

Plant-based foods landscape – navigating challenges and opportunities

March 2023

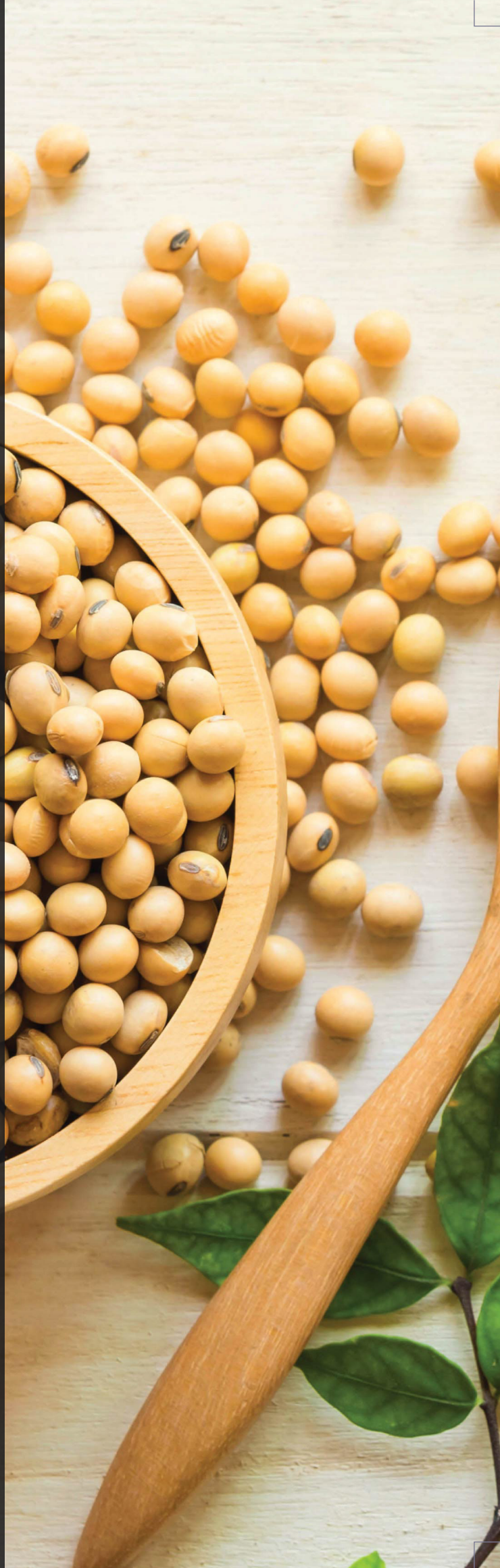


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Foreword

As the world faces unprecedented challenges, such as climate change and growing health concerns, there is an increasing focus on healthy and alternative food systems. Plant-based foods are emerging as a substitute that not only addresses these challenges but also provides a range of business opportunities.

The food industry has traditionally relied on animal-based products, but the tide is turning, and plant-based foods are gaining traction. Consumers are becoming more aware of the environmental and health impacts of their food choices and are increasingly opting for plant-based alternatives. This shift in consumer behavior is driving the growth of plant-based foods and is expected to continue in the years to come.

However, the plant-based food industry is not without its challenges. From sourcing raw materials to developing innovative products and addressing regulatory requirements, there are several hurdles that need to be overcome. The plant-based food industry requires collaboration and innovation from all stakeholders, including businesses, policymakers, and consumers.

This report, "**Plant-based foods landscape – navigating challenges and opportunities**," is a comprehensive analysis of the plant-based food industry, providing detailed analysis of the plant-based food industry, including market trends, consumer preferences, and regulatory landscape. The report explores the challenges faced by the businesses in this sector and also highlights the opportunities that exist for businesses, including the potential for innovation and collaboration across the value chain.

We hope that this report will serve as a valuable resource for businesses and policymakers looking to navigate the plant-based food landscape and harness the opportunities presented by this growing industry. We believe that by working together, we can build a sustainable and healthy food system for all.

EY is committed to helping businesses adapt to the changing food landscape and harness the opportunities presented by plant-based foods. We hope this report will contribute to the ongoing dialogue and accelerate the adoption of plant-based foods as a sustainable and healthy food choice for all.



Rajiv Memani

Chairman & Regional
Managing Partner,
EY India

Foreword

The existing world is grappling with the problems of hunger, malnutrition and environmental degradation, often linked to the food system. Over 150 million children under five years of age, according to World Food Programme, suffer from stunted growth as a result of Protein Energy Malnutrition (PEM). Further, in the last one decade, the food preferences have undergone multiple and diverse changes impacting the market share of different categories of foods.

There has been an increasing interest in plant-based diets, with many people adding more plant-based foods into their daily meals and adopting a fully vegan or vegetarian lifestyle. According to the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), an average of 68% of the world's population are lactose intolerant. This offers potential markets for dairy alternatives and plant-based protein substitutes to cater to the growing lactose-intolerant/vegan population. Also, with growing urbanisation and increase in purchasing power, there is an opportunity for the plant-based food market to grow.

I am delighted to present this report which touches upon the Global and Indian trends of the plant-based food market, challenges faced by the different players and potential opportunities in the industry.

The report is expected to shed light on the various options that are available and how they may impact the ecosystem as a whole. I'm hopeful that the report will provide a comprehensive overview of the sector and its potential, offering valuable insights to all stakeholders involved.



Amit Vatsyayan

Partner Business Consulting,
Leader GPS-Agriculture,
Livelihood, Social and Skills
EY LLP



Foreword

The food industry has displayed its potential to quickly evolve and innovate to cater to the rising consumer demand for plant-based foods that are healthier and more ecologically responsible. This innovation may reduce some of the strain on the global food system by providing much needed protein to the developing nations and reduce meat intake in developed nations, both of which are crucial to create a just and sustainable food system. A large customer base of flexitarians has started moving towards plant-based food products in recent years. The rise in the demand for plant-based foods is strongly reflected in the double-digit increase in the number of searches for vegan, plant-based, and cruelty-free products. Plant-based foods sector is still at the dawn phase, but it has an enormous potential to revolutionize the entire foods industry.

While it is true that plant-based products have always existed, the novel range of products is full of innovation, and we are inching closer to achieving the true sensorial characteristics of animal-based products. Consumers view-cost as a prime obstacle to purchasing plant-based products regularly. Additionally, flavor and texture also play a significant role in influencing consumers' purchase decisions. As a result, the industry's expansion is dependent on continued funding for Research & Development, support from the Government, active participation of the academia and scientists, which would also guarantee that the sector, which has the potential to eventually generate a sizable number of jobs, doesn't go under and keeps innovating.

Go to Market obstacles can soon be eliminated because the interests of the HoReCa and retail sectors are growing in this category. Additionally, well-established competitors are expanding their distribution of plant-based products and investing heavily in R&D so they can leverage the first mover advantage. As consumers become more aware of the category and find plant-based food products regularly in retail shelves and food services, changes in consumer behavior are anticipated in next few years.

The market for plant-based foods is at crossroads, where strong government support can contribute to the effort to boost the economy as a whole and help the sector realize its full potential. We ought not to wait to take any action to seize this opportunity for our nation's economic development, 2070 Net Zero target, to tackle protein deficiency and also pave the way for world food and nutrition security.

I am happy to collaborate with Ernst & Young on this report, which discusses the major, real-time industry insights about the current trends, challenges and steps forward for the plant-based foods sector. Various development drivers from government, regulators, investors and entrepreneurs can create new opportunities in the market, to expand plant-based foods industry that will benefit farmers, start-ups, research institutions and the food ecosystem as a whole.



A stylized, handwritten signature in black ink, appearing to read 'S. Sethi'.

Sanjay Sethi

Executive Director
Plant Based Foods Industry Association



An aerial photograph of a lush green agricultural field, likely a soybean field, with a tractor visible in the lower-left corner. The field is divided into rows, and the tractor is moving through them, leaving tracks in the soil. The overall scene is vibrant and green, with some yellowish-brown patches indicating harvested areas or different crop stages.

