

Food tomorrow

Elevating India's role in the
plant-based revolution

March 2024



Fore

In a world grappling with unprecedented challenges, from climate change to growing health concerns, the spotlight is increasingly shifting towards healthy and sustainable food systems. Plant-based foods have emerged as a beacon of hope, not only addressing these pressing issues but also unlocking a myriad of business opportunities.

Traditionally, the food industry has relied heavily on animal-based products. However, a paradigm shift is underway, with plant-based foods gaining momentum fueled by an informed consumer base increasingly aware of the environmental and health impacts of their dietary choices. This transformative trend is reshaping the industry landscape, presenting both challenges and opportunities that demand collaboration and innovation from all stakeholders.

Food tomorrow: elevating India's role in the plant-based revolution offers an analysis of the plant-based food sector, delving into global and Indian trends, challenges, and opportunities. From analyzing market trends and consumer preferences to outlining strategies for emerging enterprises and advocating for policy recommendations, our knowledge paper aims to serve as a guiding light in navigating the complex terrain of the plant-based food industry.

Collaborative efforts and informed decision-making can pave the way towards building a sustainable and healthy food system for all. I trust that this knowledge paper will contribute to ongoing dialogue and thereby contribute towards elevating India's role in the global plant-based revolution.



Satyam Shivam Sundaram

Partner Strategy and Transaction,
EY LLP



word



The Plant Based Food Industry Association (PBFIA) is committed to transforming the entire food system in India through collaboration, networking, market research, and assisting food enterprises to flourish in the plant-based foods industry. We are delighted to partner with EY for this knowledge paper, illuminating the dynamic landscape of plant-based foods and unveiling strategies crucial for sustainable growth and nourishment.

As global markets witness a remarkable surge in the consumption of plant-based products, it becomes increasingly imperative to understand the driving forces behind this paradigm shift and to strategize effectively for sustainable growth and nourishment. The journey towards a plant-based diet is not merely about substitution; it necessitates a comprehensive consideration of nutritional profiles, sustainability, and ecological impacts.

In this pursuit, India emerges as a beacon of potential. While the plant-based food industry in India is currently in its nascent stages, it holds immense promise for exponential growth. With appropriate interventions and strategic implementations, India's plant-based food market is poised to surpass the US\$5 billion milestone by 2032. To achieve this ambitious target, the industry must invest in innovation and reinvent itself to offer products with minimal ingredients and superior taste, aligning with consumers' evolving preferences.

Indian consumers have a rich history of incorporating protein-rich foods such as soybeans, jackfruit, dairy, and pulses into their diets. Moreover, they perceive plant-based meat substitutes as highly innovative, trendy, healthy, and environmentally friendly options. Given these encouraging trends, it comes as no surprise that the Indian market presents abundant opportunities for growth in the realm of plant-based and vegan food offerings. It also stands strongly supported by the large and growing base of consumers born as and raised as vegetarians.

At the Plant Based Foods Industry Association, we are deeply committed to driving positive change within the industry and advocating for solutions that promote health and sustainability. Our initiatives, which include the establishment of the "Plant Protein Cluster," aim to bridge the demand-supply gap and position India as a global leader in the production of plant-based food. As governments play a pivotal role in shaping policies and regulations, we continue to engage with them to garner support for our initiatives and promote sustainable practices across the food supply chain.

I extend my gratitude to EY for their collaboration on this insightful knowledge paper and to all stakeholders involved in advancing the plant-based foods industry. Together, we can create a healthier and more sustainable future for generations to come.



Sanjay Sethi

Executive Director,
Plant Based Foods Industry Association



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Introduction

The world is witnessing a paradigm shift towards plant-based foods, especially due to the increasing consciousness towards environmental impact and personal well-being. A recent study by Oxford Martin School researchers estimates the high potential of a worldwide shift towards plant-based foods, projecting to save 8 million lives by 2050, as well as mitigating climate damages of around US\$1.5 trillion.¹

As the world braces for this transformative transition, India stands at the forefront of this epochal change, poised to elevate its role in the burgeoning plant-based revolution.

In a landscape where wellness and environmental stewardship intertwine, the emergence of plant-based nutrition represents far more than a mere dietary preference. It signals a seismic shift towards conscious consumption—a paradigm where fruits, vegetables, legumes, and grains emerge not as mere substitutes, but as dynamic sources of sustenance, flavor, and vitality. This profound reorientation of protein supplementation, once monopolized by animal products, heralds a new era where ethical considerations and planetary health take center stage.

Enter "Food tomorrow: elevating India's role in the plant-based revolution." This knowledge paper serves as a beacon of enlightenment, delving into the global and Indian trends shaping the plant-based food sector, while unraveling the challenges and opportunities that await emerging enterprises. The paper is a comprehensive guide, offering strategic recommendations to the government for ecosystem facilitation. It also delves into the exploration of environmental sustainability and ethical imperatives, presenting readers with a roadmap to navigate the myriad of possibilities. Its ultimate goal is to steer India towards a brighter, greener future.

¹ Plant-Based Food Market - Size, Growth, Trends, Share | 2033 (futuremarketinsights.com)

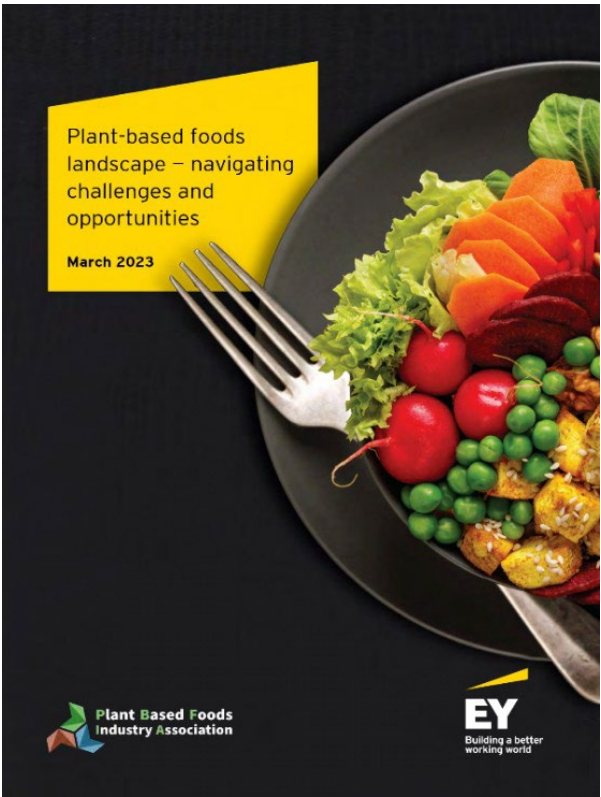
Recap of the Previous edition of the knowledge paper

PBFIA 2023

Plant based food landscape - navigating challenges and opportunities

Key areas of analysis:

- ▶ Plant-based foods and global trend of plant-based diets
- ▶ Overview of plant-based food in India
- ▶ Challenges and opportunities
- ▶ Strategies for implementing plant-based food in business.
- ▶ Government initiatives



[Plant-Based Foods Landscape - Navigating Challenges and Opportunities - PBFIA](#)



01

The global plant-based industry

Overview of global plant-based industry

The plant-based food industry is experiencing substantial growth, driven by a robust CAGR of ~12%. This expansion is not solely centered on personal health benefits, although studies link plant-based diets to reduced disease risks. Increasingly, ethical considerations regarding animal welfare and environmental impact are propelling the demand for plant-based options.

The dietary change is being embraced by nearly all segments of consumers, resulting in the emergence of a new segment, “**flexitarians**”. Flexitarians are incorporating meatless (animal/fish origin) alternatives into their diets and are leading the mainstream adoption of plant-based choices. The global impact is evident across regions. Europe stands out for its high demand and advanced technology, while North America encounters the challenge of maintaining freshness and novelty. The Asia-Pacific region, known for its affinity for seafood, is witnessing innovation in plant-based seafood alternatives.

The diversity of plant-based offerings encompasses all food segments, including milk alternatives. Plant-based meats, including burgers and nuggets, are gaining popularity for their impressive taste and texture. Plant-based indulgences, such as bakery treats and desserts, are reshaping the concept of indulgence, while on-the-go options like plant-based juices, teas, and coffees cater to health-conscious consumers.

The landscape is gradually turning competitive, wherein established companies like Beyond Meat and Impossible Foods face challenges from innovative disruptors. Success in this industry hinges not only on brand recognition but also on the critical factors of availability, taste, price competitiveness, and accessibility. Plant-based alternatives have to match or surpass the taste of animal products while remaining affordable and readily available to capture the palate and purse of consumers.

