

Smart Protein Economic Analysis



India's smart protein sector has truly taken off over the last two years - with new products going to market every few months, more than **50 startups** now active in the space, and an ecosystem of **80+ companies** supporting the growth of these startups. But there's a lot that remains to be seen and the market size of the smart protein sector in India hasn't been comprehensively mapped before. Investors and other stakeholders that GFI India engages with frequently ask us what the true potential of the sector is.

To answer questions like these, over the last several months, **GFI India has been working with Deloitte India on a Smart Protein Economic Analysis, to gauge what smart protein could mean for India's economic future in terms of market size, export potential, job creation, and more.**

METHODOLOGY

Our domestic market size models for plant-based meat, eggs, and dairy and meat from fermentation across scenarios were built after considering various factors such as penetration of the various products/categories across different Socio-Economic Classifications (SECs), adoption rates, replacement potential, and prices of both conventional and plant-based products by 2030. Other key assumptions which underpin the path to taste and price parity for various categories across the three scenarios are different levels of supply chain localization and investments in R&D and local talent development. Projections have been calculated across 3 scenarios - low-growth, medium-growth, and high-growth.*

For export potential, we considered various factors such as penetration and variety of existing categories in overseas markets, unique propositions offered by Indian smart protein products in overseas markets, and export volume and growth trends of similar or adjacent food products and categories from India such as conventional meat, dairy, and ready-to-eat/ready-to-cook foods.

For employment, keeping in mind India's world-class, affordable talent pool across food processing, agriculture, biopharma, and other related industries, employment generation was calculated at each stage of the value chain at two levels - direct and indirect employment. We calculate the number of jobs based on total wages, and average salaries, and consequently apply a validated multiplier of 9.6 to calculate indirect employment.

For economic impact, Gross Value Added (GVA) was calculated at each stage of the value chain. Smart protein-specific activities such as isolate manufacturing, end product manufacturing, growth factor, and recombinant protein manufacturing, and so on were factored into direct economic impact calculations, and activities such as crop production, retail, distribution, logistics, and so on were factored into indirect economic impact calculations. The direct economic impact was calculated using Deloitte's proprietary input-output modeling. Key data points were sourced from publicly available financial data from companies in the smart protein value chain (where this data was unavailable, financials from companies in adjacent industries were used). The indirect economic impact was calculated using Supply Use Tables (SUT) for India and using a validated multiplier of 2.35. All findings have been further vetted and validated via external expert stakeholder consultations.

KEY FINDINGS

Here are our top line ranges (both low growth and high growth scenarios) for the domestic market size and export potential of plant-based meat, eggs, dairy, and fermentation-derived meat, along with the export potential of cultivated meat:

The total economic opportunity (domestic market size + exports) for smart protein in 2030 ranges from **INR 12,075 crore (USD 1.5 billion) to INR 33,194 crore (USD 4.2 billion)**

**Scenarios explained: The penetration, adoption, and replacement potential calculations were arrived at using a combination of GFI India's primary research on the target market and Deloitte's proprietary market sizing modeling. To understand the path to taste and price parity for various alternative protein categories, we conducted a series of interviews with experts across the industry.*

PLANT-BASED MEAT

- The domestic market size for plant-based meat in 2030 ranges from **INR 1,803 crore (USD 228 million) to INR 5,884 crore (USD 745 million)**
- The export potential for plant-based meat in 2030 ranges from **INR 2,194 crore (USD 278 million) to INR 6,824 crore (USD 864 million)**
- The total economic impact of plant-based meat in 2030 ranges from **INR 2,708 crore (USD 329 million) to INR 8,799 crore (USD 1 billion)**
- The total number of jobs created by plant-based meat in 2030 ranges from **63,168 jobs to 149,395 jobs.**

PLANT-BASED EGGS

- The domestic market size for plant-based eggs in 2030 ranges from **INR 527 crore (USD 67 million) to INR 1,416 crore (USD 179 million)**
- The export potential for plant-based eggs in 2030 ranges from **INR 266 crore (USD 34 million) to INR 631 crore (USD 80 million)**
- The total economic impact of plant-based eggs in 2030 ranges from **INR 287 crore (USD 35 million) to INR 815 crore (USD 99 million)**
- The total number of jobs created by plant-based eggs in 2030 ranges from **8,621 jobs to 24,422 jobs.**