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Executive summary

The food industry has witnessed a shift towards plant-based diets in recent years. The global plant-based food market is expected to reach US\$162 billion by 2030, up from US\$29.4 billion in 2020 with a CAGR of 18.60% from 2020 to 2030¹.

The plant-based food landscape can be broadly divided into three categories: plant-based foods, plant-based processed foods, and plant-based protein alternatives. Plant-based foods refer to whole, unprocessed plant foods such as fruits, vegetables, nuts, and grains. Plant-based processed foods include products such as plant-based milk, cheese, yogurt, and ice cream. Finally, plant-based protein alternatives such as plant-based meat, seafood, and eggs are gaining traction as consumers seek out alternatives to traditional/animal protein.

The plant-based food landscape presents both challenges and opportunities for food manufacturers, retailers, and marketers. Challenges include issues related to taste, texture, and sensory experience of plant-based products, regulatory hurdles, and supply chain constraints. Opportunities include expanding product portfolios to create new demand/meet existing demand, leveraging technological innovations to

improve product quality and sustainability, and capturing the attention of the growing segment of health-conscious and environmentally aware consumers.

While the plant-based food market presents numerous opportunities, it also presents several challenges. These include issues related to taste, texture, and sensory experience of plant-based products, regulatory hurdles, and supply chain constraints. Furthermore, as demand for plant-based products continues to grow, it is becoming increasingly important for food manufacturers, retailers, and marketers to find ways to stand out in a crowded market.

This report explores the current state of the plant-based food landscape, with a focus on plant-based processed foods and protein alternatives. An attempt has been made to analyse the drivers of growth and demand in these categories, major challenges facing the industry, and opportunities for innovation and growth. Additionally, regulatory and policy developments that are impacting the plant-based food industry have been briefly discussed and recommendations that can be viable for navigating the challenges and opportunities in this evolving market.

¹ Source: Bloomberg Intelligence.



Introduction

The food system is a multifaceted and interrelated network influenced by factors like population expansion, technological advancements, economic circumstances, and governmental policies. The existing world is grappling with problems of hunger, malnutrition and environmental degradation which are often linked to the food system. Global hunger and malnutrition are, in fact, significant public health problems that affect millions of people around the world. According to United Nations², there has been a rise in global hunger since 2015. In 2021, it was estimated that there were 690 million people suffering from hunger, an increase of around 60 million people compared to the previous year. The regions most affected by hunger are Africa, where one in four people are undernourished, and Asia, where one in six people are undernourished. Other regions such as Latin America and the Caribbean also face significant levels of hunger, with one in eight people undernourished. In addition to the number of people experiencing hunger, the COVID-19 pandemic has also contributed to an increase in the number of people experiencing food insecurity. The pandemic disrupted food supply chains and made it difficult for many people to afford and access food.

With the global crisis looming above us- the rising inflation in several prominent nations, war and conflicts in many regions, the cost of food has increased substantially affecting the accessibility and affordability of the food.

The world's population is rapidly growing and is expected to reach 9.7 billion by 2050. Feeding the global population with traditional methods of producing food may not prove to be sustainable, and new ways of producing food and varied food choices that are environmentally friendly and healthy has to be adopted. Moreover, with this increasing population and

growing urbanisation, the demand and choices for food will also increase.

Further, rising prevalence of lactose intolerance (about 68 percent of the world's population has lactose malabsorption)³ and increasing adoption to a vegetarian and vegan diet among the masses has also led to the changes in the food preferences. This may result in popularity of plant-based products as they offer alternative food choices that are free from lactose and animal-based products.

The market for plant-based foods has been growing rapidly in recent years⁴, driven by a combination of factors including health concerns, environmental awareness, and changing consumer preferences. The trend towards plant-based diets and alternative proteins has been gaining momentum globally, and the market is projected to continue to grow in the coming years. According to a study by University of Bath⁵, plant-based foods "offer a healthier and environmentally sustainable option" to consumers.

It is estimated that the global **market for plant-based protein** is projected to reach US\$26.71 billion by 2030 from US\$11.10 billion in 2020, with a compound annual growth rate (CAGR) of 9.1% from 2020 to 2030⁶. North America offers the largest market for plant-based protein, followed by Europe and Asia-Pacific. The **market for plant-based meat substitutes** was valued at US\$9.9 billion in 2020 and is expected to expand at a compound annual growth rate (CAGR) of 42.1% from 2020 to 2030⁷.

Overall, the market for plant-based foods is expected to continue to grow as consumers increasingly seek out healthier and alternative food choices. Innovations in ingredients, capital investment, democratizing of technology, support systems for entrepreneurial development may significantly contribute to the growth of plant-based foods.

² The State of Food Security and Nutrition in the World 2022 Report, FAO

³ Storhaug CL, Fosse SK, Fadnes LT. Country, regional, and global estimates for lactose malabsorption in adults: a systematic review and meta-analysis. *The Lancet. Gastroenterology & Hepatology*. 2017;2(10):738-746.

⁴ Bloomberg Intelligence report on Plant-Based Foods Poised for Explosive Growth, 2021

⁵ Bryant, CJ, "Plant-based animal product alternatives are healthier and more environmentally sustainable than animal products" (*Future Foods* 2022, 6, 100174)

⁶ Report by MarketsandMarkets, global market research and consulting firm with HQ in India

⁷ Grand view research report "Meat Substitute Market Size, Share & Trends Analysis", 2022 - 2030

1

Plant-based foods and global trend of plant-based diets

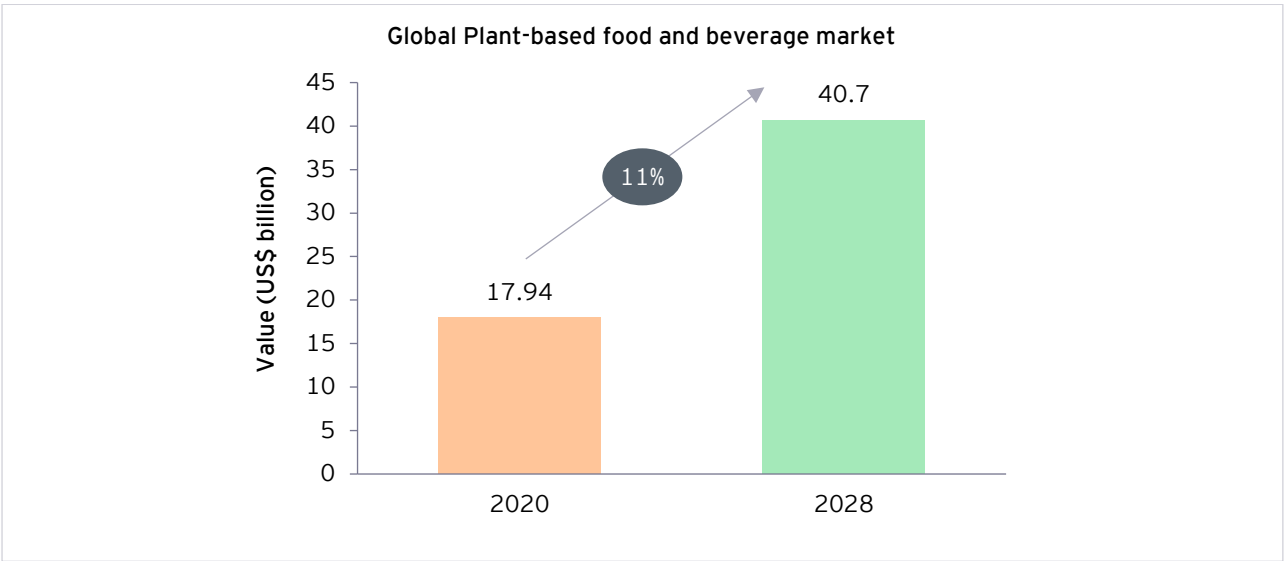
Plant-based foods consist of processed fruits, vegetables, whole grains, legumes, nuts and seeds, herbs, and spices and excludes all animal products, including red meat, poultry, fish, eggs, and dairy products⁸. Whole-food plant-based (WFPB), processed plant-based foods, and plant-based proteins share common elements. While the plant-based proteins may include relatively more processed imitation meats and cheese; a WFPB diet eschews these products in favor of whole or minimally processed, close-to-nature foods that makes it easy to meet nutritional needs.