Growth factors and market trends

The plant-based food industry is experiencing significant growth driven by factors such as consumer interest, product innovation, and increased investment. Evolving from a niche concept, this dietary revolution has permeated supermarket shelves and restaurant menus, capturing a diverse and expanding audience.

Several intertwined factors contribute to this growth. Health-conscious consumers, informed by evidence linking animal protein to chronic diseases, are opting for plant-based alternatives as a means of promoting well-being. Concerns about animal welfare and the environmental impact of animal/poultry farming and aquaculture are leading to a compassionate shift towards cruelty-free alternatives. Additionally, the surge in culinary creativity has challenged stereotypes of bland tofu and limp lettuce, offering plant-based choices with exotic flavors and textures.

This heightened consumer awareness has attracted significant investor interest, resulting in substantial funding for the plant-based sector. Venture capitalists, recognizing the market's growth potential, are actively seeking opportunities, contributing to increased research and development. This financial support leads

to the creation of new products that closely mimic animal counterparts, broadening the appeal to various consumer preferences.

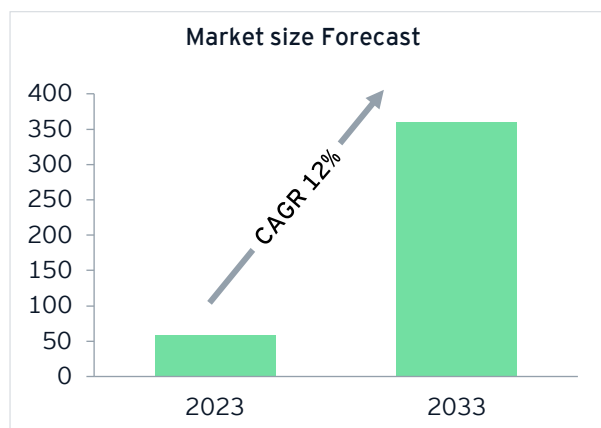
The plant-based market is not a uniform entity but a diverse ecosystem with distinct channels. Supermarkets, responding to rising demand, are dedicating entire aisles to plant-based offerings. Foodservice chains, spanning from fast-food establishments to Michelin-starred restaurants, are incorporating plant-based options to cater to a growing segment of their clientele. The growth of e-commerce provides fertile ground for niche brands and innovative products to thrive.

The dynamism of this market is evident in its continuous evolution. Ongoing innovations introduce a variety of new products that cater to diverse tastes and dietary preferences. From plant-based burgers with realistic textures and flavors to dairy-free cheeses offering creamy bliss, culinary imagination is expanding. Innovation extends beyond taste and texture, encompassing sustainability and health, with companies exploring alternative protein sources to minimize environmental impact while maximizing nutritional value.²

Plant-based food market analysis

Market size and forecast:

The global plant-based food and beverage market is anticipated to grow significantly, increasing from ~US\$60 billion in 2023 to an estimated ~US\$360 billion by 2030. This indicates substantial exponential growth, with a notable compounded year-over-year growth rate of 12%, showcasing a robust demand for plant-based options.



²Exploring the Growth and Future of the Plant-Based Food Market (futuremarketinsights.com)

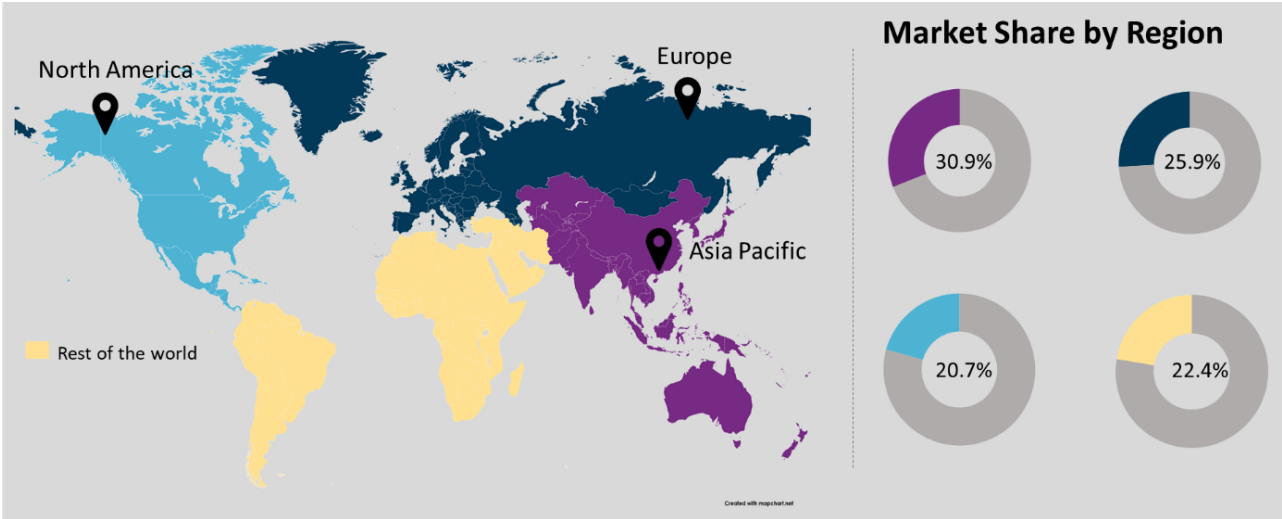


Regional analysis: divergent shores, converging trends

As the plant-based revolution expands globally, certain regions emerge as key players. In the Asia-Pacific region, known for its high seafood consumption, innovative alternative seafood options have

contributed to capturing nearly 30% of total investment volumes in 2021. Europe, with a growing demand for healthy alternatives, stands as another lucrative market. North America, being the birthplace of prominent plant-based brands, remains a significant player.³

Regional analysis⁴



India: A Rising Star on the Horizon
This region, accounting for ~16% of global sales, is a major growth hotspot. Imagine bustling markets filled with vibrant mango lassi, creamy coconut curries, and sweet almond desserts, all fuelling the plant-based revolution.

Investments sprouting across borders

The growth in the plant-based landscape is driven not only by consumer demand but also by substantial investments. Governments worldwide, including Canada and Denmark, are providing grants and forming public-private partnerships to support the sector. Additionally, venture capitalists, previously cautious, are now actively investing in plant-based companies. For instance, Blue Horizon in Switzerland

