gfi Europe

Summary: **sustainable proteins in Germany**

Exploring recent developments surrounding plant-based, cultivated and fermentation-made proteins

May 2023

At least **90 companies are** currently working on plant-based, cultivated and fermentation-made food products in Germany. In addition to promising startups, **established industry players increasingly recognise their potential** and have expanded their portfolios to include plant-based options, invested in startups or supplied manufacturing capacity and ingredients for the sector.

Last year, German sustainable protein companies producing meat, seafood, eggs and dairy products **attracted private investment of €53 million**. In 2022, the German sustainable protein sector grew more through established food company investments and partnerships than from venture capital.

Worth a total of €1.9 billion in 2022, Germany has **by far the largest market for plant-based options** in Europe and saw 11% growth last year despite difficult market conditions. Sales of plant-based meat grew by 7% and plant-based milk by 13%. Inflation had less of an impact on plant-based options in 2022 than their conventional counterparts.

People in Germany are open to sustainable proteins: 41% of Germans say they eat plant-based meat at least monthly, and **25% say they intend to eat more plant-based meat in the future.** At the same time, 57% of Germans say they would buy cultivated meat – which grows to 82% among under-25s.

Germany has more than 400 universities and a unique network of non-university research institutes. Of these, a few universities and a number of non-university research institutes are currently specialising in sustainable proteins. Since September 2022, the Technical University of Munich has had the **world's first chair** for cultivated meat and precision fermentation.

The German coalition agreement commits to sustainable proteins, but does not lay out how this will be implemented. GFI Europe proposes **15 policy measures** that could decisively advance this commitment. These would enable Germany to catch up with countries such as Israel, Singapore, the United States, the Netherlands and Denmark, which are proactively shaping the sector politically.

Market development in Germany

For several years, plant-based products have been on the market in Germany and other parts of the world, attempting to replicate the taste, texture and cooking characteristics of conventional animal-based foods. As consumer demand for more sustainable choices has grown, so too has the variety and quality of available options, which is reflected in both rising production volumes and fast growth in sales figures. While the market for plant-based products in Germany is growing at double-digit rates, cultivated meat and the vast majority of products from modern fermentation processes are not yet approved for sale in the European Union.

- **The global market for plant-based products has continued to grow:**
  The global market for plant-based meat and seafood grew by around 8% in 2022, while the global market for plant-based dairy products grew by around 7%. Overall, the global market for plant-based options was worth around $27.8 billion in 2022.
- **The value of plant-based retail sales in Germany has grown by double digits:**
  At €1.9 billion, Germany is by far the largest market for plant-based products in Europe – followed by the UK, Italy, Spain and France. Despite a challenging macroeconomic environment, the overall market for plant-based foods grew by 11% in 2022, and the market has grown by 42% overall since 2020.
- **The market for plant-based options grew in almost all categories:**
  Sales of plant-based meat grew by 7% to €643 million and sales of plant-based milk by 13% to €552 million. In fact, sales grew in almost every category last year — with seafood sales up by 52%. Plant-based yoghurt was the only category where sales slightly declined.
- **People spent €23 per capita on plant-based options:**
  In 2022, people in Germany spent an average of €23 on plant-based products, placing them second among European countries. Of this total, €7.70 was spent on plant-based meat and €6.60 on plant-based milk. Only the Dutch spent more on plant-based options, at €23.50 per capita.
- **The plant-based sector largely escaped inflation:**
  In Germany, inflation had a smaller impact on plant-based options in 2022 than on their conventional counterparts. For example, the average price of plant-based meat increased by 1% in 2022, while the price of conventional meat increased by 15% on average. The average price per unit of plant-based milk decreased by 1.5% in 2022, while the average price per unit of cow's milk increased by 19%. Average prices also decreased for plant-based seafood (-6%), plant-based cheese (-5%) and plant-based ice cream (-4%).

- **Unit sales of conventional animal-based products have been shrinking since 2020:**
  While unit sales grew significantly in the plant-based sector in almost all categories, unit sales of their animal-based counterparts declined across the board. Between 2020 and 2022, plant-based meat unit sales increased by 41%, while unit sales of animal-based meat declined by 13%. More units of plant-based milk and cheese were also sold, while sales of their animal-based counterparts declined.

- **More plant-based meat is being produced in Germany:**
  The growing demand for plant-based meat and sausage products is also reflected in the increase in production: 109,800 tonnes of plant-based meat, worth €537 million, was produced in Germany in 2022, representing a 12% increase compared to 2021 and 82% growth compared to 2019.