Plant-based foods could potentially provide optimal food substitute solutions for the global food system. Currently, the global plant-based food market is concentrated in North America, Europe, Asia-Pacific, Latin America, and the Middle East and Africa. It is anticipated that North America may hold majority market share for plant-based foods in forthcoming years attributed to factors like relatively higher consumer awareness for high-value protein diets,

higher adoption of technological advancements in the food and beverage industry, and significant investments in the plant-based sector⁹.

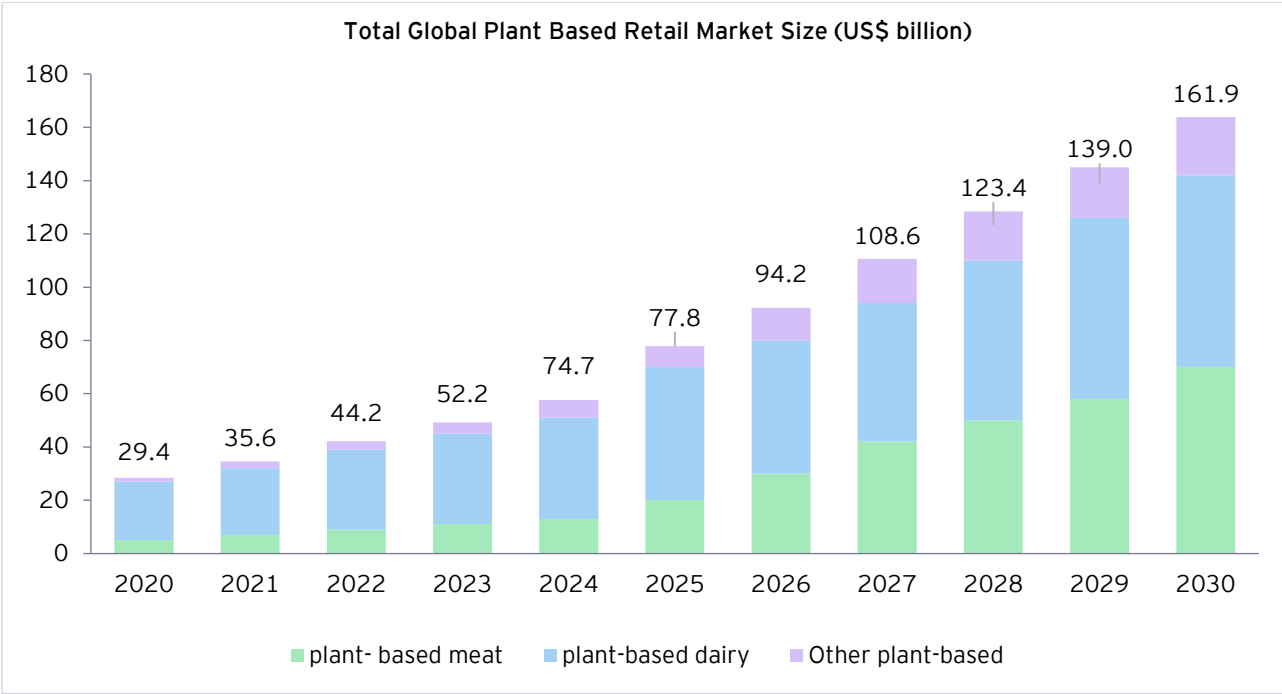
There has been a marked increase in the prevalence of plant-based diets globally. This phenomenon may be attributed to a confluence of factors, including the improved health outcomes associated with plant-based diets, increased awareness of animal welfare issues, growing consumer preference for a vegan and vegetarian diet.

Plant-based food segment is, globally, valued at around US\$5.6 billion. The segment is projected to cross US\$40 billion by the year 2030 with a CAGR of 22%. Under this, plant-based chicken category is estimated to US\$8,500 million in 2030 from US\$1,700 million in 2021. It is projected, by the year 2030, plant-based food market may be led by 'plant-based beef category', which is likely to be followed by 'plant-based pork' and 'plant-based chicken'.



⁸ Ostfeld, Robert J, Allen E Kathleen, A plant-based diet and cardiovascular disease, J Geriatr Cardiol. 2017 May; 14(5): 315

⁹ Data Bridge Market Research Report on Global Plant Based Protein Market - Industry Trends and Forecast to 2028



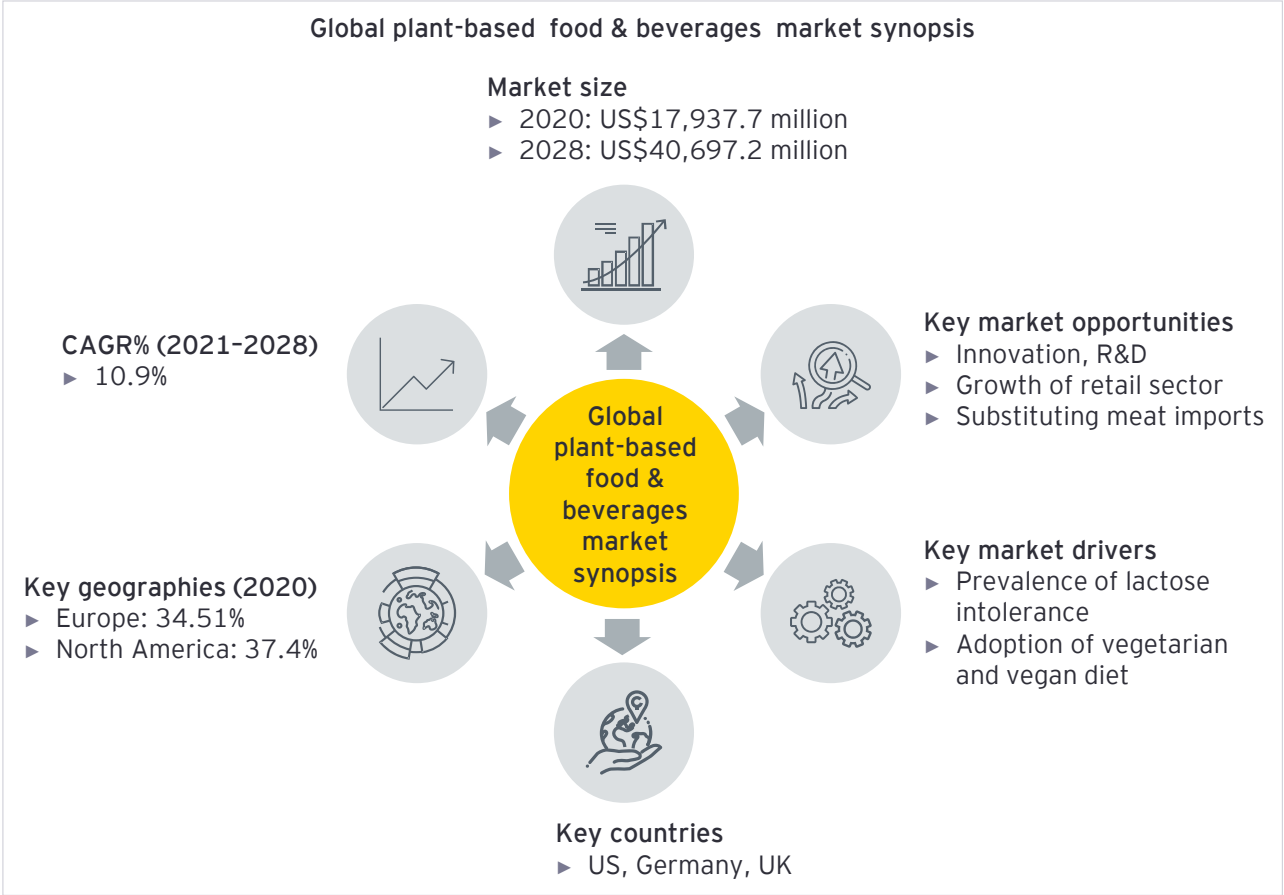
Source: Bloomberg Intelligence, OECD FAO Agricultural Outlook 2021-2030, GFI 2020 State of the Industry Report