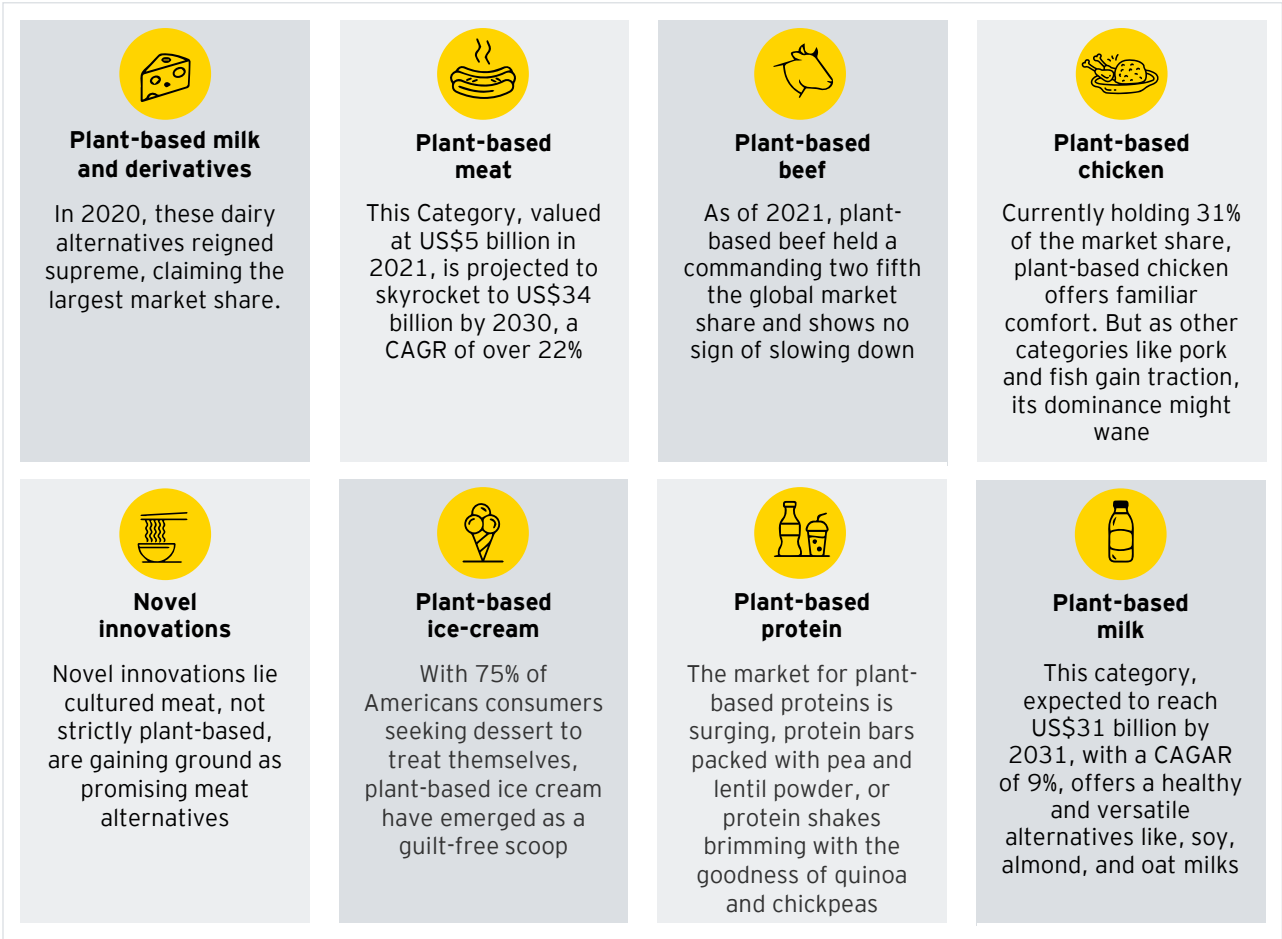
has allocated US\$850 million to invest in over 50 alternative protein companies, and Veg Capital in the UK supports early-stage plant-based ventures. Both government support and private investments help sustain this thriving market and ensure continued growth and innovation within the plant-based food and beverage industry.

³ Plant-based Food Market Size, Share, Growth Analysis - Industry Forecast 2023-2030 (skyquestt.com)
⁴ EY India analysis and industry knowledge paper by marketresearchfuture.com

A tapestry of tastes: unveiling the plant-based food landscape

The plant-based food market comprises various categories, catering to different consumer preferences, forming a detailed landscape of the market.

Product segments of Plant-based food⁵



This overview provides a glimpse into the diverse choices available in the plant-based food market. As consumers prioritize health, environmental considerations, and culinary exploration, the market is expected to expand further, offering a range of delicious and sustainable options.

⁵ [The Rising Plant Based knowledge paper final for approval.pdf \(assochem.org\)](#)

Key players in the global plant-based industry

In the ever-evolving landscape of plant-based foods, key players shape the industry's future. Beyond Meat and Impossible Foods lead the charge, challenging culinary norms. Emerging contenders like Planters Foods, Kerry Group, and Amys Kitchen are making strides, showcasing the diverse possibilities within plant-based cuisine.

These industry leaders are not only expanding their product reach, but also focusing on strategic collaborations. The Beyond Meat and PepsiCo. partnership, initiated in January 2022, exemplifies this trend. This joint venture aims to introduce innovative plant-based products, leveraging Pepsi's production and marketing prowess. Such collaborations underline the industry's dynamic growth and the merging of expertise for mutual benefit.

As the plant-based market intensifies, taste, texture, price parity, and availability will become the defining factors. The most successful brands are those that excel in these competitive aspects. Companies like

V2food, Aspire Food Group, and Aleph Farms are striving to achieve this delicate balance, introducing new product lines and fortifying their supply chains.

In the realm of plant-based food and beverages, the competition extends beyond startups. Industry giants like Tyson Foods Inc., Danone SA, and Nestlé S.A. have invested significantly in research and development. Localized manufacturing to reduce operating costs has become a strategic imperative for these players. Their commitment to innovation is evident in products like Conagra Brands' Supreme Plant-Based Burger and Starbucks Canada's introduction of oat beverages.

The plant-based revolution extends beyond the culinary space, infiltrating coffee culture. Starbucks, a global coffee giant, adapted to changing consumer preferences by expanding its non-dairy offerings. The introduction of oat, soya and almond beverages reflects this shift, aligning with the growing demand for plant-based alternatives.⁶

Key players⁷

Beyond Meat	Impossible Foods	Daiya foods Inc
Marlow Foods Ltd (U.K.)	Danone SA (France)	Garden Protein International Inc. (Canada)
The Hain Celestial Group, Inc (U.S.)	Nestlé S.A. (Switzerland)	Unilever PLC (U.K.)

⁶Plant-based Food Market Size, Share, Growth Analysis - Industry Forecast 2023-2030 (skyquestt.com)

⁷TOP 10 COMPANIES IN PLANT BASED FOOD MARKET | Meticulous Blog



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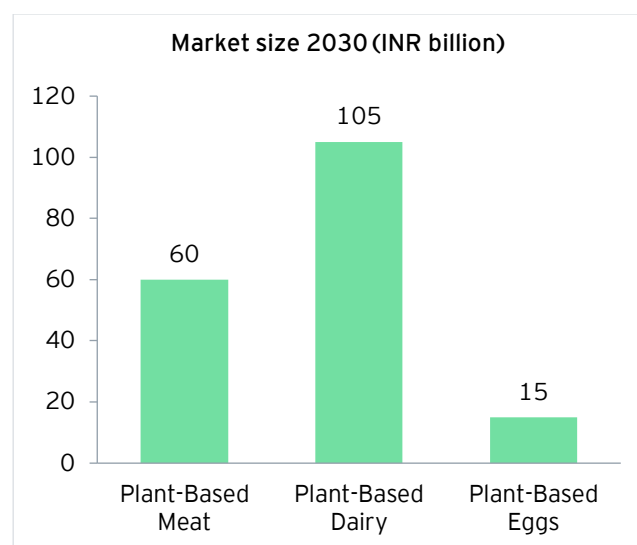
Plant-based foods industry and market trends in India

Overview of the plant-based foods industry in India.

Dietary choices in India are undergoing a notable transformation, with the plant-based foods industry taking center stage. Rooted in the nation's historical connection to vegetarianism and flexitarianism, this culinary shift represents more than a trend—it marks a significant stride towards new opportunities and growth.

India's cultural inclination towards plant-based eating has a longstanding history, making the recent surge in popularity a natural progression. While the term "plant-based" has gained traction in recent times, its essence has been deeply embedded in the country's culinary heritage. The increasing demand for vegan snacks and confectionery further charges the overall expansion of India's plant-based foods market.

Projections for the plant-based food industry in India paint an interesting picture. By 2030, the domestic market for plant-based meat is expected to catapult from US\$30 to 40 million to an impressive US\$500 million. Simultaneously, the plant-based dairy market anticipates robust growth from US\$21 million to US\$64 million, showcasing a noteworthy Compound Annual Growth Rate (CAGR) of 21%.⁸



Source: [India: plant-based food market size by segment 2030 | Statista](#)

⁸ The Rising Plant Based knowledge paper final for approval.pdf (assochem.org)

Consumer preferences are evolving, with the plant-based industry gaining acceptance even among non-vegetarians, flexitarians, and those in transition. This broadening consumer base is pivotal for the sustained growth of the sector.

Despite challenges related to food insecurity and environmental impact, the plant-based sector in India is responding to innovative approaches. Sustainable and ethical production methods are gaining traction, offering a potential solution to mitigate environmental consequences.

As SMEs and FMCGs actively participate in India's plant-based food sector, over 50 start-ups have

already entered the space, providing alternatives across various segments. This sector's expansion not only creates economic opportunities but also addresses challenges related to food poverty, climate change, and public health.

The future appears promising for the plant-based foods industry in India. Driven by a growing consumer base inclined towards healthier and planet-friendly choices, coupled with the country's diverse crop yield, advanced food and beverage industry, research institutes, and a flourishing private equity sector, the sector is poised for continued expansion and innovation.^{9,10}

Consumer preferences in India

Consumer preferences for plant-based food in India are experiencing a significant shift, reflecting a global trend toward embracing plant-centric diets. The rapid growth of the plant-based food category in grocery stores is setting new records, with Google Trends indicating an unprecedented surge in searches related to vegan topics worldwide. This heightened interest is attributed to a growing awareness of the health benefits associated with plant-based diets, a trend that has intensified in the wake of the pandemic.