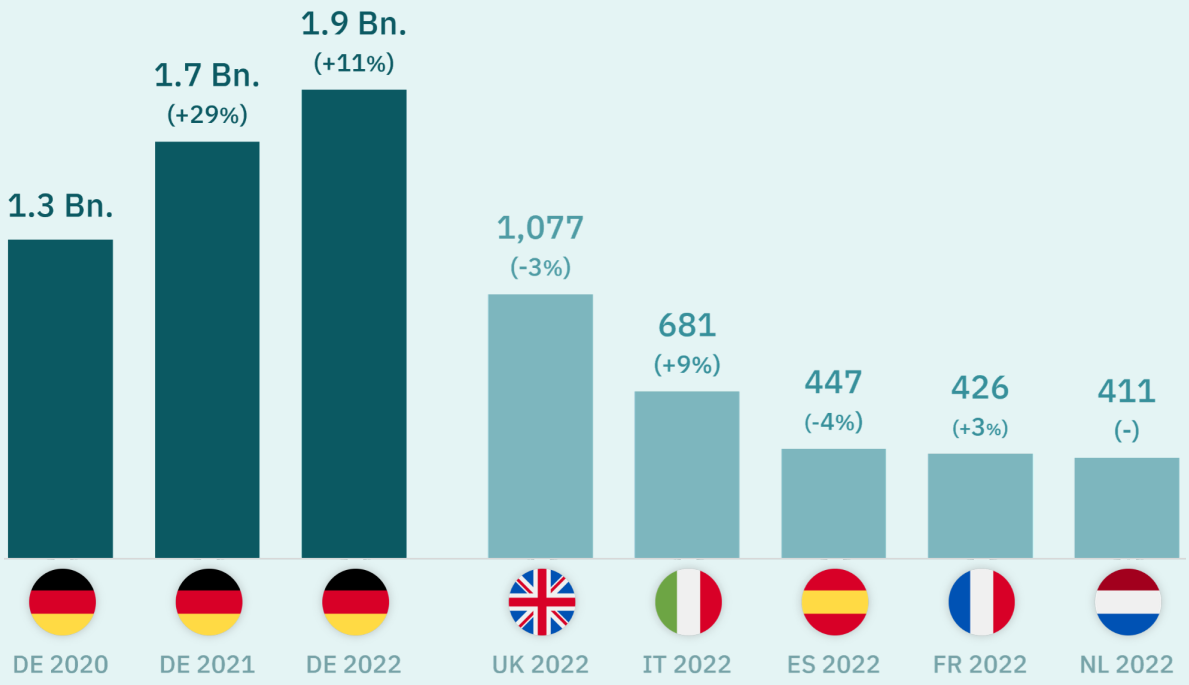
- **Consumption of animal products is declining in Germany:**
  According to the Federal Agency for Agriculture and Food (BLE), the consumption of animal-based foods in Germany continues to decline: meat consumption has fallen by around 8% to 52kg per person in 2022. Likewise, consumption of cow's milk has fallen by 6% to 46kg and of cheese by 3% to 25kg.

- **People in Germany are open to sustainable options:**
  According to a representative survey, 41% of people in Germany say they eat plant-based meat at least monthly, and 25% say they want to eat plant-based meat more often in the future. At the same time, 57% of people in Germany say they would buy cultivated meat if it was available – rising to 82% among under-25s.