In the U.S., plant-based food sales grew by 9% in 2020, reaching a total of around US\$5.1 billion. The plant-based meat market is projected to reach US\$1.64 billion by 2028. It is expected that plant-based food market in US may grow at compound annual growth rate (CAGR) of 10.8 % from 2021 to 2028 reaching around US\$11.5 billion in 2028. In Europe, it is estimated that about 20% of the population is vegetarian and the demand for plant-based meat alternatives is increasing. The European plant-based meat market size was valued at around US\$3.7 billion in 2020 and is expected to expand at a CAGR of 9.7% from 2021 to 2028. In Asia, China and India are

leading the growth in the demand for plant-based foods. China's plant-based food market is expected to reach around US\$1.94 billion by 2028, driven by rising health and environmental concerns while India's plant-based food market is projected to reach around US\$1.7 billion by 2028¹⁰.

The above trend indicates the global plant-based food market is growing rapidly, driven by a growing awareness of the benefits of plant-based diets, as well as relatively increasing availability and affordability of plant-based meat alternatives.

¹⁰ Global Plant-Based Food & Beverages Market Research Report Forecast to 2028





2

Overview of plant-based foods in India

India is a booming market for plant-based foods. The plant-based food industry is expected to experience growth in India due to the increasing urbanization and wealth in the country. Studies have shown that the younger generation of Indians is relatively more open to experimenting with plant-based foods and meat alternatives and increasing availability of these products in the market is expected to make them more accessible.

The vegetarian population in India is comparatively large (around 30%), and there is a growing awareness of the health and environmental benefits of plant-based diets. Additionally, more Indian consumers are looking for sustainable food options. The plant-based food market in India is projected to grow at a CAGR of 11.8% between 2021 and 2028.

2.1 India's agro climatic diversity a plus

India has the potential to be a major player in the global plant-based market, due to its diverse agro-climatic conditions, which allow for the cultivation of a wide range of crops. According to a study by the Indian Council of Agricultural Research¹¹, there is potential to increase pulse production in India by up to 40% through improved agronomic practices and technological interventions. In the future, a strategically viable agricultural system is expected to feed 1.5 billion people by 2050.

India is already a major producer of plant-based food such as lentils, chickpeas, and soybeans, and is home to a large and growing food processing industry. This presents an opportunity for the country to develop and export a wide range of plant-based foods to meet the growing global demand. The vast landmass and varied agro-climatic conditions also make India a preferred country for crop diversification, that can be a significant advantage for plant-based foods. The crop diversification can benefit plant-based foods in India by

offering increased variety of crops as well as improved nutrition addressing issues related food security, nutrition, and sustainability.

The country has a wide range of climate, from tropical to temperate, and a variety of soil types, which allow for the cultivation of a wide range of crops. This diversity can be seen in the variety of plant-based protein sources that are grown and consumed in India, such as lentils, chickpeas, soybeans, and many more.

The tropical and subtropical regions of India are well suited for the cultivation of legumes, such as lentils, chickpeas, and beans, which are an important source of plant-based protein. In the northern and western regions of India, where the climate is more arid, crops such as pearl millet, sorghum, and bajra, which are rich in protein, are grown. In the coastal regions, fish and other seafood are an important source of protein, while in the hilly regions, millets and other small grains are grown.

Production of Plant Proteins in India (2020)			
Crop	Production (million tons)	Global Rank	% Global production
Chickpeas	11.1	1	73%
Millet	12.5	1	41%
Green Peas	5.7	2	29%

¹¹ Potential to enhance pulse production in India." Indian Council of Agricultural Research (ICAR), Ministry of Agriculture and Farmers Welfare, Government of India, 2018

Production of Plant Proteins in India (2020)			
Crop	Production (million tons)	Global Rank	% Global production
Rice (paddy)	178.3	2	24%
Lentils	1.2	2	18%
Wheat	107.6	2	14%
Soybeans	11.2	5	3%

In the recent years, there has been a growing interest in promoting the cultivation of alternative protein sources such as quinoa, hemp, and lupin, which are well-suited to different agro-climatic zones in India, for example, Quinoa can be grown in the hilly regions and arid zones, hemp can be grown in the warmer regions and lupin can be grown in the temperate regions.

Additionally, the diverse agro-climatic regions of India also provide opportunities for the development of different processing and value-added technologies for plant-based protein sources, thus making them more appealing and accessible to consumers. Further, India has a large and growing food processing industry,

which can help to develop and export a wide range of plant-based protein products. These products can cater to the growing global demand for plant-based protein products.

However, there are also some challenges that need to be addressed to make India a feeding bowl for the world for plant-based foods. These include improving the taste and texture of plant-based protein sources, increasing awareness and education about plant-based proteins, and addressing issues such as limited availability, production, and processing, and allergenicity.

2.2 Potential market opportunities for plant-based foods in India

The urban population in India is expected to reach around 600 million by 2030, which presents a large potential market for plant-based food products. The plant-based food companies in India may tap into the growing demand for healthy, sustainable, and convenient food options. Urban consumers in India are becoming increasingly health-conscious and interested in plant-based protein alternatives. Plant-based milk alternatives, meat substitutes, and plant-based protein bars and snacks are relatively popular options among urban consumers in India. One of the advantages of plant-based food business in India is the diversity of the Indian cuisine, which can be used to create a wide variety of plant-based products that cater to the local taste preferences. For example, plant-based meat substitutes can be developed for popular Indian dishes such as biryani or kebabs. Another advantage is the availability of raw materials in India. Many plant-based food products require ingredients such as legumes, cereals, fruits, and vegetables, which are abundantly available in India. This may help to reduce the production costs and make plant-based food products more affordable.

India is a major exporter of various food products such as rice, spices, and fruits and vegetables, and the

plant-based food industry presents an opportunity for further export growth. One advantage for the export of plant-based foods from India is its diverse agriculture and abundant raw material availability, such as legumes, cereals, fruits, and vegetables, which can be used to create a wide variety of plant-based products. India is the world's largest producer of pulses, which are an important ingredient in many plant-based meat alternatives.

India's export potential is also supported by the government's efforts to promote the country as a destination for investment in the food processing industry. The government has introduced various initiatives to encourage foreign investment, such as tax incentives and streamlined regulatory processes. This creates an environment that is conducive for the development of export-oriented plant-based food companies.

Moreover, Indian cuisine has a rich tradition of vegetarian and vegan food, which can be used to create plant-based versions of traditional Indian dishes for export to other countries.