Indian consumers, influenced by both Western and indigenous culinary concepts, are diversifying their plant-based choices. Traditional options like jackfruit, Kebabs, soya-based meat; coconut, soya, oats, almond milk are gaining popularity alongside Western offerings such as salami and cold cuts. A recent survey by Renub research revealed that a substantial ~80% of Indian consumers are open to trying plant-based meat products, reflecting a positive attitude, especially among early adopters.

The plant-based industry in India is still in its early stages, presenting ample opportunities to optimize the manufacturing chain. As consumer preferences continue to evolve, catalyzed by experiences that raise awareness about cruelty to animals, there is a notable shift in social networks reconsidering meat consumption. This indicates a positive trajectory for

the plant-based industry, with the anticipation of emerging substitutes across various food categories.

The knowledge paper references a survey conducted by Renub Research in collaboration with PBFIA. According to the survey findings, over 67% of the respondents stated that their consumption of plant-based food products was motivated by concerns regarding animal welfare in food production. Additionally, 54% cited reasons such as the positive environmental impact of plant-based foods and their ability to replicate the taste of animal-based foods. Furthermore, a notable proportion of respondents 48% reported selecting plant-based food products due to their perceived potential in reducing the risk of chronic diseases and food allergies. A smaller percentage of respondents 8%¹¹ indicated that they chose plant-based food products because they considered it to be a trend. This data underscores the diverse motivations behind embracing plant-based choices in India, emphasizing a growing demand that is poised to shape the future of the plant-based food landscape.

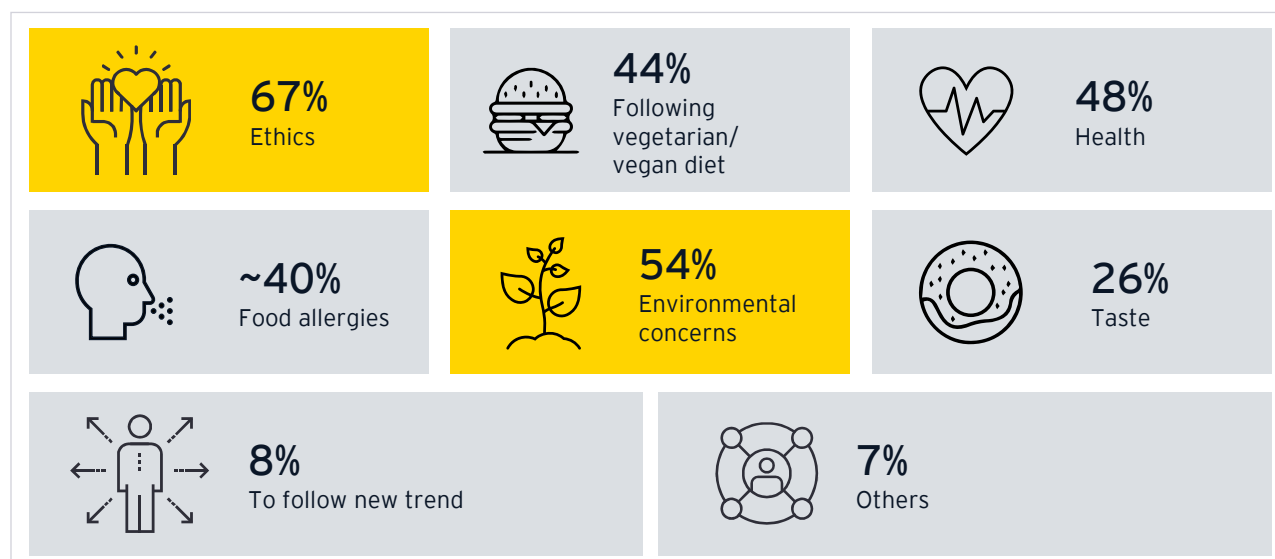
The plant-based movement is gaining momentum in India, reflecting a global transition toward more sustainable and ethical dietary choices. As the industry continues to grow, it holds promise for meeting the evolving preferences and conscientious decisions of Indian consumers on their journey towards embracing plant-based foods.

⁹ [Insights and Opportunities in India's Thriving Plant-Based Sector | IBEF](#)

¹⁰ [India: plant-based food market size by segment 2030 | Statista](#)

¹¹ Survey report by Renub research in collaboration with PBFIA

Top reasons for choosing plant-based food¹²



Market landscape

The Indian market for plant-based foods has witnessed a transformative surge in the last couple of years, offering consumers a diverse array of alternatives ranging from nuts milk to coconut cheese and vegan chicken patties to plant-based eggs. This burgeoning sector has not only captured the attention of vegans and vegetarians, but has also piqued the interest of non-vegetarian consumers seeking sustainable and delectable protein options.

Bio-based revolutionary foods, such as cultivated beef and proteins derived from fermentation methods like tempeh, have played a pivotal role in expanding the horizon of plant-based protein products. The emergence of notable brands, including those supported by influential figures like cricketer Virat Kohli and actor Anushka Sharma, underscores the market's growth potential. Predictions suggest that this relatively nascent segment is poised to reach about US\$1 billion by 2030.

Major players like Tata Consumer Product Ltd (TCPL) have ventured into the plant-based meat products industry, introducing a range of offerings under the brand 'Tata Simply Better,' including **nuggets, burger patties, Awadhi seekh kebabs, and spicy fingers**. This move reflects the increasing accessibility of plant-based meat products through e-commerce platforms and major chains in metropolitan areas.

The HoReCa (hotel, restaurant, and catering) sector is strategically targeting institutional clients, with Quick

Service Restaurant (QSR) chains like **Domino's and Starbucks in India incorporating plant-based meat options into their menus**. The Tata Group's FMCG arm emphasizes that plant-based meats are at the forefront of the larger plant protein landscape, aiming to replicate the sensory and cultural resonance of conventional animal-derived meat without the associated negative impacts.

In this dynamic market landscape, **ITC has introduced ecological plant-based protein** products under its ITC Master Chef IncrEdible brand, featuring Incredible Burger Patties and Incredible Nuggets. The availability of these products through significant retail chains and e-commerce platforms in eight cities highlights the expanding reach of plant-based alternatives in India.

Internationally, **Nestlé plans to launch a plant-based burger in the US** market under the name 'Awesome Burger' in the fall. This burger will be made of **pea protein**, according to the company. Additionally, Nestlé is releasing other plant-based products such as a **ground beef alternative called Garden Gourmet Incredible Mince**, set to be released in Europe next month.

The market for plant-based foods in India is not only witnessing an influx of innovative products but is also gaining acceptance across diverse consumer segments, setting the stage for a sustainable and vibrant future in the realm of plant-based nutrition.¹³

¹² Survey report by Renub research in collaboration with PBFIA

¹³ [The Rising Plant Based knowledge paper final for approval.pdf \(assochem.org\)](#)

Culinary integration: plant-based fusion

In the vibrant realm of Indian cuisine, a captivating transformation is unfolding as plant-based ingredients seamlessly weave into the tapestry of traditional dishes, ushering in a new era in culinary history. This exploration delves into the profound impact of incorporating plant-based alternatives into classic Indian fare, illuminating the evolving practices and cultural shifts within the food landscape.

Tradition with a contemporary twist: Indian vegetarian dishes, deeply rooted in the culinary heritage, serve as a natural canvas for the plant-based revolution. Time-honoured ingredients like lentils, beans, and soy have taken center stage while redefining dals, curries, and biryanis. Innovations abound as tofu replacing paneer tikka in tikka masala, and jackfruit transforms into a delicious pulled pork for vindaloo. Even animal meat-centric favorites like kebabs and kofta find plant-based renditions, incorporating mushrooms, chickpeas, and cauliflower to deliver familiar textures and bold flavors sans the animal meat.

Do not imitate but innovate: The evolution extends beyond replicating traditional dishes, as Indian chefs embark on crafting new culinary narratives inspired by regional flavors and indigenous ingredients. Coconut milk replaces dairy in kormas, while millets and amaranths make their way into *dosas* and *chapatis*, introducing novel textures and heightened nutrition. Experimentation with plant-based milks gives rise to lighter curries and desserts, challenging preconceptions about the boundaries of Indian cuisine.

