Plant-based food
On a strong growth footing

September 2023
Business contacts

Abhik Pal
Global Head – ESG & Research Practice
CRISIL GR&RS
abhik.pal@crisil.com

Analytical contacts

Pritam Bakre
Lead Analyst
CRISIL GR&RS
pritam.bakre@crisil.com
Contents

Executive summary .................................................................................................................. 4
Shift in consumer fundamentals ............................................................................................... 6
Growing awareness of environment and animal welfare .......................................................... 9
Governments emphasising plant-based food ............................................................................ 10
Plant-based food making global inroads .................................................................................. 12
Inorganic growth and strategic partnerships make headway .................................................... 15
Potential roadblocks .............................................................................................................. 17
Summing-up ............................................................................................................................. 19
Appendix .................................................................................................................................. 20
Executive summary

The global plant-based milk and meat market, estimated at $27.8 billion and $5.9 billion in 2022, respectively, presents an attractive investment opportunity. Over the next decade, this nascent market is expected to more than double in size. Offering an effective substitute for traditional meat and dairy products, plant-based food holds the potential to become a dietary staple and is on a positive growth trajectory, similar to electric vehicles and fintech.

At the core of this shift are three key drivers:

- **Consumer-driven factors such as growing trend of vegan and flexitarian diet and increase in chronic lifestyle disorders:** With consumers becoming increasingly health conscious, many are changing their dietary pattern. These consumers are also looking for variety and flexibility in their diets, fuelling the need to incorporate more products

- **Rising awareness about animal cruelty and impact of factory farming on climate change:** Unethical farming practices, water pollution, greenhouse gas (GHG) emissions, and increasing risk of zoonotic diseases are driving consumers towards plant-based alternatives

- **Evolving competitive landscape and governments' influence on markets:** In a bid to stay competitive, many restaurants and large fast-food chains are adding plant-based products to their menu. Simultaneously, governments worldwide are aligning policies with sustainability goals, incentivising plant-based products through regulations, incentives and tax benefits

While this thriving sector has its own hurdles – be it sensory experience (i.e., taste/texture/appearance), cost pressures, or competition-led discounting – the medium-term outlook remains positive.

**Plant-based milk and meat segments to see robust growth in coming years, outperform peer/parent industries in the consumer food space.**

- The plant-based food industry is primed for significant growth, with a projected compound annual growth rate (CAGR) exceeding 10% from 2022 to 2029. According to Fortune Business Insights and Bloomberg, plant-based milk is set to clock 10.4% CAGR from 2021 to 2031, while plant-based meat will expand at 10.3% CAGR up to 2029

- The parallel success of the global sugar-free food and beverages market, exhibiting an impressive CAGR of 6.1% from 2017 to 2022 and projected to maintain an estimated CAGR of 9.5% from 2022 to 2027, supports out outlook

**Strategic partnerships and alliances paved the way for sustainable innovation; growing appetite for climate-friendly investments will ensure steady capital flows in the coming years.**

- The industry's resilience and promise have captured the attention of traditional industry giants, as indicated by the sustained merger and acquisition (M&A) activity. Further, endorsements by restaurants and large food chains have encouraged consumers to try new plant-based foods – contributing to the demand growth

- Venture capital funding and private investments have helped many start-ups grow and expand quickly

In a nutshell, the plant-based food industry represents a harmonious blend of evolving consumer preferences, heightened environmental consciousness, and impressive market growth. Investors seeking to cash in on changing consumption trends and sustainability practices will find this industry replete with opportunities, poised to deliver substantial returns on investment.
The top three factors driving the plant-based food segment are changing food and lifestyle choices, rising awareness on animal cruelty and climate change, and government push for plant-based milk and meat options.
Shift in consumer fundamentals

Sharper focus on a healthier lifestyle is driving end-consumers to alternatives such as plant-based food.

Substitutes gaining share of plate

With increasing incidence of lifestyle diseases and emphasis on consumption of healthy foods, plant-based foods are gaining traction as a suitable replacement for meat as a source of protein. While meat is indeed an important source of protein, minerals, and B-complex vitamins, overconsumption of red and processed meat has been linked to cardiovascular diseases and some cancers.