3

Plant based foods – challenges and opportunities

Plant-based foods offer several opportunities for food companies, entrepreneurs, and consumers alike. These opportunities include alternative food choices, health benefits, and the potential for innovation in product

development. However, the plant-based food industry also presents several challenges, such as regulatory hurdles, taste and texture limitations, and competition from traditional animal-based products:

3.1 Challenges

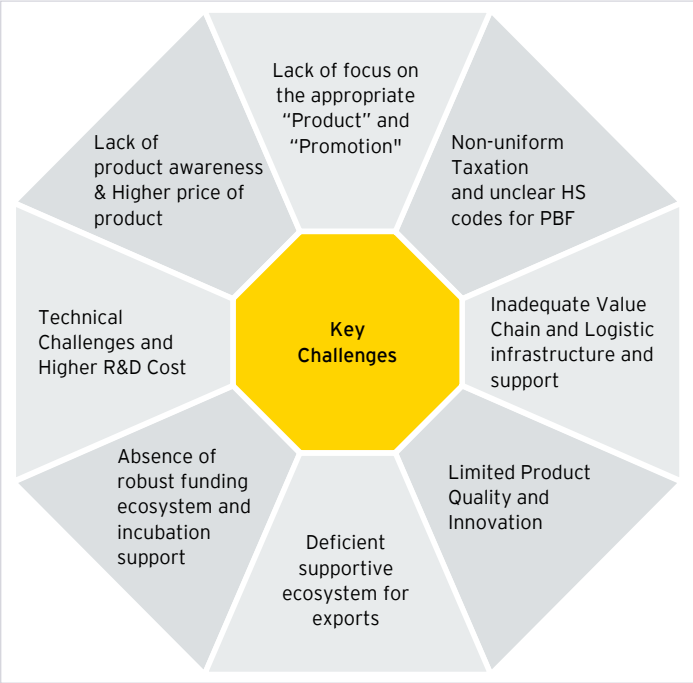
The ‘plant-based foods’ have a multitude of benefits, but there are various challenges in promotion and consumption.

The meat and dairy industries have been around for centuries and have a well-established infrastructure and supply chain. As plant-based products become more popular, traditional meat and dairy producers may produce their own plant-based alternatives, which could create competition for the plant-based industry.

With the buzz created with cultured and lab-grown meat and dairy products, the plant-based food market may also face a competition from these food categories. Many consumers are unaware of the products or their benefits and may not be used to the taste and texture of plant-based options and, thus, hesitant to try them.

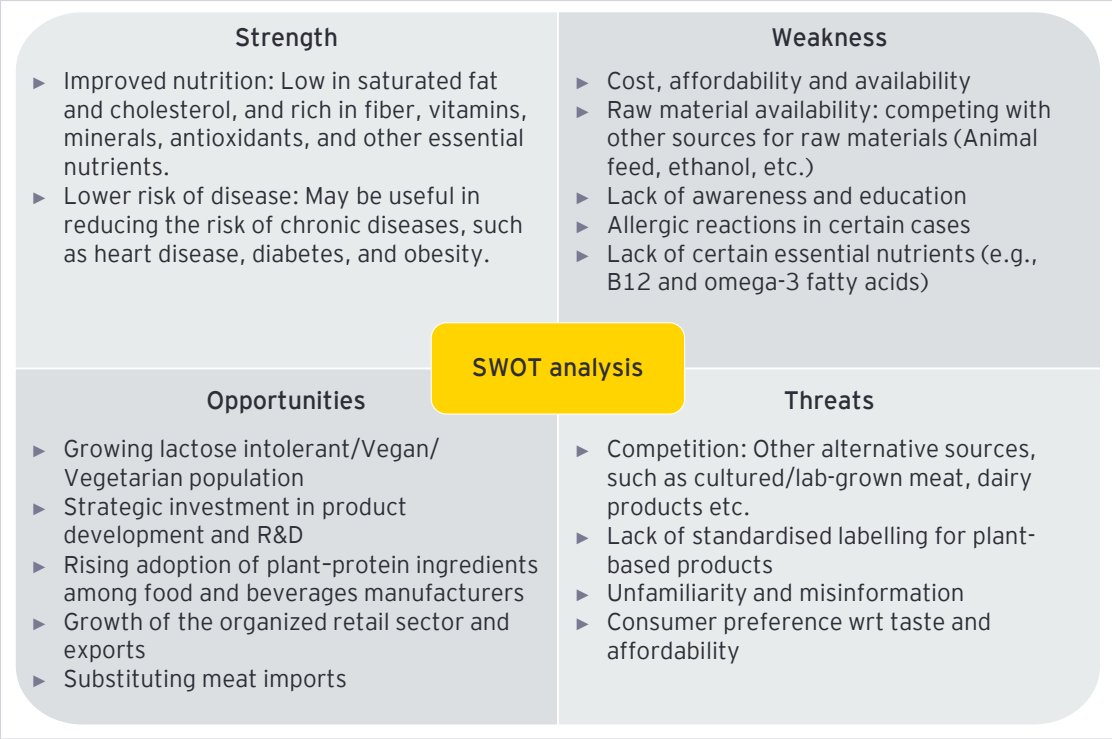
Higher prices, lack of variety, and the limited distribution of plant-based food may be a barrier for some consumers. The price of plant-based meat on average is 30% to 40% percent higher than conventional meat products.

Lack of suitable processing facilities and infrastructure for the value-addition of locally available raw materials makes start-ups dependent on imports, which are itself in short supply and exorbitantly priced, making plant-



based products expensive. Also, technical challenges pertaining to perceived taste, texture, processing, functionality, and digestibility in some plant-based foods pose challenges to the adaptability and acceptability of these foods. Lack of suitable supply chain arrangement and limited availability of high-quality ingredients for plant-based food is challenging.

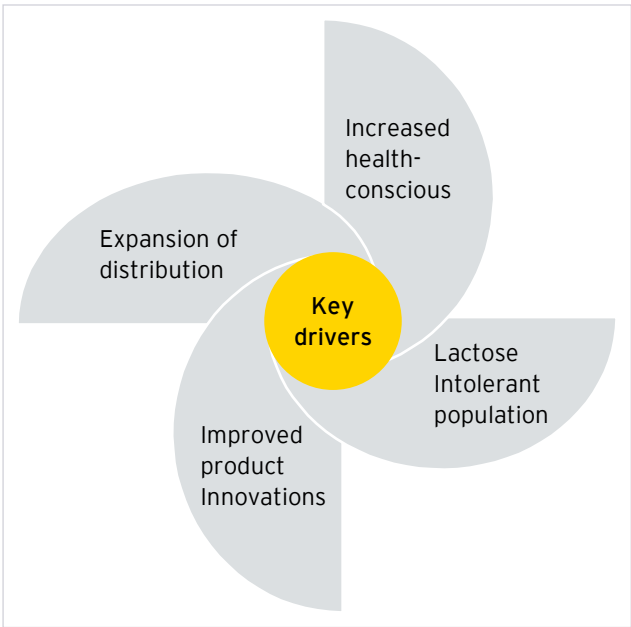
3.2 SWOT analysis



3.3 Emerging opportunities in the plant-based food market

The plant-based food market is rapidly expanding, and there are several emerging opportunities that are driving growth in this sector. Consumers are getting increasingly interested in plant-based foods due to health and nutritional benefits. In recent years, the popularity of plant-based foods has grown significantly, driven in part by factors like lactose intolerance and a shift towards vegetarian and vegan diets. Lactose intolerance affects a large portion of the population, with symptoms ranging from mild discomfort to severe digestive issues. As a result, many people are turning to plant-based alternatives to dairy products, such as almond milk, soy milk, and tofu.

Overall, the plant-based food market is ripe with opportunities, as consumers increasingly seek out healthy and sustainable food options. As the market continues to expand and innovate, there will likely be many new opportunities for growth and investment. To unlock this market and explore the untapped potential, mass awareness creation, promotion of a product by a suitable marketing mix, expansion of distribution, and



development of an appropriate product mix are required.

Plant-based food companies have the opportunity to develop new plant-based products to meet consumers' perceived taste, texture, and flavors. Key factors for generating demand are improved taste, price parity, health benefits, and sustainability.

Plant-based meat, plant-based seafood alternatives, plant-based- milk, yogurt, cheese and ice cream, plant-based snacks, plant-based meal replacements, plant-

based fast food, and plant-based ingredients are becoming increasingly popular as consumers are looking for healthier and sustainable alternatives hence there is plenty of room for growth.

Key catalysts for growth include improved R&D facility, increased distribution network, manufacturing capacity expansion, and raw material availability.