Shifting practices, elevated presentations: The plant-based movement is not only transforming ingredients but is also influencing cooking techniques and presentation styles. Traditional fermentation methods, harnessed for centuries to enhance flavor and digestibility, find new applications in crafting plant-based yogurt and cheese with distinctive textures and tangs. Street vendors are embracing quick-cooking jackfruit and seitan to offer affordable and flavorful plant-based alternatives. Fine-dining establishments have elevated the elegance of plant-based Indian cuisine, presenting tasty menus that redefine notions of luxury.

Inclusivity, sustainability, and culinary culture redefined: The ascent of plant-based food in India transcends palates - it is a cultural metamorphosis. It fosters inclusivity and caters to vegetarians, vegans, and those with dietary restrictions, creating a more diverse and accommodating culinary landscape. It reinforces a connection to the land and encourages mindful consumption of resources, challenging conventional beliefs about protein sources and promoting healthier lifestyles.

Plant based culinary evolution is enriching rather than replacing India's culinary heritage. Plant-based ingredients, while becoming testament to the ingenuity and adaptability of Indian cuisine, are also proving that culinary creativity knows no bounds and offers endless possibilities where taste and sustainability harmoniously coexist.



03

Plant-based food - challenges and opportunities

The demand for plant-based foods is on the rise, driven by a growing interest in sustainable and healthier dietary choices. However, despite the substantial growth in this market, several key challenges are impeding further advancement. Overcoming barriers such as product formulations, sourcing raw materials, rising operational and production costs, and insufficient funding are crucial for sustained progress.

Challenges

In the dynamic landscape of the plant-based food industry in India, several challenges pose hurdles to its seamless growth. One of the critical challenges is centered around product formulations, as flexitarians, who evaluate plant-based products based on appearance, taste, and texture, set high expectations.

Raw material sourcing emerges as another obstacle for plant-based companies, grappling with issues such as farm production delays, labor shortages, demand fluctuations, and logistical problems. These challenges make ingredient acquisition a crucial aspect for plant-based brands and a highly customized and inherently complex process.

Being price competitive is a substantial concern, with the perception that plant-based food is more expensive due to research and development costs and ingredient procurement expenses. Companies often rely on venture capital, further increasing costs and impacting the final product's price. Additionally, the lack of infrastructure, facility design, manufacturing capability, and advanced technology in the plant-based meat sector hinders cost reduction, maintaining it as a relatively high-priced luxury product.

Lack of sufficient capital looms as a significant barrier, particularly for startups in the plant-based food market. The uniqueness of this market demands substantial investments in product development, research and development, and sourcing, making it challenging for businesses to compete with traditional animal-based products without adequate funding. Addressing these challenges requires a comprehensive understanding of their core, enabling key players to strategize effectively for the future.

Opportunities

The plant-based food market is thriving, driven by a growing focus on health-conscious living and the appeal of nutritious options for the lactose-intolerant population. As the market expands, there are opportunities for growth through increased awareness, effective marketing, expanded distribution, and product innovation. Factors such as urbanization, with an expected urban population of 600 million in India by 2030, contribute to the rise of plant-based preferences, especially among health-conscious urban consumers. Abundant raw materials in India lower production costs, making plant-based foods more affordable. Additionally, the export potential is significant, with the government's supportive measures positioning India as an attractive destination for investment in the plant-based food sector, utilizing its rich culinary heritage for global export. This dynamic landscape not only meets current consumer demands but also presents emerging opportunities for sustainable growth and international market engagement.



Case study: GoodDo - a compassionate plant-based revolution in India¹⁴

GoodDo, an innovative plant-based food company in India, is rewriting the narrative on ethical and delicious alternatives to animal-based products. Driven by a mission to create a compassionate and sustainable food system, GoodDo offers a unique blend of delicious plant-based meat, impactful storytelling, and a focus on affordability and accessibility. This case study delves into their journey, analyzing their products, marketing strategies, target audience, distribution channels, and key factors contributing to their success.

Products and Innovation: GoodDo's core offerings are plant-based meat alternatives that mimic the taste and texture of popular dishes like curries, stir-fries, and wraps. They utilize innovative technologies and ingredients like soy protein, wheat gluten, and spices to create products that are not only delicious but also offer a complete protein profile. Additionally, they promote their goat mascot "GoodDo" to connect with consumers on an emotional level, highlighting the ethical aspect of their products.

Marketing Strategy: GoodDo employs a multi-pronged marketing approach:

- ▶ **Digital Presence:** They leverage social media platforms like Instagram and Facebook to engage with consumers, share recipes, and showcase their brand personality.
- ▶ **Collaborations:** They partner with restaurants and food bloggers to promote their products and reach a wider audience.
- ▶ **Impactful Storytelling:** Their website and marketing materials emphasize the animal welfare and environmental benefits of choosing plant-based alternatives.

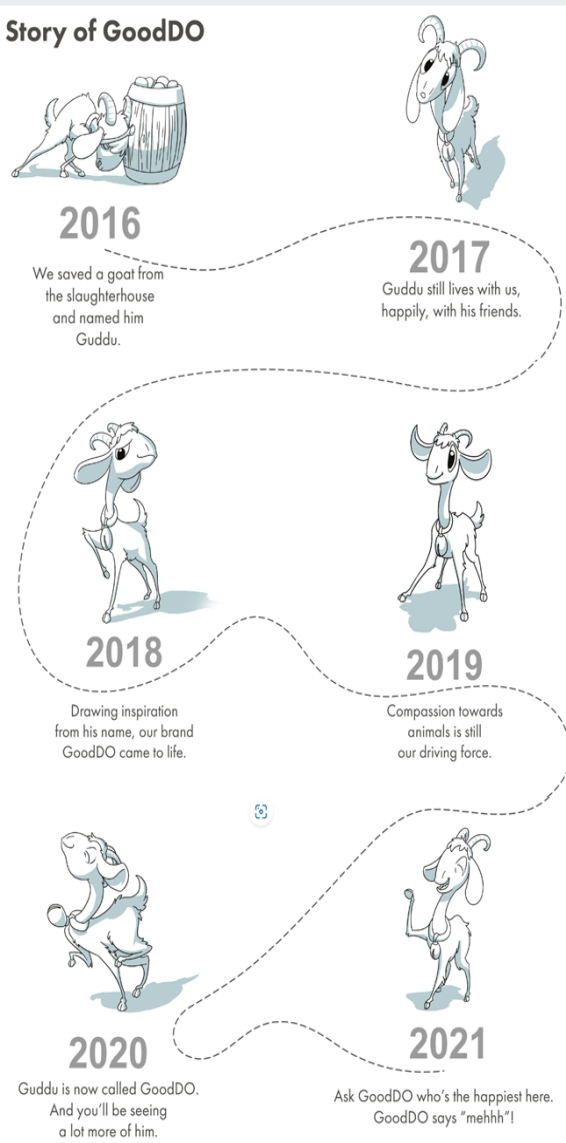
Humor and Accessibility: The company uses humor through their goat mascot and focuses on making their products affordable and readily available.

Target Audience: GoodDo targets a broad audience, including:

- ▶ **Flexitarians:** Individuals looking to reduce their meat consumption for health, ethical, or environmental reasons.
- ▶ **Health-conscious consumers:** People seeking protein-rich and cholesterol-free alternatives.
- ▶ **Environmentally aware individuals:** Those concerned about the impact of animal agriculture on the planet.
- ▶ **Animal welfare advocates:** Consumers who prioritize ethical treatment of animals.



Story of GoodDO



¹⁴ GoodDO - The Vegan Eatery | Best Vegan Food & Vegan Restaurants

Distribution Channels: GoodDo initially started with direct online sales and partnerships with select restaurants. As they grew, they expanded to:

- ▶ E-commerce platforms
- ▶ Modern retail stores
- ▶ Food service channels

Factors Contributing to Success: Several key factors have contributed to GoodDo's success:

- ▶ Delicious and innovative products: Their plant-based offerings cater to diverse palates and satisfy cravings for familiar dishes.
- ▶ Compelling mission and storytelling: Their focus on animal welfare and sustainability resonates with a growing segment of consumers.
- ▶ Effective marketing strategies: Their multi-pronged approach creates brand awareness and connects with their target audience.
- ▶ Focus on affordability and accessibility: They make their products accessible to a wider range of consumers.
- ▶ Strong online presence: They actively engage with their community and create a positive brand image.

