2024 STATE OF THE INDUSTRY:

Fermentation

for meat, seafood, eggs, dairy, and ingredients

Acknowledgments

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About GFI's State of Alternative Proteins series

GFI's State of Alternative Proteins series serves as our annual alternative protein sector deep-dive. The series compiles business developments, key technologies, policy updates, and scientific breakthroughs from around the world that are advancing the entire field. To read other reports, visit the series homepage.

Executive summary

The year 2024 included milestones across science, industry, and policy: the scientific ecosystem grew with new research centers and pilot facilities, mycoprotein continued to receive extensive R&D and commercialization interest, and significant regulatory approval milestones were seen in Canada and New Zealand.

The fermentation sector also faced challenges. Fermentation companies need access to more resources to expand product variety, increase scale, and implement process improvements. Looking ahead, fermentation companies must continue to pursue creative and multipronged funding strategies to access the capital needed for the industry to achieve scale.

This year, 165 companies focused primarily on fermentation. Another at least 210 diversified companies have joined the industry (through investments, partnerships, etc.), working along with a growing number of scientists to innovate and optimize fermentation-enabled foods so consumers can enjoy the foods they love made with a lighter footprint. In a challenging funding environment, the fermentation industry demonstrated resilience and raised $651 million in total private funding in 2024, all of which was raised by privately held companies, and according to GFI's estimates, another $510 million in public investments from governments. This represents an increase in funding totals year-over-year, with investors drawn to the sector often citing product functionality and high consumer favorability.

These are among the notable advancements in 2024:

Commercial landscape

- **New openings:** At least 16 fermentation facilities opened or were announced in 2024. Most of the activity occurred in the biomass and precision fermentation sectors, although at least one traditional fermentation facility opened and one was announced. At least five of those facilities were innovation hubs or research and development centers, which can help companies de-risk processes, demonstrate commercial viability, and reduce scale-up costs.
- **Involvement by diversified companies:** New activity in the fermentation sector from diversified companies accelerated in 2024. Diversified companies established partnerships, invested in companies and facilities, and debuted new fermentation-enabled products.
- **New partnerships**: At least 21 partnerships were formed in the fermentation sector in 2024, with especially robust activity in dairy product development and commercialization, seafood product development, and process optimization. Dairy end-product manufacturers, in particular, are recognizing fermentation's unique ability to efficiently produce functional ingredients, as several large conventional dairy companies partnered with fermentation companies in 2024.

Investments

- **Significant deals:** The four largest fermentation deals in 2024 were **Meati**'s $100 million Series C, **Perfect Day**'s $90 million Series E, **Formo**'s $61 million Series B, and **Infinite Roots**' $58 million Series B.
- **The long-view context:** Of the top four fermentation deals in 2024, only **Meati**'s ranks among the all-time top 10 largest investments in the fermentation sector. The investment environment of the past two years has been fundamentally different from the low-interest-rate period of 2019 to 2022, when the other nine largest fermentation rounds were raised.
- **Total raised**: Since the first disclosed investment in a fermentation company in 2013, privately held companies in the fermentation sector have raised $4.8 billion, while publicly traded companies have secured $39 million.

Science and technology

- **Scientific ecosystem gains healthy momentum**: Three new Centers of Excellence in Alternative Protein, funded by the Bezos Earth Fund, were founded at Imperial College London, the National University of Singapore, and North Carolina State University. Meanwhile, NAPIC and SUSFERM launched fermentation-focused research centers.
- **New pilot capabilities**: From Australia's FaBA to the iFAB in the U.S., new facilities were planned, while **MISTA** commissioned a high- and low-moisture extruder for piloting end products.
- **Precision fermentation advances in titer: EVERY Company** reported ovalbumin titers from 17-30 g/L in *K. phaffii,* and **Onego Bio** reported 120 g/L in *Trichoderma reesei*, representing significant strides over previously published titers in *S. cerevisiae*, *K. phaffii*, and *T. reesei*.

Government and regulation

- **Canada**: Canada approved fermentation-derived animal-free milk for the first time in January 2024, when Health Canada issued a "Letter of No Objection" indicating that it does not have food safety concerns about the use and sale of **Remilk**'s animal-free milk protein.
- **India**: In August 2024, the Indian Union Cabinet approved the BioE3 policy (Biotechnology for Economy, Environment, and Employment Policy for Fostering High-Performance Biomanufacturing) with smart protein (alternative proteins, including fermentation-derived proteins) as one of six key thematic sectors.
- **New Zealand**: In May 2024, New Zealand's **Daisy Lab**, a precision fermentation biotech company, received approval from the New Zealand Environmental Protection Authority (EPA) for their application to expand their dairy protein production platform to 5,000 liters. This regulatory approval will enable the construction of a pilot facility, marking a significant step forward in scaling and marketing this technology in New Zealand, the largest global dairy exporter.
- **United States**: In 2024, the United States government funded nearly 25 research projects or business grants advancing fermentation technology for defense, economic development, agricultural benefits, or nutrition enhancement, including a $51 million investment in precision fermentation capacity in Illinois.

Unless otherwise cited, all of the investment information presented in this "Executive Summary" is from GFI's analysis of data from the Net Zero Insights platform. Please note that aggregated data has not been reviewed by Net Zero analysts.