3.4 Market segmentation for plant-based foods in India

India is a diverse country with a wide range of climates, cultures, and cuisines and the plant-based food market

may be categorized into below mentioned broader heads:

By type	By source	By distribution channel
▶ Plant-based milk and derivatives (viz. Milk, Cheese, Yogurt, Butter, Ice Cream, Creamer, Others) ▶ Plant-based meat (viz. Burger Patties, Tempeh, Hot Dogs and Sausages, Seitan, Meatballs, Ground Meat, Nuggets, Crumbles, Shreds, Others), ▶ Meals ▶ Bakery and Confectionery ▶ Sweet and Savory Snacks ▶ Ready To Drink Beverages (Like Tea and Coffee) ▶ Egg Substitutes ▶ Seafood Substitutes ▶ Others	▶ Soy ▶ Almond ▶ Wheat ▶ Pea ▶ Rice ▶ Coconut ▶ Cashew ▶ Others	▶ Business to Business (B2B) ▶ Business to Customers (B2C) ▶ Modern Groceries ▶ Convenience Store ▶ Specialty Store ▶ Online Retail ▶ Hotel, Restaurant, Café (HoReCa)

Plant-based foods may attract health-conscious, vegan, vegetarian consumers looking to reduce their intake of meat and change their dietary preference to plant-based diets. Plant-based milk and derivatives segment may be an alternative source of protein for the rising lactose-intolerant and vegan population.

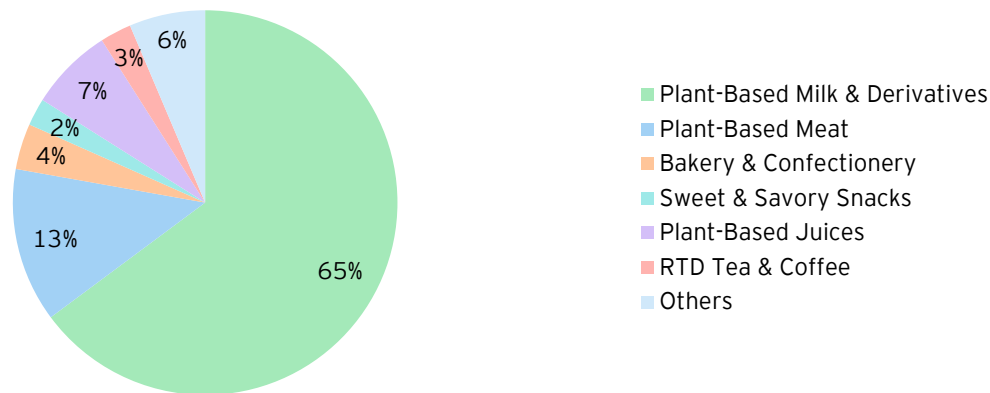
The plant-based milk & derivatives segment accounted for the largest market share of about 65%, with a market value of around US\$500 million in 2021 and it is expected to register a CAGR of 11.64% in the period 2021-2028. The plant-based meat segment was valued at around US\$100 million in 2021 and is expected to grow at a CAGR of 12.36% during the same period. The soy segment accounted for 22% of India's plant-based

food & beverages market by source and was valued at around US\$169 million in 2021 and it is projected to exhibit a CAGR of 11.54% in the period 2021-2028. During the same period the pea segment is expected to exhibit a CAGR of 12.48%.¹²

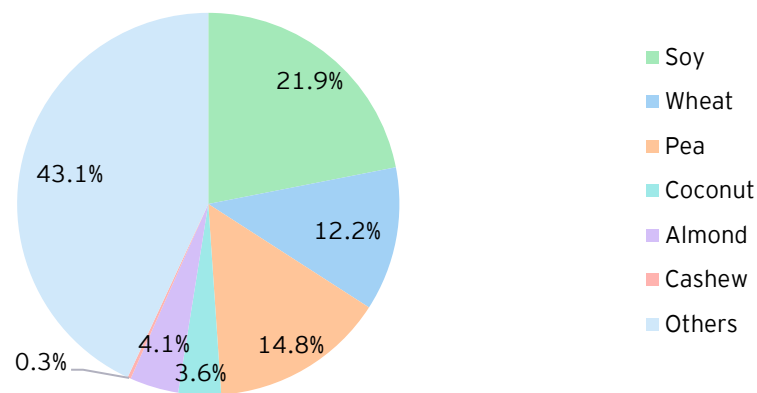
The conventional segment accounted for a larger market share of 87%, in India's plant-based food & beverages market, by category with a market value of around US\$670 million in 2021 and it is expected to register a CAGR of 11.8% during the period 2021-2028. The organic segment was valued at US\$101.7 million in 2020 and is expected to exhibit a higher CAGR of 12.47% in the same period.

¹² Global Plant-Based Food & Beverages Market Research Report Forecast to 2028

India: plant-based food & beverages market, by product type, 2021



India: plant-based food & beverages market, by source, 2021

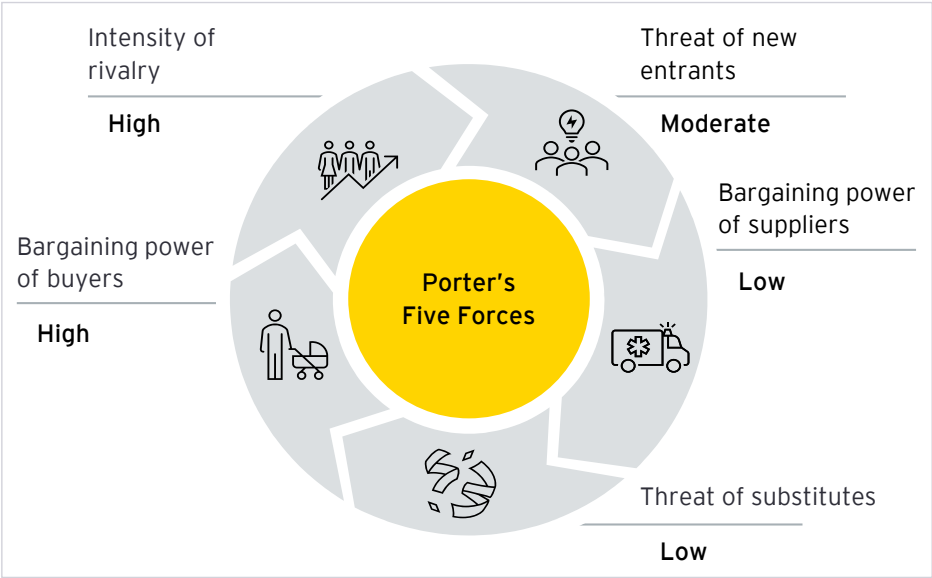


Source: Global plant-based food & beverage market research report, Market Research Future

3.5 Porter's five forces analysis of the global plant-based food & beverages market

The Five Forces analysis for the global plant-based food & beverages market may assist in comprehending the competitive forces that play in plant-based food industries and may assist companies in gaining a competitive edge.

- 1. Bargaining power of suppliers:** The bargaining power of suppliers is low in the global plant-based food & beverages market. There are several suppliers having a cross-regional presence in the plant-based food & beverages market, who may supply the required ingredients to the manufacturers. This may reduce the operational risk and provides an opportunity for the manufacturer to switch to an alternate supplier at lower rates.
- 2. Bargaining power of buyers:** The growing demand for plant-based food products may give buyers more bargaining power. They can demand lower prices and higher quality, and easily switch to alternative products if they are not satisfied. The rise of online shopping and direct-to-consumer sales may also contribute to increased buyer power.
- 3. Threat of new entrants:** The plant-based food industry has seen a surge in new entrants in recent years, driven by growing consumer interest in alternative food options. However, the high level of competition and the need for significant investment in research, development,



and marketing may deter some new entrants from entering the market. The threat of new entrants is, therefore, moderate in the global plant-based food & beverages market since the market is highly competitive having several established brands and recognition.

- 4. Threat of substitutes:** The threat of substitutes is moderate in the global plant-based food & beverages market. Plant-based food and beverage products have relatively fewer close substitutes available. There might be the availability of another substitute at the ingredient level as per consumer preference due to several factors.
- 5. Competitive rivalry:** The plant-based food industry is competitive, with both established food companies and startups vying for market share. Companies must constantly innovate and differentiate themselves to stay ahead of the competition.