Lessons for budding Entrepreneurs:

- ▶ Innovation and Product Development: Focus on creating plant-based meat alternatives that closely mimic the taste and texture of popular dishes.
- ▶ Effective Marketing Strategies: It is important to leverage various channels to reach and engage with consumers effectively. Entrepreneurs can learn from GoodDo's digital presence on social media platforms, collaborations with influencers and restaurants, and impactful storytelling highlighting the ethical and environmental benefits of their products.
- ▶ Target Audience Identification: GoodDo's ability to target a broad audience, including flexitarians, health-conscious consumers, environmentally aware individuals, and animal welfare advocates, showcases the importance of understanding and catering to diverse consumer preferences and motivations.

New technologies in plant-based food production

The plant-based food industry is undergoing a technological revolution, marked by a blend of traditional and cutting-edge methods that enhance product quality, efficiency, and scalability. In the realm of plant-based milk alternatives, homogenization or blending is a common technique, where nuts and seeds are processed into a homogeneous mixture, filtered to achieve a smooth liquid, and sometimes subjected to additional steps like heating or sterilization. High Pressure Processing (HPP) is employed to extend the shelf life of certain plant-based milk alternatives.

Plant-based butters follow a similar production process, involving grinding ingredients into a paste, emulsification for a spreadable consistency, and potential flavoring or fortification. Plant-based meats, a rapidly growing segment, undergo intricate processes such as extrusion, high-pressure homogenization, and heating/cooling. Extrusion technology has seen advancements like dual-screw and co-rotating twin-screw extrusion, high-temperature

short-time (HTST) extrusion, and membrane extrusion, all contributing to enhanced texture and consistency.

High Pressure Processing (HPP) finds application across plant-based foods for preserving taste and texture. Looking ahead, innovation in plant protein is driving the industry forward. Mainstream proteins like soy and peas dominate, but diversification is a key focus for brand owners and ingredient suppliers. Artificial intelligence aids in screening plant sources, ensuring properties that mimic traditional proteins. Despite rising interest in insect and cultured meat, plant-based proteins remain attractive with low production costs, widespread market penetration, and ongoing innovation. Leading manufacturers in this space include ADM, Cargill, Dupont, and Kerry.

The ongoing technological advancements and innovations in plant-based food production not only cater to the growing consumer demand for sustainable and healthful options but also open new avenues for creativity and development in the industry, promising a flavorful and textured plant-based future.¹⁵

¹⁵ [The Rising Plant Based knowledge paper final for approval.pdf \(assochem.org\)](#)

Homogenization

The plant-based milk alternatives are generally made through homogenization or blending. The basic components, including nuts and seeds, are soaked, crushed, and combined with water to form a homogeneous mixture. After that, the mixture is filtered to get a smooth liquid.

High-Pressure Homogenization

It is utilized to produce a meat-like texture, and heating and cooling may be employed to enhance the texture and replicate the cooking behaviour of meats made from animals.

Extrusion Technology

With the rise in demand for meat substitutes made from plants, the most recent extrusion technology for both wet and dry Textured Vegetable Protein (TVP) keeps evolving and getting better.

- ▶ Dual-screw extrusion
- ▶ Co-rotating twin-screw extrusion
- ▶ Membrane extrusion
- ▶ High-temperature short-time (HTST) extrusion

Mycoprotein: a novel plant-based protein source¹⁶

Mycoprotein, derived from fungi like *Fusarium venenatum*, emerges as a promising alternative to plant based protein, offering a sustainable and innovative protein source.

Comparison with other traditional plant-based proteins				
Feature	Mycoprotein	Soybeans	Peas	Lentils
Complete protein	Yes	No	No	No
Fat content	Low	Moderate	Low	Low
Cholesterol	None	No	No	No
Sustainability	High	Moderate	Moderate	Moderate
Taste and texture	Meat-like	Beany	Bland	Nutty
Availability	Low	High	High	High

▶ Complete amino acid profile

▶ Low in fat and cholesterol

▶ Sustainable production

Advantages

Disadvantages

▶ Limited availability

▶ Potential allergens

▶ Taste and texture

Production

- ▶ fermentation process where *Fusarium venenatum* is fed simple sugars
- ▶ The fungus rapidly grows, accumulating protein, harvested, dried, and textured to resemble meat
- ▶ requires less land, water, and resources

Nutritional Profile

- ▶ complete amino acid profile
- ▶ low in fat and cholesterol
- ▶ good source of dietary fiber

Sustainability

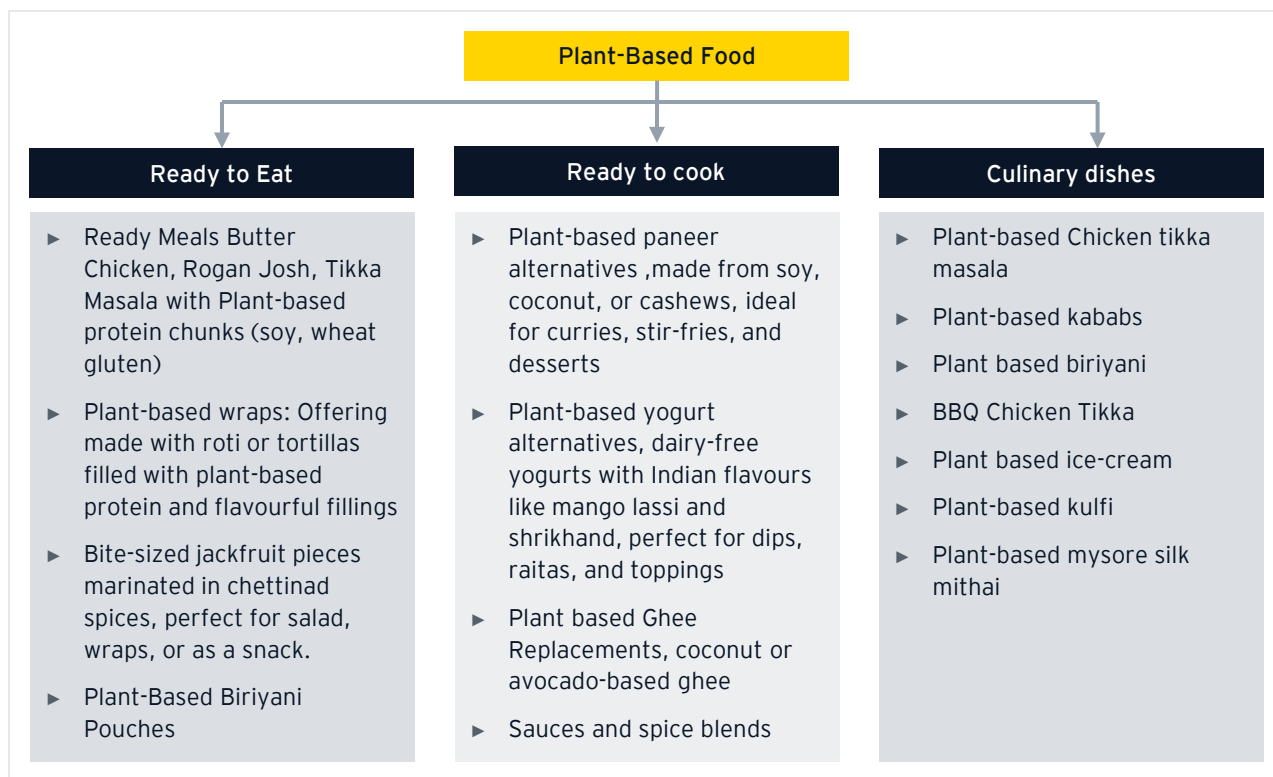
- ▶ production requires less land and water
- ▶ generates fewer greenhouse gas emissions
- ▶ contributes less to deforestation and water pollution

Innovation

- ▶ Mycoprotein is a versatile ingredient that can be textured and flavored to mimic the taste and texture of various meats

¹⁶Fusarium venenatum - an overview | ScienceDirect Topics

Innovative products in the market



04

Strategies for plant-based food ecosystem development

India's rise as an ingredient powerhouse

Amidst a global surge in demand for plant protein, India stands poised to make significant strides in the plant-based foods market, projected to exceed **US\$360 billion by 2030**.¹⁷ However, this upward trajectory presents challenges, as the burgeoning appetite for plant-based foods worldwide consistently outpaces the industry's supply chain capabilities. Forecasts indicate that the demand for plant protein is set to skyrocket to 1 million tonnes by 2032, with a quarter of the projected market share anticipated to come from exports.

