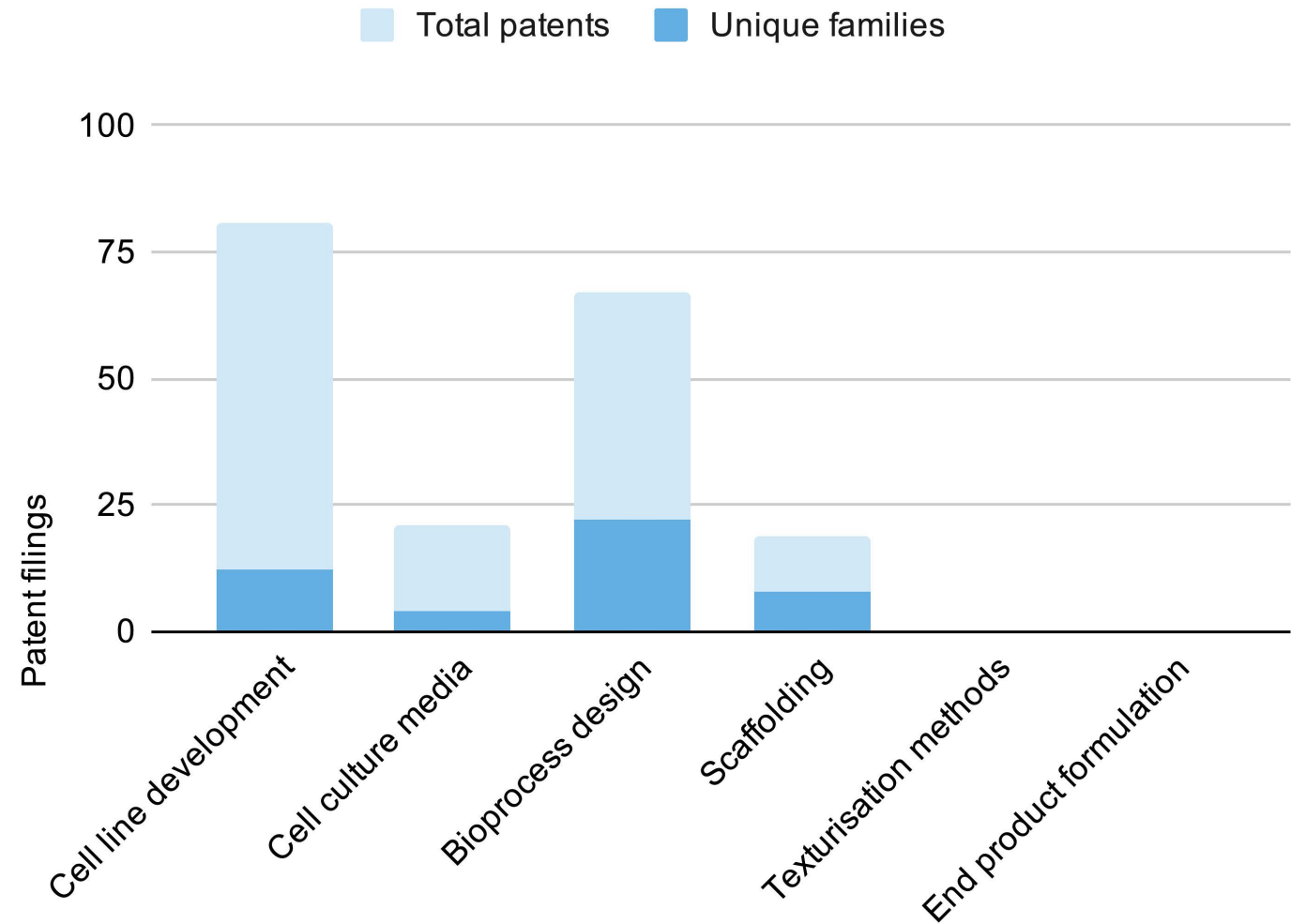
39% of cultivated meat and seafood publications were assigned to the consumer & market research category, while a further 18% were not assigned to any category.



Cultivated patents: research categories

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

UK innovators mostly filed patents on cell line development (43% of all filings) and bioprocess design (36%).



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>).

Time period

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

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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.