Figure 1: Nutritional composition of US beef vs ‘Beyond Burger’ vs ‘Impossible Burger’ (100 g)

<table>
<thead>
<tr>
<th></th>
<th>US beef burger</th>
<th>Beyond Burger</th>
<th>Impossible Burger</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calories (kcal)</td>
<td>254</td>
<td>252</td>
<td>212</td>
</tr>
<tr>
<td>Protein (g)</td>
<td>17.2</td>
<td>17.0</td>
<td>17.0</td>
</tr>
<tr>
<td>Total fat (g)</td>
<td>20.0</td>
<td>19.0</td>
<td>12.4</td>
</tr>
<tr>
<td>Saturated fat (g)</td>
<td>7.58</td>
<td>5.6</td>
<td>7.0</td>
</tr>
<tr>
<td>Total carbohydrate (g)</td>
<td>0</td>
<td>3.5</td>
<td>8.0</td>
</tr>
<tr>
<td>Fibre (g)</td>
<td>0</td>
<td>1.3</td>
<td>2.7</td>
</tr>
<tr>
<td>Iron (mg)</td>
<td>1.94</td>
<td>4.0</td>
<td>3.7</td>
</tr>
<tr>
<td>Cholesterol (mg)</td>
<td>71</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Sodium (mg)</td>
<td>66</td>
<td>345</td>
<td>327</td>
</tr>
<tr>
<td>Sugar (g)</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

*Note: Green indicates +ve trend, and red, -ve trend
Source: OECD*

Proteins and vitamins in plant-based burgers are comparable to beef burgers, while iron and calcium content in the former is higher than that in the latter. Further, plant-based burgers offer dietary fibre that is associated with lower chances of cancer, stroke and coronary heart diseases. They are also cholesterol-free, unlike meat. Besides, plant-based foods are not prone to food-borne diseases, infections, and antimicrobial resistance. Moreover, the use of antibiotics in crop production is much lesser than in meat production. In the United States (US), usage of antibiotics in plant production amounts to less than 1% of that in meat production.

Lactose intolerance

This is the inability to digest lactose, partially or fully, present in milk/milk products, and is commonly observed among the Asian, Middle Eastern, and African populace. According to Dairy Australia (April 2021), 67% of the population in Asia have lactose intolerance. Alternative dairy products, with low fat, low calorie and low cholesterol, can address this issue.
Underpenetrated category

The plant-based milk market stood at $24.8 billion in 2021 and accounted for 4.6% of the global dairy market. It is expected to constitute 10% of the global dairy market by 2031, and reach $66.8 billion, increasing at 10.4% CAGR between 2021 and 2031. Though the plant-based meat market is still in its infancy (valued at $5.6 billion or only 0.4% of the global meat market in 2021), it is estimated to log a CAGR of 10.3% between 2021 and 2029 to reach $12.3 billion by 2029 (source: Fortune Business Insights and Bloomberg).

Source: Ourworldindata.org
Global Research & Risk Solutions

Source: Ourworldindata.org

Cropland
Pasture

Current global diet

- 704 Mha Human food
- 538 Mha Animal feed
- 2.89 bn ha

Total: 4.13 bn ha
Cropland: 1.24 bn ha
Pasture: 2.89 bn ha

No beef or mutton (beef from dairy cows still included)

- 1.17 bn ha
- 1.04 bn ha

Total: 2.21 bn ha
Cropland: 1.17 bn ha
Pasture: 1.04 bn ha

No beef, mutton or dairy

- 1.1 bn ha

No red meat, dairy or poultry (eggs and fish only)

- 1.01 bn ha

Vegan

- 1 bn ha

57% is used to produce direct human food
43% is used to produce crops fed to animals

If everyone ate a vegan diet we would reduce the amount of land we use for agriculture by 75%.
This is an area the size of North America, plus Brazil.