Yet, India's more-than-nascent plant-based food industry faces hurdles of its own, grappling with the import of high-quality ingredients and a lack of advanced processing facilities for local materials, leading to elevated costs and restricted availability. Recognizing this, the Protein Cluster initiative aims to transform India into the world's "Global Ingredient Hub", capitalizing on the country's vast agricultural resources and government support. By establishing cutting-edge processing value chains, the cluster will produce premium-quality functional plant proteins from pulses, millets, and coarse grains. Leveraging India's position as a leading pulses producer with great diversity, the initiative will prioritize the production of high-value, protein-rich products using innovative technology, thereby revolutionizing both the domestic and export markets.

The cluster's primary focus revolves around sourcing superior-quality raw materials to provide exceptional ingredients. Utilizing advanced technology, the cluster extracts protein without the use of harsh chemicals, ensuring the delivery of clean-label solutions. This cluster is structured into three distinct segments. Firstly, protein extraction from various raw materials yields plant protein concentrates, hydrolysate, and isolates. Secondly, the extracted protein, combined with other ingredients, undergoes texturization processes, resulting in Texturized vegetable protein (TVP) or high-moisture meat analogues (HMMA) using

¹⁷ Exploring the Growth and Future of the Plant-Based Food Market (futuremarketinsights.com)

adaptable extruders. Lastly, a plug-and-play Central Kitchen model in the third segment provides start-ups and companies with the infrastructure needed to manufacture the final plant-based meat product.

Drawing inspiration from Canada's Plant Protein Cluster, which secured a US\$750 million investment, to propel the nation's leadership in plant protein production, India seeks to replicate this success. By establishing 12 Plant Protein Clusters nationwide with an estimated investment of US\$500 million, India aims to harness government support, industry collaboration, and research investment to realize its potential as a global plant protein powerhouse.

Elevating excellence: superior ingredients for plant-based innovation

In the dynamic landscape of plant-based meat and dairy, the demand for high-quality soybeans is paramount. To meet this demand with precision, the cluster actively seeks out premium IP soybeans sourced from the United States. These soybeans, integral to global food security, boast impeccable taste and unparalleled functionality, setting them apart as essential ingredients for processing. Renowned for their absence of off-taste and rich content of essential fats and amino acids, they form the cornerstone of nutritional excellence. Backed by robust scientific evidence, soybeans showcase their prowess in enhancing heart health and overall well-being, cementing their status as nutritional powerhouses.

By securing access to these superior soybean varieties, the cluster ensures plant-based meat companies have access to top-tier raw materials, empowering them to craft delectable products that meet consumers' expectations for taste and quality. These innovative creations, designed for both domestic enjoyment and international export, aim to captivate discerning palates worldwide.

Moreover, the cluster recognizes the untapped potential of rice protein—a plentiful yet underutilized resource. With its enhanced functionalities, rice protein seamlessly complements other legume-based ingredients, creating a comprehensive amino acid profile. Emphasizing the utilization of locally available raw materials like pulses and millets, the clusters across various regions in India further diversify their ingredients portfolio. Through this holistic approach, the cluster endeavours to elevate the standards of plant-based products, revolutionizing the future of food.



Infrastructure development for industry transformation

Through a cohesive strategy in infrastructure development, coupled with initiatives from diverse Ministries focusing on plant-based foods, the Plant Protein Cluster addresses critical industry challenges. These include bridging the demand-supply gap, meeting capital-intensive manufacturing needs, and establishing a dedicated value chain.

In line with these objectives, the cluster has identified several locations offering unique facilities for growth

and development. Each of these locations provides distinct logistical advantages and specializes in specific commodities. Situated along key transportation routes like the Eastern Dedicated Freight Corridor route and the Delhi-Mumbai Expressway, and in proximity to major ports, these clusters aim to cater to a diverse range of agricultural produce. This includes wheat, pulses, rice, millets, soybean, chickpea, and more, thereby significantly contributing to India's plant-based food production capacity.

Advancing plant-based food infrastructure in India

 Cluster proposal area and locations	 Cluster facilities
Across 12 Indian States, twelve locations have been meticulously selected, collectively offering an annual capacity of 200,000 MT. Chosen based on agricultural data and logistical considerations, these sites include Bhaupur-Kanpur, Uttar Pradesh; Bhiwadi, Rajasthan; Cuttack, Odisha; Dankuni-Kolkata, West Bengal; Hazaribagh, Jharkhand; Jaora-Ratlam, Madhya Pradesh; Kokrajhar, Assam; Nagpur, Maharashtra; Tumakuru, Karnataka; Vadodara, Gujarat; Vellore, Tamil Nadu; and Vijayawada, Andhra Pradesh.	Facilities within the cluster include processing centers, cloud kitchens, value-addition centers, research labs, application labs, training centers, incubation centers, convention centers, farmer's hostels, demonstration plots, bonded warehouses, truck terminals, logistics terminals, and administrative buildings.

The cluster prioritizes resource efficiency by promoting sustainable practices such as repurposing by-products and utilizing locally available raw materials like pulses and millets. It also emphasizes rural development and farmer empowerment by involving farmers in the production process, providing them with a stable market, and boosting economic well-being while curbing rural-to-urban migration. Furthermore, by

producing nutritious plant-based ingredients, the initiative contributes to food security, particularly in regions with growing populations, by lowering raw material costs and enhancing domestic reliability. Through these concerted efforts, India is on the path to becoming a global leader in plant-based innovation, driving progress, sustainability, and economic prosperity.



Plant Protein Cluster Across 12 Indian States			
Identified location	Logistical advancement	Focus commodities	Annual capacity (MT)
Bhaupur-Kanpur, Uttar Pradesh	Along the Eastern Dedicated Freight Corridor route	Wheat, Pulses, and Rice	15,000
Bhiwadi, Rajasthan	Proximity to the Eastern and Western Dedicated Freight Corridor Terminal	Rice, Wheat, Pulses and Millets	30,000
Cuttack, Odisha	Proximity to Pradeep Port	Pulses, Rice, and Jackfruit	10,000
Dankuni-Kolkata, West Bengal	At the Eastern Dedicated Freight Corridor Terminal	Rice and Peanut	15,000
Hazaribagh, Jharkhand	Along the Eastern Dedicated Freight Corridor route Intersection of Nepal-Vizag Highway	Paddy, Chickpea, and Pigeon Pea	15,000
Jaora-Ratlam, Madhya Pradesh	Proximity to Banswara, Ujjain and Indore Proximity to Gujarat-West Bengal connecting Highway. Proximity to Delhi-Mumbai Express way. Proximity to Western Dedicated Freight Corridor	Soyabean, Chickpea and Pigeon Pea.	25,000
Kokrajhar, Assam	Proximity to growing plant-based export markets including Bhutan, Bangladesh and Nepal	Mushroom and Rice	10,000
Nagpur, Maharashtra	Strategically located at the centre enabling Pan India transportation	Pulses and sorghum	15000
Tumakuru, Karnataka	Proximity to Bangaluru	Pulses and Millets (Ragi)	15,000
Vadodara, Gujarat	Along the Delhi-Mumbai Expressway Proximity to Western Dedicated Freight Corridor Proximity to Western Dedicated Freight Corridor	Wheat, Peanut and Pearl Millets	20,000
Vellore, Tamil Nadu	Proximity to Chennai Port	Rice, Pulses, Black Gram, Peanut and Millets	15,000
Vijayawada, Andhra Pradesh	Proximity to Vizag Port	Rice, Oilseeds, Sorghum and Pulses	15,000 ¹⁸



¹⁸ PBFIA

Strategies for plant-based food ecosystem development

An inclusive Strategy is required to boost the industry and open opportunities for existing market players and new entrants. Some of the key strategies at national

level which can boost the plant-based food industry are:



Strategic research initiatives

Positioning itself at the forefront of the burgeoning plant-based foods sector, the Indian Government has a pivotal role in shaping its trajectory through targeted research initiatives. As the sector currently relies heavily on conventional crops, a strategic shift towards indigenous varieties is imperative. In the short term, substantial investments in researching India's native crops can significantly contribute to the sector's growth, both domestically and on the global stage.

Whether in processed or unprocessed forms, plant proteins are poised to play a central role in India's dietary landscape. For unprocessed plant proteins, there is a critical need to invest in high-yielding, climate-friendly crops that align with India's diverse climate and soil conditions. Simultaneously, for processed plant-based foods, emphasizing the nutritional, processing, and taste characteristics of crops is paramount. These factors influence consumer interest and sustained engagement with the products, impacting the overall growth of the sector.

Governments worldwide are channelling resources into research, leveraging federal infrastructure and co-financing mechanisms in collaboration with private enterprises, academia, and civil society. In this context, the Government of India can adopt a diversified investment strategy, capitalizing on its strengths across various sectors. Exploring co-financing opportunities with international organizations aligning with national priorities can further enhance the impact of research initiatives.

