

# **India Precision Fermentation Ingredients Market Assessment, By Ingredient Type [Proteins, Enzymes, Flavor & Fragrance Compounds], By Microbes [Yeast, Algae, Bacteria, Others], By Application [Meat & Seafood, Dairy Alternatives, Egg Alternatives, Others], By End-user [Food Industry, Healthcare & Pharmaceuticals, Personal Care & Cosmetics Industry], By Size of Business [Small and Medium Enterprises, Large Enterprises], By Distribution Channel [Direct to Manufacturers, Retail and Consumer Channels], By Region, Opportunities and Forecast, FY2017-FY2031F**

<https://marketpublishers.com/r/I3021570D1EFEN.html>

Date: March 2025

Pages: 103

Price: US\$ 3,300.00 (Single User License)

ID: I3021570D1EFEN

## **Abstracts**

India precision fermentation ingredients market size was valued at USD 353.4 million in FY2023, which is expected to reach USD 2273.74 million in FY2031, with a CAGR of 26.2% for the forecast period between FY2024 and FY2031. The market has experienced significant growth in recent years, driven by market drivers and emerging trends. Increasing demand for sustainable and environment-friendly ingredients in various industries, such as food, pharmaceuticals, and cosmetics, is a key driver. Precision fermentation offers a more sustainable and efficient alternative to traditional agriculture, reducing the environmental impact and conserving resources.

Additionally, the rising popularity of plant-based and alternative protein products has fueled the market, with precision fermentation enabling the production of high-quality,

plant-based proteins and flavor compounds. In the pharmaceutical sector, the ability to produce complex molecules through precision fermentation has opened new avenues for drug development. Moreover, the Indian market has witnessed a surge in investments and startups focused on precision fermentation technologies, fostering innovation and competition. Current trends include collaborations between biotechnology firms and established industries, advancements in fermentation techniques, and evolving regulatory frameworks to ensure the safety and quality of precision fermentation ingredients. As consumers become increasingly conscious of sustainability and health, the India precision fermentation ingredients market is poised for continued expansion and innovation in the coming years.

For example, in 2022, Evo Foods, a biotech startup specializing in alternative protein solutions with its headquarters in the United States and India, revealed a collaboration based on cell development kits with Ginkgo Bioworks, a prominent platform for horizontal cell programming. This partnership aims to innovate in producing animal-free egg proteins, potentially paving the way for creating ingredients for highly authentic plant-based eggs.

#### Growing Investment in Research and Development by Major Players

Major players in the India precision fermentation ingredients market have significantly ramped up their investments in research and development (R&D) to harness the full potential of this transformative technology. Recognizing the immense opportunities precision fermentation offers in sustainable and efficient ingredient production, domestic and international companies have allocated substantial resources to innovate and develop new applications. These investments focus on improving fermentation processes, optimizing strains of microorganisms, and expanding the range of ingredients that can be produced. Furthermore, R&D efforts are directed towards addressing scalability challenges and ensuring cost-effectiveness. The commitment to innovation enhances the competitiveness of these companies and drives the evolution of the precision fermentation landscape in India, fostering the creation of novel, eco-friendly, and nutritionally valuable ingredients for various industries.

For example, in 2022, Phyx44, headquartered in Bengaluru, announced its utilization of precision fermentation to produce whey, casein proteins, and fatty acids typically found in dairy products, all while eliminating lactose and significantly reducing the environmental impact compared to traditional dairy production. The funding for this endeavor has been secured from a consortium of investors, including Better Bite Ventures, Ahimsa VC, PeerCapital, Spectrum Impact, Managing Director & Partner at

Boston Consulting Group, Big Idea Ventures, and Humane Society International, among several others.

### Rising Consumer Awareness about the Benefits of Precision Fermentation

The India precision fermentation ingredients market has seen a significant boost from the rising consumer awareness of the benefits of precision fermentation. As consumers increasingly prioritize health, sustainability, and ethical considerations, they become more discerning about their products. Precision fermentation aligns with these values as it offers numerous advantages, including reduced environmental impact, production of bio-based ingredients, and the creation of healthier, plant-based alternatives. The heightened awareness has driven demand for precision-fermented ingredients, particularly in sectors like plant-based foods, nutritional supplements, and sustainable cosmetics. Consumers are now actively seeking products made with precision-fermented ingredients, incentivizing companies to incorporate them into their offerings. As this trend continues to gain momentum, it is expected to play a pivotal role in shaping the market's growth trajectory, driving innovation, and expanding its applications in various industries.

### Increasing Demand for Plant-Based and Sustainable Food Products

The India precision fermentation ingredients market is experiencing a surge in demand, primarily driven by the growing appetite for plant-based and sustainable food products. As consumers become increasingly health-conscious and environmentally aware, they are seeking alternatives to traditional animal-derived ingredients. Precision fermentation offers a sustainable and eco-friendly solution by enabling the production of bio-based ingredients without the need for extensive land and water resources, and with a reduced carbon footprint. It aligns perfectly with the rising trend of plant-based diets and the desire for cruelty-free, ethically sourced ingredients. Additionally, precision fermentation allows for the creation of nutritional and functional ingredients, making it an attractive choice for health-conscious consumers. For example, in 2023, The Live Green Co., an AI startup known for its 'Charaka' platform used to identify plant-based alternatives for animal ingredients, synthetics, and highly processed components, has introduced a precision fermentation branch.

### Impact of COVID-19

The pandemic had a mixed impact on the India precision fermentation ingredients market. Initially, disruptions in supply chains and logistical challenges hindered the

production and distribution of precision-fermented ingredients, causing short-term setbacks. However, as the pandemic highlighted the importance of sustainable and resilient food production systems, there was an increased focus on alternative and eco-friendly sourcing of ingredients, which benefited precision fermentation. Consumer demand for plant-based and health-conscious products grew during the pandemic, driving the adoption of precision-fermented ingredients in areas such as plant-based meat substitutes and nutritional supplements. Despite initial setbacks, the crisis ultimately accelerated the awareness and adoption of precision fermentation in India, positioning it as a promising solution for sustainable ingredient sourcing in a post-pandemic world.

### Key Player Landscape and Outlook

The landscape of key players in the India precision fermentation ingredients market has been evolving rapidly. Domestic companies and startups have been actively entering the market, driven by the growing demand for sustainable and bio-based ingredients. Additionally, international players have shown keen interest in the Indian market through partnerships or direct investments, further intensifying the competition. Notable global companies such as Novozymes have expanded their presence in India, aiming to leverage the country's skilled workforce and emerging biotech ecosystem. The outlook for the market remains optimistic, with continued investments in research and development, production capacity expansion, and innovative applications of precision fermentation. As consumers increasingly seek natural and sustainable products, India's precision fermentation ingredients market is poised for robust growth and innovation in the coming years.

For instance, in 2022, Perfect Day, a precision fermentation expert, successfully concluded its acquisition of Sterling Biotech Limited (SBL), an Indian company. The strategic move is expected to significantly increase Perfect Day's production capacity in the forecast years. Furthermore, Perfect Day has obtained approval from the Food Safety and Standards Authority of India to introduce animal-free dairy proteins into the Indian market.

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\*Companies mentioned above DO NOT hold any order as per market share and can be changed as per information available during research work

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