4

Strategies for implementing plant-based foods in a business

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 may boost the plant-based food industry are:

- ▶ Democratizing technology by giving incentives to companies to bring manufacturing units in India
- ▶ Catalyzing R&D by establishment of state-of-the-art Centre of Excellence
- ▶ Infrastructure development through initiatives like Common Services Centres
- ▶ Facilitating access to markets
- ▶ Support start-up with the establishment of Entrepreneurial Development Cell
- ▶ Provide government incentives and support to attract investors
- ▶ Reducing restrictions on GST rates
- ▶ Making HS codes clear
- ▶ Making regulation and guidelines across the value chain of plant-based food



A few of the aforementioned strategies are described below:

a. Catalyzing R&D in plant-based food

Currently, plant-based food-focused Indian players primarily offer Ready to eat (RTE) and Ready to cook (RTC) plant-based foods such as nuggets, burgers, sausages etc. There is a requirement of customized products for the Indian palate and tapping into local/regional meat/dairy dishes, to get the right taste, texture, smell, nutritional value, and health aspects while keeping the price parity in mind.

The absence of research and development facilities and incubation centres dedicated to experimenting with plant-based foods is impeding the industry's capacity to innovate. Additionally, Indian products must conform to global standards, yet Indian manufacturers lack adequate knowledge of the functional and nutritional characteristics of plant-based products employed in established markets. Therefore,

a Centre of Excellence that channels the expertise of academia and food experts to the plant-based foods industry may be required to accelerate research and development in this area.

b. Plant-based Common Services Centers (CSC)

Establishment of the plant-based "Common Services Centres" by collaborative efforts of various Ministries like Agriculture, Food Processing and institutions could be a solution. Through a joint infrastructural development effort by leveraging schemes of the different Ministries focused on plant-based foods, the plant-based CSC can address the issues faced by the industry i.e., demand-supply gap, capital-intensive manufacturing facilities with high-end equipment, and lack of dedicated value-chain for the sector.

c. Assistance in access to markets and organizing plant-based food mela/ exhibitions

Plant-based food mela/exhibitions can go a long way in developing and promoting plant-based foods. Some of the potential benefits may include:

- ▶ Facilitation of meetings and industry connects
- ▶ Help improve networking and learning about client needs and preferences.

- ▶ Reinforcing of relationships with existing customers to introduce product and service offerings.
- ▶ Creating brand awareness, recognition, proximity, and relevancy and build a positive brand image
- ▶ Comprehending the latest developments and competitive landscape of the plant-based foods sector
- ▶ Assess the existing marketing combination for product promotion and develop a strategy for the marketing combination for product promotion in an effective and efficient manner.

4.1. Success factors for launching plant-based products

Quality ingredients are essential to ensure the success of plant-based products. Improved production methods, combined with the availability of top-notch ingredients, can result in appealing and nutritious plant-based foods that provide consumers with the desired experience.

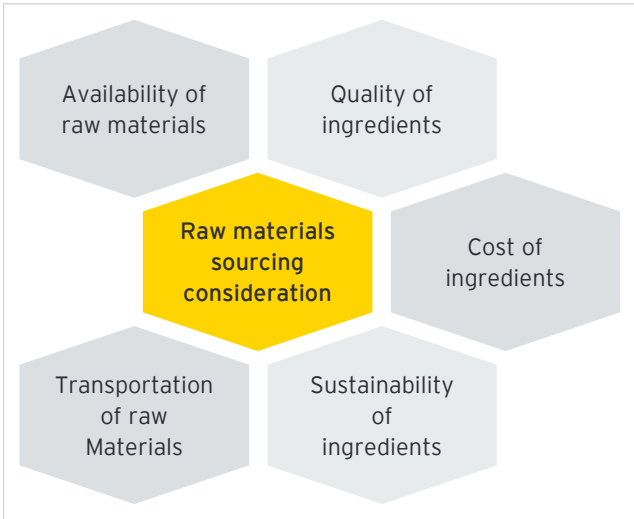
When launching plant-based products, branding and packaging are also key factors in achieving success. Packaging should differentiate the product from others that are available in the market and should have a strong brand identity that communicates the product's values and benefits. Additionally, plant-based food companies must carefully select logistics and distribution channels to ensure that the product reaches the target customer in a timely manner and at a fair and competitive price.

Success factors for launching plant-based products

- ▶ Availability of quality ingredients
- ▶ Product availability and accessibility
- ▶ Fair and competitive pricing
- ▶ Product quality, taste, nutrition and variety
- ▶ Packaging and branding
- ▶ Customer preferred innovative plant-based product mix
- ▶ Wider distribution channels
- ▶ Appropriate marketing and promotion mix to reach right target consumer
- ▶ Product feedback and improvement

4.2 Operational consideration for sourcing of raw materials

To produce plant-based food, it is essential to have a reliable and sustainable source of quality raw materials free from contamination, at a fair and competitive cost. Companies can adopt various sourcing strategies, such as working with local farmers, establishing relationships with reliable suppliers, or procuring from farmer clusters or common interest groups. Efficient and safe transportation facilities are also necessary for sourcing ingredients for production, ensuring timely delivery of the raw materials.



4.3 Operational considerations for sourcing and production of plant-based food

The sourcing and production of plant-based foods heavily rely on the availability of high-quality and sustainable ingredients. To ensure a consistent supply of raw materials, contract negotiation with farmers, farmer groups, and suppliers is crucial. It is also

essential for plant-based food production processes to comply with food safety regulations. Investing in equipment and infrastructure can optimize the production process for plant-based food manufacturing companies.







5

Government interventions for supporting plant-based foods sector

The Government can play a crucial role in establishing and promoting the plant-based food industry in India and globally by providing fiscal, monetary, and other incentives. The current categorization of plant-based food products is complicated for start-ups, which puts the sector at a disadvantage. To foster the growth of the plant-based sector across the value chain, the government can establish a national-level nodal institute with regional presence to drive policy change and develop a sustainable industry ecosystem.

The successful establishment of the plant-based food industry is expected to create new avenues for employment in India, infuse innovation, R&D and new skill development, and address unemployment issues. The government can leverage various schemes such as Production Linked Incentive Scheme for Food Processing Industry (PLISFPI) Scheme, Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) Scheme, Micro and Small Enterprises Cluster Development Programme, Entrepreneurship and Skill Development Programme, and Market Access Initiative Scheme to encourage innovation and growth in the sector.

The plant-based food industry has the potential to become a substantial economic driver, employer, and provider of nutrition on a national level, becoming a potential regional and global exporter. As the demand for plant-based products continues to grow, more companies are entering the market, which can lead to the creation of new jobs in areas such as manufacturing, distribution, and retail. Additionally, the industry can also provide opportunities for small and medium-sized businesses, which can help to stimulate local economies.

Collaboration between various governments and departments can bring about numerous potential outcomes that can help harness the potential of the plant-based foods sector in a sustainable, responsible, inclusive, and equitable manner. Some of these outcomes include:

- ▶ Focusing on local processing and export of value-added plant proteins to enhance and intensify attention to it.
- ▶ Improving production and productivity of raw materials by expanding, intensifying, diversifying and making productive use of available resources.
- ▶ Maintaining a delicate balance between production and productivity activities, including technology infusion, post-harvest infrastructure, value chain reinforcement, robust management and a regulatory framework.
- ▶ Reinforcing post-harvest value chain management and improve quality.
- ▶ Enhancing contribution to the export of raw materials and plant-based food products.
- ▶ Establishing a robust management and regulatory framework.
- ▶ Forming alliances with farmers' federations and cooperatives to promote collaboration.
- ▶ Creating a conducive environment for private sector participation and investment, development of entrepreneurship, business models, promotion of ease of doing business, innovations, and innovative project activities including start-ups, incubators, etc., in the plant-based foods sector.