To spearhead research and foster sector-wide progress, the establishment of a Centre of Excellence becomes a pivotal strategy. This multi-institutional hub would serve as a catalyst, optimizing the sector for social, environmental, and economic benefits. It would focus on researching crops strategically suited to local conditions and sector requirements, developing enhanced processing technologies, fostering public-private partnerships, engaging in international capacity-building activities, and more. Through these concerted efforts, India can position itself as a trailblazer in the global plant-based foods landscape.

Strategic policies for supportive ecosystem development

Creating a conducive environment for emerging industries requires strategic government policies that not only drive growth but also ensure equitable benefits. The key lies in facilitating innovation and maximizing government investments, ultimately fostering a robust economic engine domestically and positioning the country among the top global exporters.

In the context of the plant-based foods sector in India, four crucial areas demand strategic prioritization. Firstly, bolstering support for the agri-food processing industry emerges as a cornerstone. Secondly, harnessing the power of public procurement and

subsidies can significantly boost the sector's growth trajectory. Trusting consumers' understanding of labels becomes paramount, aligning with the global shift towards more informed and conscious consumption. Lastly, streamlining the evaluation and approval processes for novel ingredients is vital for fostering efficiency and expediting the introduction of innovative products to the market. Through these focused strategies, India can cultivate a thriving ecosystem for plant-based foods, unlocking not only economic prosperity but also contributing to the nation's aspirations of becoming a prominent player in global exports.

Advancing infrastructure for agro-food processing

India, boasting the world's third-largest food processing sector, holds a strategic position to lead in plant-based food processing. The synergy between the agri-food processing industry and the plant-based foods sector is pivotal for mutual success. The growth of plant-based foods not only contributes significantly to the industry but also creates substantial employment opportunities.

Recognizing the escalating global demand for protein isolates, concentrates, flours, and end products, the Government of India can play a pivotal role by making supportive investments. Learning from the experiences of North America and Europe, where the plant-based food sector has witnessed demand surpassing production, India can strategically map agricultural regions to identify crops suitable for supplying the growing plant-based foods industry. This involves identifying crops currently in high demand and anticipating future needs.

Furthermore, the government can actively address gaps in infrastructure, processing capacity,

transportation, and research essential for transitioning agricultural production in India towards climate-friendly crops. This expansion should prioritize processing methods that reduce costs, accommodate a diverse set of ingredients, and align with economic, environmental, and social objectives. Investments in skill development programs are also crucial, ensuring inclusive participation from both formal and informal sectors in the plant-based foods industry, particularly anticipating potential labour market shifts from animal-derived products.

Ongoing support from the Ministry of Food Processing Industry, exemplified by initiatives like Pradhan Manti Kisan Sampada Yojana (PMKSY), provides a solid foundation for future endeavours. To facilitate sectoral growth, the government can establish a dedicated team to assist companies in navigating requirements across departments efficiently. This support is particularly critical for start-ups operating with limited capital, emphasizing the need to bring products to market swiftly for survival.

Streamlining approval processes for innovative ingredients

In propelling innovation within the plant-based food sector, especially harnessing the strengths of Indian crop production, it becomes imperative for the Government to lead efficient evaluation and approval processes for novel ingredients. Recognizing the manifold benefits tied to the industry's expansion, which extends to substantial economic opportunities, the Government of India should commit to ensuring a streamlined process without compromising consumer

safety. The allocation of significant funding to bolster the critical functions of the Food Safety and Standards Authority of India, specifically concerning plant-based foods, should be a priority. A swift and efficient evaluation and approval framework will significantly reduce the time from research and development to realizing returns on investment, thereby fostering accelerated and confident growth within the sector.

Go to market strategy for emerging enterprises

Achieving success in the realm of plant-based products hinges on the quality of ingredients employed. Enhanced production methods, coupled with access to top-tier ingredients, contribute to the creation of enticing and nutritious plant-based foods, delivering the desired experience to consumers.

Upon the introduction of plant-based products, the significance of branding and packaging cannot be overstated. These elements play pivotal roles in determining success. Packaging should not only set the product apart from others in the market but also embody a robust brand identity that effectively communicates the product's values and benefits. Moreover, plant-based food companies need to exercise careful consideration in the selection of logistics and distribution channels. This strategic approach ensures that the product reaches the intended consumer promptly and at a competitive and equitable price.

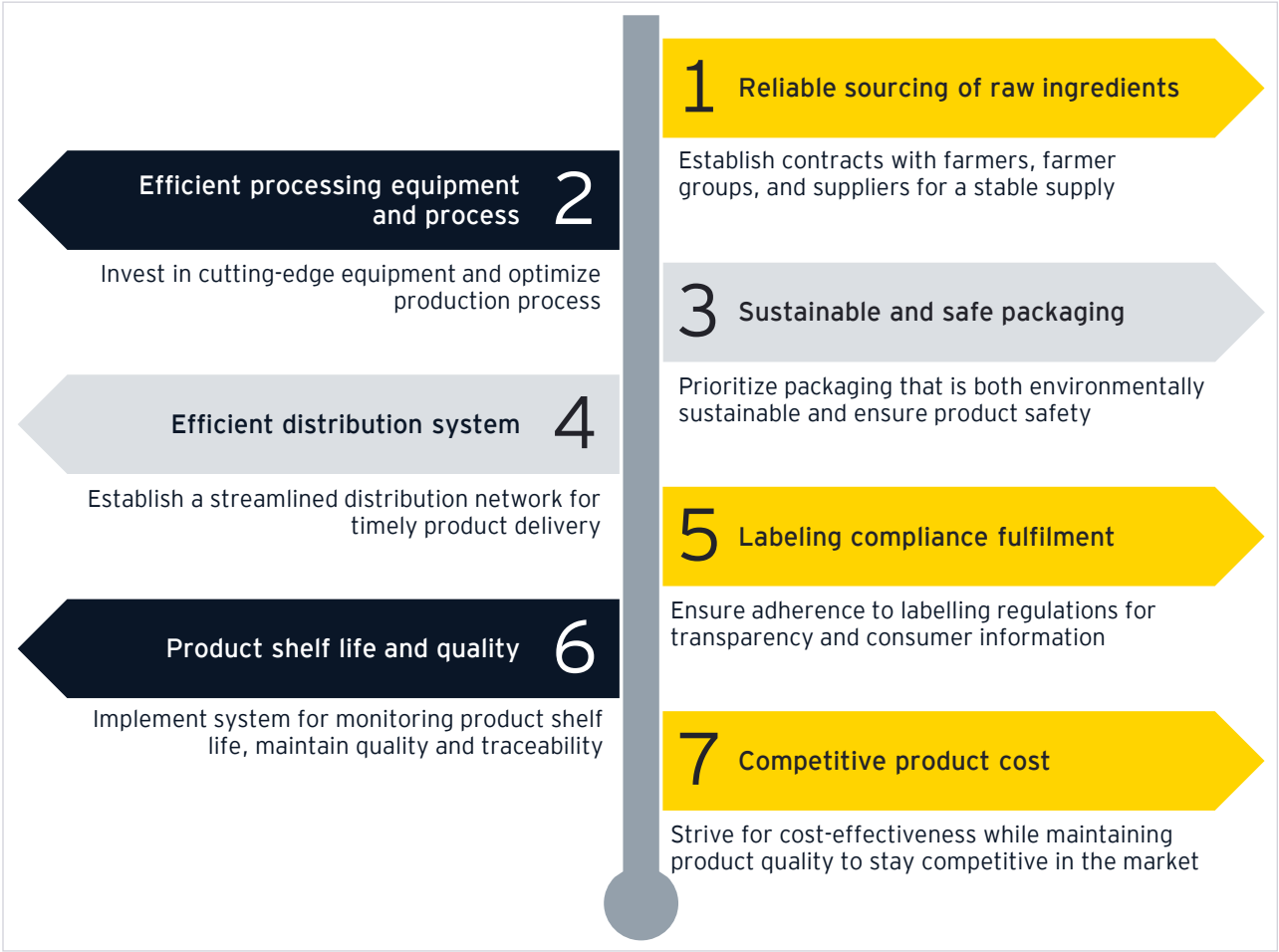


Operational excellence in sourcing and production for plant-based foods

Raw material sourcing:



Production operations:



This comprehensive operational strategy ensures the successful implementation of plant-based food production, aligning with the evolving demands of the market.





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