PLANT-BASED DAIRY

- The domestic market size for plant-based dairy in 2030 ranges from **INR 4,827 crore (USD 611 million) to INR 10,625 crore (USD 1.3 billion)**
- The export potential for plant-based dairy in 2030 ranges from **INR 459 crore (USD 58 million) to INR 1,889 crore (USD 239 million)**
- The total economic impact of plant-based dairy in 2030 ranges from **INR 1,798 crore (USD 218 million) to INR 4,252 crore (USD 516 million)**
- The total number of jobs created by plant-based dairy in 2030 ranges from **58,854 jobs to 180,355 jobs**

FERMENTATION DERIVED MEAT

- The domestic market size for meat produced via biomass/precision fermentation in 2030 ranges from **INR 318 crore (USD 40 million) to INR 1,038 crore (USD 131 million)**
- The export potential for meat produced via biomass/precision fermentation in 2030 ranges from **INR 351 crore (USD 44 million) to INR 819 crore (USD 103 million)**
- The total economic impact of meat produced via biomass/precision fermentation in 2030 ranges from **INR 409 crore (USD 50 million) to INR 1,135 crore (USD 137 million)**
- The total number of jobs created by meat produced via biomass/precision fermentation in 2030 ranges from **8,788 jobs to 24,391 jobs**

CULTIVATED MEAT

- The export potential for cultivated meat in 2030 ranges from **INR 1,312 crore (USD 164 million) to INR 4,152 crore (USD 520 million)**
- The total economic impact of the cultivated meat industry in 2030 ranges from **INR 1,233 crore (USD 150 million) to INR 3,909 crore (USD 475 million)**
- The total number of jobs created by the cultivated meat industry in 2030 ranges from **15,594 jobs to 49,421 jobs**

CUMULATIVE MARKET OPPORTUNITY

- The consolidated domestic market size for smart protein in 2030 ranges from **INR 7,475 crore (USD 946 million) to INR 18,963 crore (USD 2.4 billion)**
- The consolidated export potential for smart protein in 2030 ranges from **INR 4,582 crore (USD 480 million) to INR 14,321 crore (USD 1.4 billion)**
- The total economic impact of all smart protein categories in 2030 ranges from **INR 6,435 crore (USD 781 million) to INR 18,909 crore (USD 2.3 billion)**
- The total number of jobs created by smart protein industry in 2030 ranges from **151,025 jobs to 427,985 jobs**

DOMESTIC MARKET SIZE BY 2030 (IN INR CR)

SCENARIO	PLANT-BASED MEAT	PLANT-BASED DAIRY	PLANT-BASED EGGS	FERMENTATION DERIVED MEAT	OVERALL
CURRENT MARKET SIZE (2022)	100	250	1	-	351
LOW GROWTH	1,803	4,827	527	318	7,475
MEDIUM GROWTH	3,525	7,643	989	622	12,779
HIGH GROWTH	5,884	10,625	1,416	1,038	18,963

EXPORT POTENTIAL BY 2030 (IN INR CR)

SCENARIO	PLANT-BASED MEAT	PLANT-BASED DAIRY	PLANT-BASED EGGS	FERMENTATION DERIVED MEAT	CULTIVATED MEAT*	OVERALL
LOW GROWTH	2,194	459	266	351	1,312	4,582
MEDIUM GROWTH	4,722	1,208	432	604	2,415	9,381
HIGH GROWTH	6,824	1,889	631	819	4,158	14,321

ECONOMIC IMPACT BY 2030 (IN INR CR)

SCENARIO	PLANT-BASED MEAT	PLANT-BASED DAIRY	PLANT-BASED EGGS	FERMENTATION DERIVED MEAT	CULTIVATED MEAT*	OVERALL
LOW GROWTH	2,708	1,798	287	409	1,233	6,435
MEDIUM GROWTH	5,636	3,010	546	749	2,270	12,211
HIGH GROWTH	8,799	4,252	815	1,135	3,909	18,909

EMPLOYMENT BY 2030

SCENARIO	PLANT-BASED MEAT	PLANT-BASED DAIRY	PLANT-BASED EGGS	FERMENTATION DERIVED MEAT	CULTIVATED MEAT*	OVERALL
LOW GROWTH	63,168	54,854	8,621	8,788	15,594	151,025
MEDIUM GROWTH	105,725	115,526	16,387	16,101	28,704	282,444
HIGH GROWTH	149,395	180,355	24,422	24,391	49,421	427,985

*Includes exports, economic impact, and jobs created by the production of growth factors and recombinant protein