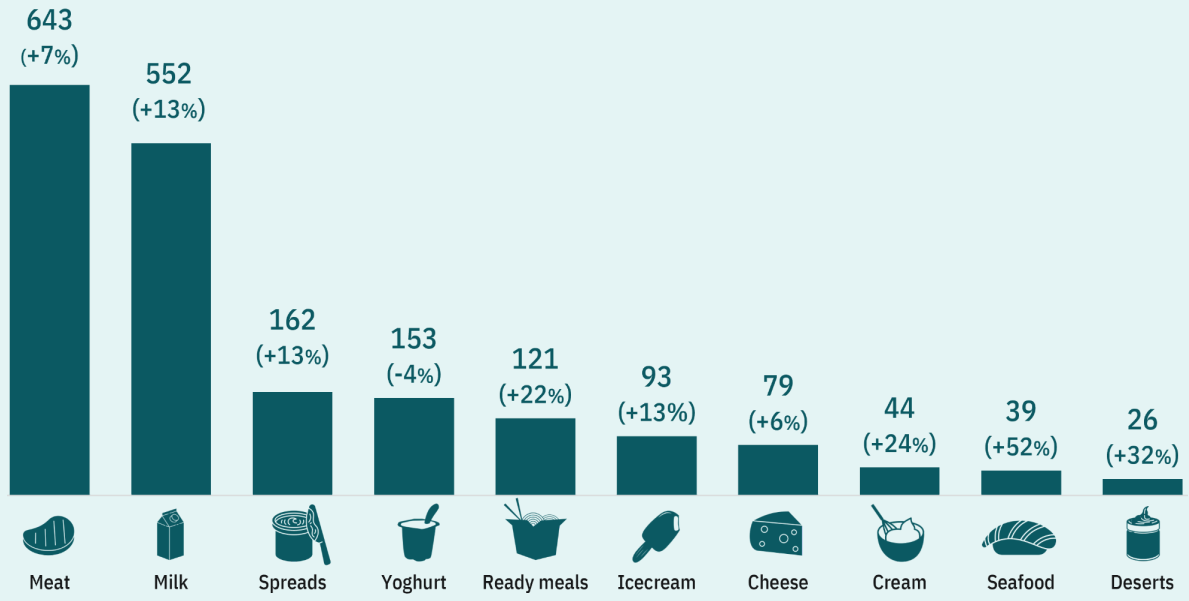
A detailed analysis of the market development of plant-based options in the German retail sector can be found in the **↗full version of the report** (German language). An overview of the broader European market, including national breakdowns, is provided by GFI's **↗Market insights on European plant-based sales 2020–2022**.

Market development in the plant-based sector

Sales of plant-based foods in the European retail sector *(in million euros)*



Value of sales in Germany by plant-based category *(in million euros)*



Source: Analysis of NielsenIQ data by GFI Europe, April 2023

Commercial landscape for sustainable proteins

Germany has a diverse commercial landscape in the field of sustainable proteins, ranging from DAX-listed corporations and traditional medium-sized companies to innovative startups. German industry plays a particularly prominent role in the development of the industry as a whole, which extends far beyond the German sustainable protein ecosystem.

- **Around 1,500 companies worldwide are working exclusively on sustainable proteins:**
  At least 1,150 companies worldwide produce plant-based versions of conventional animal products, including both innovative startups and established companies in the food industry. Additionally, there are over 156 cultivated meat and seafood companies, and more than 136 companies working on innovative fermentation processes.

- **The number of global sustainable protein companies continues to rise:**
  In 2022, at least 30 new plant-based companies, 19 new cultivated meat companies and 15 new fermentation companies were founded worldwide. However, these figures are almost certainly significantly understated, as it is common for companies to start in 'stealth mode', only announcing themselves publicly once they have reached an initial milestone.

- **Germany's diverse and innovative commercial landscape:**
  Germany has many high-performance companies in the plant-based sector and several cultivation and fermentation startups, some of which are pursuing approaches that are unique in Europe. Especially in the field of fermentation, Germany is very strongly positioned, with the third highest number of startups globally, behind only the United States (42 companies) and Israel (11 companies). Germany is therefore on its way to becoming a global powerhouse in this emerging category.

- **New startups in Germany in all three pillars:**
  New startups were founded in Germany in 2022 in all pillars of the sustainable protein space. Examples in the plant-based space include Project Eaden (plant-based meat), Ordinary Seafood (plant-based seafood) and Blue Farm (plant-based milk). In fermentation, Esencia Foods and Nosh Biofoods (both biomass fermentation) were founded, and in the cultivation space, Cultimate Foods emerged, working on cultivated fat.

- **Established companies in the food industry are expanding their portfolios:**
  In recent years, the commercial landscape has grown to include many companies from the established food industry that are expanding their portfolios to include plant-based products and investing in cultivated meat or fermentation in Germany, including Rügenwalder Mühle, the PHW Group and Hochland. The most significant example of this in 2022 was the transition

of the meat company The Family Butchers into the broad-based protein company InFamily Foods, which now sells plant-based products under the Billie Green brand in addition to conventional meat, and is also active in cultivated meat and fermentation.

