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2026 STATE OF THE INDUSTRY:

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# Fermentation

for meat, seafood, eggs, dairy  
and ingredients



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## Acknowledgments

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The cover image is courtesy of Millow.

# About the series

The State of the Industry report series is GFI's annual deep dive into the rapidly evolving alternative protein landscape. This flagship series provides a global snapshot of the industry, synthesizing company landscape and product trends, investment and sales data, new scientific advancements, and public investment and regulatory updates that highlight industry progress.

Tracking the technological and adoption readiness of the cultivated, plant-based, and fermentation sectors is a useful method to evaluate progress toward competing on price, taste, and availability with conventional meat. Readiness can be determined by assessing the progress, challenges, and overall risk across categories such as scientific feasibility, engineering viability, innovation capacity, value proposition, market acceptance, and license to operate. This series summarizes the current state of these factors using real-world developments from the past year.

Access the full suite of 2026 State of the Industry reports [here](#).

## Important notes

- All figures are expressed in U.S. dollars where the \$ symbol is used. Other global currencies are clearly marked.
- The Good Food Institute is not a licensed investment or financial advisor, and nothing in this report is intended or should be construed as investment advice.
- Please note that recently published investment figures may differ from prior figures published by GFI as we and Net Zero Insights continually work to improve our dataset and reporting methodology.
- An update to the report titles: In past years, GFI titled each State of the Industry report with the year covered in report content. Starting in 2026, the report titles now reflect the publication year (content timeframe remains the same).

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# Editor's note

Fermentation—a process used to make food for millennia—is an emerging production method of choice for those striving to satisfy growing demand for meat in new, more sustainable ways.

Among those striving are governments, companies, and researchers who recognize the need to diversify protein production on a planet being pushed to its limits. If we are to meet growing global demand for meat while addressing some of the world's biggest challenges within the next two critical decades, we can't simply ramp up business-as-usual meat production. While multiple interventions will be needed, fermentation-derived meat—as well as cultivated and plant-based meat—is an essential globally scalable solution.

Over the last decade, fermentation-enabled protein production has evolved rapidly, from a niche concept to a global food solution deeply integrated with plant-based and cultivated meat innovation. In 2025, the field experienced both challenges and breakthroughs:

- A handful of high-profile closures and restructurings drew headlines asking questions about scale-up pathways as regulatory wins continued to quietly rack up. Several companies achieved regulatory approval in the United States and China.
- While the tightening funding environment proved challenging, significant investments were made to support commercialization and market rollout.
- Questions about profitability surfaced, while new commercial locations increased production capacity, incumbents utilized partnerships to de-risk scale up, and cost modeling clarified the path to price parity.

**Then and now:** Ten short years ago, the milestones of today in fermentation-derived proteins may have seemed far-fetched. It can be grounding to stop and ask: how far have we come in a decade?

In 2015, fermentation was mainly used to make inputs and ingredients for food and industrial products, like enzymes and additives. By 2025, it was producing bioidentical animal proteins and functional ingredients like vitamins, flavors, and fats. In the past year, corporations and startups partnered to advance ingredient, process, and product innovation; new facilities opened around the world to pilot and cross-pollinate techniques; several mycelium-based products launched in the United States and Europe; and fermentation increasingly featured in public investments aimed at strengthening the bioeconomy.

Today, fermentation-derived innovators focused on meat, seafood, eggs, dairy, and ingredients are zeroing in on the fundamentals of production—bringing down costs, optimizing taste and texture, and minimizing environmental impacts.

And focus we must. Evidence that existing meat production exacerbates global challenges—from climate change to pandemic risk—is mounting. In December 2025, the UN Environment Programme published the Global Environment Outlook, 7th Edition. The report notes that alternative proteins have the potential to pay significant dividends for our environment.

But we're not in the clear yet. This report, Fermentation for meat, seafood, eggs, dairy, and ingredients, details year-over-year funding declines, technical and cost hurdles, and regulatory challenges.

But the following pages also shine a light on the less visible progress: research collaborations, publicly funded infrastructure, and product launches like whole-cut meats with improved texture, reflecting an increasingly diversified and expanding sector.

At GFI, a nonprofit funded by philanthropy, we're committed to charting a path forward that feeds growing global demand for meat in restorative, resilient ways. Our annual State of the Industry series—including this report—equips food system stakeholders with knowledge of the innovations and developments that got us further down that path in 2025.

Thank you to all those who are in this work alongside us, and as such, helping to build a thriving world, fed sustainably.



3D-printed salmon filet made from mycoprotein. Photo credit: Reno Foods GmbH

# Executive summary

In 2025, the fermentation-enabled protein and ingredients sector experienced a mix of successes and struggles across the commercial, investment, technology, policy, and regulatory landscape. Major themes:

- New product launches, innovation, and regulatory wins.** The sector saw new product launches across meat, dairy, and ingredients, plus regulatory milestones in China and the United States. In 2025, more than 163 specialized companies and a growing number of research institutions kept innovating and optimizing fermentation-derived products so consumers can enjoy the foods they love made with a lighter footprint.
- The funding environment tightened.** Fermentation funding was down year-over-year. Companies operating primarily in the fermentation ecosystem raised \$357 million in 2025, according to GFI analysis of data from Net Zero Insights (down from \$632 million in 2024).
- Production quantities are increasing and food biomanufacturing is scaling.** Facilities opened around the world to pilot, accelerate, and cross-pollinate techniques. New commercial-scale locations opened in Brazil, Canada, China, Sweden, and the United Kingdom. Several companies validated circular feedstock strategies under commercially relevant conditions.
- Public investment for fermentation-related research and commercialization is expanding.** Governments concerned with supply chain constraints and product shortages are recognizing precision fermentation for its ability to produce specific animal proteins, like those found in dairy and eggs. Many governments—in China, the EU, India, and more—implemented wide-ranging biotechnology plans, recognizing the potential benefits to the economy, food system, and national security.