India's potential to become a global leader in plant-based foods can be achieved by unlocking the potential for production, processing, marketing, and export of plant-based foods, with the help of existing infrastructure, regulations, policies, standards, and procedures. Collaboration between various ministries and departments under the Government of India is required to strike a suitable balance between production and marketing activities. Along with this, adequate technology infusion, R&D infrastructure, strengthened value chains, robust regulatory and management framework, appropriate system of taxation, government, and private investment are also essential.

Some of the potential activities, expected outcomes and potential synergies/ convergence between ministries/ Departments are outlined below:

Concerned Area of PBF	Actions intended to accomplish	Rationale	Expected Impact	Suggested Action for fostering PBF	Concerned Ministry/ Departments
 Demand Generation	Plan various events to promote and establish the market for PBF	India has the potential to meet the global demand for plant protein	Market entry and commercialization opportunities, production and selection of new product ideas, market innovation and product development, and increased exports.	Organizing plant-based foods summit, delegation to various international events like the Gulf Food Festival	Ministry of Commerce and Industry APEDA
	Increasing consumer knowledge and familiarity	People are aware of veganism, but they lack the clarity that plant-based foods cater not only to vegans but also to other dietary preferences	National awareness of the sustainable global food system supply	Planning and organizing various public campaigns with appropriate promotional and marketing mix	Ministry of Food Processing Industries Ministry of Environment Ministry of Health and Family Welfare FSSAI
 Food safety and labeling	Creating change and acceptability for nomenclature	Appropriate amendment in FSSAI regulations for food safety and practices	Lower market access cost for start-ups and entrepreneurs and assistance in brand building and brand recognition	Revision of packaging and labeling guidelines	FSSAI / Department of Food
	Training and handholding on food safety, handling, and regulatory requirements to start-ups/stakeholder	Quality excellence through capacity building on system standards, implementation practices, and food safety and quality tools, techniques, and technologies	Adherence to quality standards	Training to SMEs with brief recorded module videos	FSSAI Ministry of MSME
 Investment	Investment in start-ups through university incubators	Open-access research to accelerate progress and ensure most universities are at the forefront of	Promoting student entrepreneurship	Establishment of region-specific incubation centers focused on plant-based foods	Ministry of HRD Atal Innovation Mission Vice Chancellor of Central and State universities

Concerned Area of PBF	Actions intended to accomplish	Rationale	Expected Impact	Suggested Action for fostering PBF	Concerned Ministry/ Departments
		plant protein research			
	Research Grant Program	Opportunity for researchers to work across the globe to gain knowledge	Promoting novel research and product development	Collaboration with world-class universities and grant allocation for Indian scientists working in this field	Ministry of External Affairs Ministry of Education
 Incentives	Optimal use of fertilizers and chemicals	To compete in the global market, quality raw materials are required for raw materials and finished product export	Increase exports and gain premium	Incentives to the farmer for following responsible production based on good agriculture practices with quality raw materials which are permissible	Ministry of Agriculture and Farmers Welfare Ministry of Chemical and Fertilizers
	Reforms of subsidy programs that would bridge the large competitive gap between commodities and specialty crops	Many specialty crops are used for producing plant-based foods such as chickpeas, mung dal, other pulses, millets, coconut, hemp, oats, etc.	Support farmers in gaining better prices for producing specialty crops used in food production	Incentives to farmers to produce specialty crops such as pulses, millets, etc., for food	Ministry of Agriculture and Farmers Welfare
	Availing appropriate technology for producing plant proteins and plant-based foods	There is a monopoly in the market as players with appropriate technology are low	Increase in production and supply of low-cost plant-protein and plant-based products	Schemes to facilitate setting up clusters focused on plant protein or plant-based food	Ministry of Food Processing Industries, Ministry of Agriculture
 Partnerships	Partnerships with HoReCa and retailer forums	There is an inconsistent retail presence as listing fees and commissions are very high for start-ups. Making products available	Reducing entry cost for SMEs	Guidelines for retailers and HoReCa distributors for the protection of SMEs	Department of Food FDA FSSAI MoMSME

Concerned Area of PBF	Actions intended to accomplish	Rationale	Expected Impact	Suggested Action for fostering PBF	Concerned Ministry/ Departments
		via the HoReCa segment can help shift consumer behavior and support the acceptance of plant-based foods.			
	Post Graduate specialized degree and online executive certificate courses on plant-based foods	To fulfill the increase in demand for workforce specialized in this sector	Boost the number of skilled professionals in the workforce and widen their knowledge horizon	Accredited courses in various universities and colleges all over India. Also, running online courses on platforms such as IGMPI	Ministry of Education Vice Chancellor of Central and State universities
 Research and Development	Plant-based food Equipment Research Centre	The machinery for PBF is imported and is cost-heavy. This facility will boost the Indian economy and help the Make in India initiative to succeed in this segment.	World-Class Food Technology equipment and innovation, R& D infrastructure for boosting plant-based foods sector and for developing sustainable plant-based food supply chain which meets consumers' preference	Make in-India machinery and equipment. Investments in plant protein extraction technology, equipment, research, Product innovation, product diversification	Ministry of Heavy Industries & Public Enterprises Ministry of Agro & Rural Industries Ministry of Micro, Small & Medium Enterprises
	Centre of Excellence for Food Innovation	Sensory quality, especially taste, texture, and other sensory traits of plant-based meat need adaptation to the local palate	Identify the research gap and maintain the research reservoir through seamless, real-time collaboration across various universities Establishment of Training infrastructure for cost-effective courses on plant-based food products	Investment in public-private R&D facility	Ministry of Food Processing Industries (MoFPI)



Conclusion

The trend towards plant-based diets is growing globally, with consumers choosing more plant-based options. This trend has been fuelled by a growing body of scientific research that highlights the benefits of plant-based diets, including reduced risk of chronic diseases and better health benefits. As a result, the plant-based foods sector is experiencing growth, and businesses are looking for ways to capitalize on this trend.

In India, plant-based foods have been a part of the traditional diet for centuries, with a rich variety of plant-based cuisines that offer diverse flavors, textures, and nutritional benefits. This presents a significant opportunity for businesses to cater to the growing demand for plant-based foods while leveraging India's rich culinary heritage.

However, the plant-based foods sector in India also faces several challenges. One of the most significant challenges is sourcing high-quality ingredients at an affordable cost. While India has a rich agricultural sector, the availability of plant-based protein sources like soy, peas, and nuts is limited. This makes it challenging for businesses to produce high-quality plant-based products at scale. The plant-based foods sector in India is in a nascent stage, and businesses may not have the resources or expertise to scale production quickly. This can lead to issues with quality control, distribution, and supply chain management.

Consumer perception is also a challenge for the plant-based foods sector in India. While plant-based foods have been a part of the traditional diet, they are often associated with being low in protein or lacking in taste.

This perception may be a significant barrier to adoption, particularly for consumers who are used to meat-based diets.

To overcome these challenges, businesses would need to adopt innovative strategies such as leveraging technology to increase production efficiency and reduce costs, Vertical farming, to grow crops in a controlled environment, reducing the risk of crop failure due to weather or pests, exploring alternate protein sources etc.

Targeted marketing campaigns may also help address consumer perception issues. By highlighting the nutritional benefits and variety of flavours available in plant-based foods, businesses may help attract consumers towards plant-based diets.

Government interventions can also play a critical role in supporting the plant-based foods sector. Subsidies, incentives, and policy changes can help make plant-based ingredients more affordable and accessible. For example, the Indian government recently launched the PM-FME (Pradhan Mantri Formalization of Micro Food Processing Enterprises) scheme, which aims to support small food processing businesses by providing financial assistance and technical support.

In conclusion, the global trend towards plant-based diets presents opportunities for businesses to cater to the growing demand for plant-based foods. In India, businesses can leverage the country's rich culinary heritage to create authentic and innovative plant-based products that appeal to both local and international consumers.

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