- **German industry is the backbone of the emerging sustainable protein sector:**
  The true importance of the ecosystem in the DACH region is measured not only by the companies working on end products but also by the industry companies and service providers in the whole value chain. In this area, Germany can fully play to its strengths as a global market leader for industry and innovation. The spectrum of companies that position themselves in the market in the B2B area for cell cultivation and fermentation ranges from DAX corporations (e.g. Merck) to medium-sized companies (e.g. Sartorius and The Cultivated B) and startups. The same applies to the plant-based sector, where numerous suppliers from the industry offer equipment and services for the sector (e.g. Planteneers).

- **€53 million of venture capital investment and new partnerships:**
  Last year, German sustainable protein companies attracted €53 million in private investment, with Mushlabs and Greenforce accounting for the largest rounds. In 2022, the German sector grew less through venture capital than through investments and partnerships from established food and industry companies.

- **The product range is becoming broader and more innovative:**
  For a long time, the plant-based sector has focused on relatively simple products such as burger patties and nuggets. In 2022, however, products with more complex textures also entered the market, including plant-based steaks and fillets in the meat sector, and plant-based prawns and salmon fillets in the seafood sector. Additionally, in 2022 the first cultivated meat products from German startups were revealed, with a cultivated schnitzel from Alife Foods, and the unveiling by Bluu Seafood of their cultivated fish products, representing the first of their kind in Europe.

For a detailed description of the commercial landscape for sustainable proteins in Germany, please see the **↗full version of the report** (German language). For more information on the global plant-based, cultivation and fermentation ecosystem, please refer to GFI's **↗State of the Industry Reports.**

The German sustainable protein sector

A selection of small, medium-sized and large companies in German-speaking countries

Plantbased-brands from the DACH region

Suppliers from industry and service providers:

Brands from outside DACH

German retailers' private labels

Cultivated meat and seafood and fermentation in the DACH region

Suppliers from industry and service providers:

Associations and nonprofits

As of May 2023

No claim
of exhaustivity

Scientific landscape for sustainable proteins

Germany has one of the most efficient and productive research and innovation systems in the world. This means that Germany is fundamentally very well positioned to play a leading role across the entire spectrum of research into sustainable proteins – from basic research to implementation of new technology in practice, and scaling up production. A wide range of talented researchers and groups across Germany are working to pioneer sustainable protein options from plants, cultivation and fermentation. However, relative to Germany's status as a global leader in science and research, many opportunities currently remain untapped.

- **At least 200 researchers are active on sustainable proteins in Germany:**
  A GFI analysis of the Scopus database shows that about 200 researchers in Germany have published on sustainable proteins since 2006, of whom about 40 are working closely on the topic. This makes Germany a European leader in terms of the number of publications on this topic, alongside the UK and the Netherlands. The number of researchers in this field is probably larger, as not all researchers end up publishing their results.

- **World's first chair for cellular agriculture at the TU Munich:**
  With more than 400 universities, the potential for research on sustainable proteins and the training of qualified specialists in Germany is huge. Some universities are already conducting in-depth research on sustainable proteins, both on technical and economic, social and regulatory aspects. One outstanding development in 2022 was the establishment of the world's first chair for cellular agriculture – i.e. cultivated meat and precision fermentation – at the Technical University of Munich. Nevertheless, sustainable proteins have so far been a niche area at most universities, and there is a lot of room for growth.

- **Research at non-university research institutions:**
  A special feature of the German innovation system is the network of prestigious non-university research institutions – for example, the four major research organisations jointly funded by the federal and state governments (Fraunhofer, Helmholtz, Leibniz, Max Planck). A number of institutes are already working intensively on sustainable proteins, including a number of Fraunhofer Institutes (including the Fraunhofer IVV and the Fraunhofer IME), the German Institute of Food Technologies (DIL) and the Karlsruhe Institute of Technology (KIT). Within the framework of BMEL departmental research, the Max Rubner Institute also conducts research on certain aspects of sustainable proteins.

- **Studies point to the high potential for climate protection:**
  In 2022, new studies further underlined the importance of diversifying our protein sources for climate, environmental and public health protection. On the potential of meat from biomass fermentation, the Potsdam Institute for Climate Impact Research 2022 published an **↗analysis** that concludes that global deforestation could be halved if just 20% of per capita beef consumption were to be covered by sustainable products from the fermentation of mushroom cultures in the future. CE Delft's 2021 study on the ecological footprint of cultivated meat was updated in 2022 and published as a **↗peer-reviewed study** in early 2023. According to this study, cultivated meat could cause up to 92% less emissions than meat from farmed animals, and require up to 90% less land when produced at scale using renewable energy.