	<i>Bright spot</i>	<i>Challenge</i>
<b>Commercial landscape</b>	<p><b>Harnessing knowledge from large companies for the benefit of startups:</b> Partnerships with key dairy, meat, fungi, grain, and yeast makers are enabling synergies and helping grow fermentation ingredient, process, and product pipelines. In this space, startups benefit from corporations’ long-time expertise in industries such as dairy, and together they build on existing knowledge to <u>maximize</u> viability and efficiency.</p>	<p><b>Product availability varies across different types of fermentation-derived products:</b> Products made from biomass fermentation are more widely available than products made from precision fermentation.</p>

## Bright spot

## Challenge

### Investments

**Europe's fermentation ecosystem gains momentum:** Europe is positioning itself as a strategic hub for fermentation and the broader bioeconomy by leveraging public and industry investment in infrastructure, production assets, and regulatory and permitting pathways.

**All eyes on market performance:** A handful of high-profile closures and restructurings in 2025 tested assumptions around timelines, scale-up pathways, and downside risks. These sharpened investors' focus on unit economics, sustainable demand signals, and credible paths to profitability.

### Science and technology

#### Scientific feasibility

**Advancing mycoprotein strains to improve productivity and quality:** Efforts to improve the longstanding mycoprotein species used in **Quorn** products accelerated in 2025. A research collaboration between **NIAB** and **Marlow Foods** (Quorn's parent company) has identified important steps toward improved strain stability, productivity, and quality at scale.

**Data standardization is needed:** Bioprocesses could be ripe for AI/machine learning (ML) process optimization. However, data standardization is needed to enable cross-sector developments over siloed in-house solutions.

#### Engineering viability

**Continuous fermentation systems mature:** A major signal this year came from **Pow.Bio**, in collaboration with **Bühler**, who demonstrated scalable, transferable continuous fermentation of high-value dairy proteins at 3,000-liter scale with **ATV Technologies**. The scale up achieved over threefold productivity gains and a 50 percent reduction in costs, enabled by Pow.Bio's patent-pending continuous process technology and ML-based bioprocess control platform.

**Further precision fermentation modeling is needed:** Despite progress in benchmarking production costs, further precision fermentation modeling is needed to assess cost-reduction strategies, such as continuous processes for protein production.

	Bright spot	Challenge
<i>Innovation capacity</i>	<p><b>Expanding publicly funded infrastructure:</b> Newly launched and expanding research centers and facilities are strengthening translational, scalable innovation. Publicly funded infrastructure plays a key role in de-risking process development and scale up for fermentation-derived products.</p>	<p><b>IP disputes signal commercialization risk:</b> Recent years have seen multiple high-profile disputes in fermentation-derived products. Often, prolonged legal proceedings coincided with major business disruption or even company closures. While company exits occur in competitive markets, protracted IP conflicts around foundational technologies risk slowing sector-wide scaling.</p>
<b>Government and regulation</b>	<p><b>Legislation to support innovative food products:</b> In December 2025, South Korea enacted the <u>Food Tech Industry Promotion Act</u>, establishing a legal and administrative framework for the Ministry of Agriculture, Food, and Rural Affairs (MAFRA) to support innovative food products, including fermentation-enabled products. The Act empowers MAFRA to provide direct support to businesses, offer startup assistance, facilitate access to research facilities and equipment, foster market entry, and enable co-navigation of regulatory processes.</p>	<p><b>Banning meat-related terms for alternative proteins in Europe:</b> Following several months of debate and negotiations in 2025, EU policymakers <u>agreed</u> in March 2026 to ban the use of the word “meat” and 31 meat-related terms for fermentation-enabled, plant-based, and cultivated options, despite consistent survey results demonstrating that European consumers support the use of these terms for plant-based products.</p>

## Conclusion

The fermentation field is diversifying and expanding, with many industry players now focused on scaling. Public and private investments in R&D and manufacturing are still being made, but not at levels sufficient for continued innovation and commercial scale up. Several companies reached important food biomanufacturing scaling milestones, but IP conflicts around foundational technologies and labeling restrictions risk slowing sector growth. Many governments are prioritizing fermentation-enabled proteins in their national food strategies to achieve a range of goals, from climate mitigation and food security to economic competitiveness and public health.

The underlying case for fermentation-enabled protein is stronger than ever: rising demand for meat, climate and land use pressures, and the need to diversify protein supply chains. To fully realize the planetary and public health benefits that come with mainstream adoption of fermentation-enabled meat and other alternative proteins, governments, industry, and the research community must prioritize support for innovation that can help these new foods reach more plates.