- **A report to the Bundestag emphasises the role of public research funding:**
  In mid-2022, the German Bundestag commissioned the Office of Technology Assessment at the German Bundestag (TAB) to submit a report on cultivated meat. The **↗report**, released in early 2023, describes the potential of cultivated meat for climate, environmental and health protection and identifies the need for political action with regard to the expansion of public research funding and the design of approval requirements and labelling obligations.

- **GFI funds research on sustainable and cost-effective nutrient growth media:**
  GFI Europe and EIT Food called on companies and research institutes in June 2022 to submit practicable ways to further reduce the cost of growth media so that cultivated meat can become affordable for everyone. Researchers from 14 countries submitted 25 project proposals. Of these proposals, four projects each received a €100,000 grant. One of the grantees was German pharmaceutical company LenioBio, founded in Düsseldorf in 2016.

- **GFI university groups in Germany:**
  To anchor sustainable proteins more firmly in the university landscape, in 2020, GFI launched the Alt Protein Project. The initiative supports students in founding groups to promote sustainable protein science and education at their universities. In Germany, student groups at four universities have so far joined the initiative: the University of Bayreuth-Kulmbach, the Technical University of Berlin, the Technical University of Regensburg, and the University of Hohenheim as part of the EIT Food Alt Protein Project Chapter.

A detailed description of the German research landscape in the field of sustainable proteins can be found in the **↗full version of the report** (in German). Current information on the state of research in the areas of plant-based, cultivated meat and fermentation can be found in the respective **↗State of the Industry Reports** from GFI. The peer-reviewed **↗CE Delft study can be found here**.

Research landscape for sustainable proteins

Selected universities and research institutes working on sustainable proteins:

No claim of exhaustivity

Policy considerations

Germany has all the prerequisites to play a leading role in shaping the protein transition and in becoming an innovation leader in this nascent field. Achieving this promises a significant share of the sector's future growth flowing into the German economy, while also advancing political goals in the areas of climate, environment, public health protection and animal welfare.

But private investment alone is not enough to reap the full potential of sustainable proteins. To achieve this, support is also sorely needed from policymakers, particularly in the form of public investment from federal and state governments into R&D and infrastructure, the creation of a reliable path to market for novel food products, and the levelling of the playing field for sustainable options.

- **Leading countries around the world are beginning to actively shape the protein transition:** More and more countries are recognising the need to shape the sustainable protein sector and advance it through research and infrastructure funding. In 2022, there were numerous initiatives by global leaders in this regard. The US Department of Agriculture is funding a research centre for cultivated meat, and US President Joe Biden has issued an executive order to push biotechnology innovations including sustainable proteins. In China, the government has included cultivated meat in its five-year agricultural plan and is also investing in sustainable proteins more broadly. Singapore and Israel began strategically developing the sector several years ago and are now leaders in development and commercialisation. In Israel, alternative proteins were declared one of Israel's top five research priorities in 2022 by the National Council for Civilian Research and Development. Among other things, the government earmarked $18 million to a cultivated meat research consortium, and $14 million for fermentation infrastructure.
- **Germany's neighbours are investing in sustainable proteins:** Other European nations are increasingly investing in sustainable proteins. The Danish Government announced in October 2021 that it would invest more than 1.25 billion kroner (€168 million) in promoting plant-based foods as part of a climate package for the food and agriculture sector. In the Netherlands, the government has allocated €60 million under the National Growth Fund to build an ecosystem for cultivated meat and precision fermentation. Other examples of funding for research and development in this area can also be found in the UK, Spain, Belgium and Norway, as well as at the EU level through the Horizon Europe research programme.

- **The coalition agreement in Germany mentions sustainable proteins:**
  In Germany, SPD, Bündnis 90/Die Grünen and FDP have committed in their coalition agreement to strengthen plant-based options and to advocate for the approval of new, sustainable protein sources in the EU. This was the first time that the goal of the diversification of our protein supply was anchored in a German coalition agreement at the federal level. However, as of early 2023, no major measures to implement this goal have yet been announced.

- **Germany is falling behind in public funding of the field:**
  Compared to benchmarks from other countries – especially in 2022 – Germany risks falling behind. Although the federal and state governments have launched some projects to promote sustainable proteins in recent years, the level of investment is comparatively low. Some positive examples do exist, however: in the business area of the Federal Ministry of Education and Research (BMBF), the Cellzero Meat research network has received €1.2 million in investment since 2022 to advance sustainable methods for cultivating meat. In addition, there are several projects from the BMBF-funded innovation space NewFoodSystems. In the business area of the Federal Ministry for Economic Affairs and Climate Action (BMWK), the Industrial Bioeconomy funding programme has been in place since 2021. Intended to help near-market projects scale up, it has invested €1.76 million in sustainable protein projects, particularly in the area of fermentation. In the business area of the Federal Ministry of Food and Agriculture, a research call was published at the end of 2021 to fund projects on sustainable proteins by small and medium-sized enterprises, but the evaluation of this call has not yet been completed.

- **GFI proposes policy recommendations for Germany:**
  GFI Europe proposes 15 measures in five fields of action through which Germany can catch up with other countries in shaping the sector. Germany will only be able to leverage the full potential of sustainable proteins for climate, environmental and public health protection and animal welfare if policymakers invest in the protein transition – as they have done before with energy and transport. Through forward-looking policy initiatives in the fields of strategy, research funding, regulation, infrastructure development and fair competition, Germany can move to the forefront of this nascent industry and make a major contribution to tackling societal problems such as the climate crisis.

For a detailed description of the benefits of sustainable proteins and an explanation of the 15 proposed policies, see the **↗full version of the report** (in German). Examples of policy support initiatives from around the world can be found in GFI's global **↗State of Global Policy Report**.

Need for political action in Germany

The Good Food Institute Europe proposes five fields of action in which sustainable proteins can be advanced in Germany in order to maximise their societal benefits:

Field of action A – Government strategy:
The German Government should make sustainable proteins a central building block in Germany's sustainability and innovation strategies. It should develop a comprehensive roadmap for the path to market for sustainable proteins that formulates concrete goals for the year 2030 and backs these up with political measures.

Field of action B – Expansion of research funding:
The federal and state governments should provide more public funding for open-access research in the field of sustainable proteins to accelerate the protein transition and to ensure that plant-based, cultivated and fermentation-made foods can realise their full potential for climate, environmental and public health protection, and animal welfare.

Field of action C – Evidence-based and efficient regulation:
The federal government should ensure there is solid and efficient implementation of the regulatory approval process for novel foods at the European level in order to strengthen consumer confidence. Where possibilities evolve to make the process more efficient while maintaining the same high safety standards, these should be implemented.

Field of action D – Securing infrastructure investments:
The federal and state governments should financially secure infrastructure investments in sustainable proteins to help the sector scale up. Policymakers can support companies in the critical scaling phase by reducing investment risk – for example, through loan guarantees, incentives for minimum purchase contracts, and public subsidies.

Field of action E – Level playing field:
Policymakers should create fair conditions of competition. In particular, plant-based milk should no longer be disadvantaged in terms of VAT. Furthermore, it should be allowed to use familiar denominations and descriptions so that consumers know what to expect in terms of taste, texture and cooking properties.

Further information

Full Report: Alternative Proteins in Germany

Comprehensive review of the German ecosystem for sustainable proteins, both in terms of market development and the political framework in Germany. The full report is in German language only.

The full document covers:

- Market development in the plant-based sector
- Commercial landscape
- Investments and investors
- Scientific landscape
- Surveys on the acceptance of alternative products
- Policy recommendations for Germany
- Voices of experts from the sector

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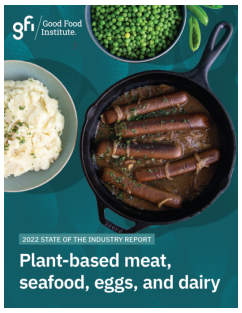

State of the Industry Report: plant-based

In-depth insights into global developments around plant-based options.

↗ **Download**

State of the Industry Report: cultivated meat

In-depth insights into global developments around cultivated meat and seafood.

↗ **Download**

State of the Industry Report: fermentation

In-depth insights into global developments around modern fermentation processes.

↗ **Download**

Imprint and contact

About the the Good Food Institute Europe

The Good Food Institute Europe is an international NGO helping to build a more sustainable, secure and just food system by transforming meat production.
We work with scientists, businesses and policymakers to advance plant-based and cultivated meat – making them delicious, affordable and accessible across Europe.
By making meat from plants and cultivating it from cells, we can reduce the environmental impact of our food system and feed more people with fewer resources.
GFI Europe is powered by philanthropy.

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