43% is used to produce crops fed to animals
57% is used to produce direct human food

Shifting to a plant-based diet reduces the amount of cropland we need we can divert land used for animal feed to produce more food for direct consumption.
Growing awareness of environment and animal welfare

Meat producers often resort to unethical practices to maximise output. At the same time, inappropriate factory farming practices can have dire effects on human health and the environment in the long run.

Consumption of plant-based food promotes animal welfare

Annually, over 9.5 billion chickens, pigs, turkeys and cows are raised in factory farms in the US. They are bred to produce meat, milk or eggs at unnatural rates, which can affect their health. Moreover, these animals are raised in congested spaces, which restricts their movement andnatural behaviour of nesting and foraging. Lack of sufficient space often causes injuries arising from frustration. Measures taken to minimise these injuries are also often harsh, including clipping teeth, trimming beaks and docking tails. Often, these animals are not handled properly by workers, who are under pressure to meet production targets. Moreover, the practice of selective breeding and providing concentrated feed, followed by some factory farms to accelerate growth, can lead to weakened or broken bones, infections, organ failure and disabilities in the animals.

Factory farming practices conflict with environmental sustainability measures

- **Water pollution:** Large quantities of water are required for cleaning animal waste. This polluted water is stored in pits or open ponds, which are prone to leaks and lead to surface and groundwater contamination. In fact, chicken waste, when dissolved in water, releases ammonia, which is toxic to fish. Some farmers also dump waste on neighbouring lands, which can pollute local water supplies. Another concern is the massive consumption of water. Factory farming accounts for 55% of total US water consumption, markedly higher than household water consumption (5% of total). This is in stark contrast with the global scenario, where factory farming consumes 16% of freshwater.

- **GHG emissions:** Factory farming also accounts for 15.4% of global GHG emissions, which is equivalent to emissions by the global transportation sector. This is mainly owing to deforestation, use of chemical fertilisers on crops that are consumed by animals, and product shipments. In the US alone, 260 million acres of forest land has been cleared to grow soy, corn and grains for feeding livestock. This is inefficient as meat and dairy products only provide 36% of the calorie content in food in the US. What’s more, animals consume 33% of the world’s grains and ‘occupy’ 33% of ice-free land. Instead, if people directly consume plants, deforestation can be reduced significantly.

And that is not all. Animal agriculture accounts for nearly 50% of global methane emissions. Methane is released from cows’ digestive processes and manure. In the US, factory farming contributes to 65% of nitrous oxide emissions. Factory farms also emit carbon from fuel used for cooling, heating, ventilation, operating machinery and other processes.

- **Rise of zoonotic diseases:** Use of antibiotics leads to unnatural growth in animals and increases the spread of antibiotic-resistant bacteria. According to the Centers for Disease Control and Prevention, 75% of new emerging infectious diseases in people come from animals. This includes diseases from bacteria, viruses, fungi and parasites. On the other hand, vegan food lowers cholesterol and blood pressure, and reduces the risk of certain cancers, Type 2 diabetes and heart disease.

The global population is estimated to reach 9.1 billion by 2050 (United Nations Environment Programme). To feed this rising population, food production needs to increase 70% compared with 2009. According to the International Resource Panel, a platform established by the United Nations Environment Programme, it may not be sustainable to feed the global population with animal products, given the challenges discussed earlier. Hence, shift to a vegan diet is inevitable.
Governments emphasising plant-based food

Governments, mainly in advanced economies, are taking several measures – including initiatives in schools/hospitals, and making plant-based food a part of climate law – to boost vegan food consumption.

Europe seeks to inculcate a vegan culture: In accordance with the ‘farm-to-fork’ strategy, the European Alliance for Plant-based Foods has stressed on improving affordability of plant-based foods. It has recommended that these foods must form an integral component of the European Union (EU) school scheme and sustainability criteria for food procurement (e.g., setting thresholds for minimum share of plant-based offerings in hospitals). The EU has also adopted an amendment that calls for 0% value-added tax on foods benefitting human health and the environment, and a higher tax rate on foods that have an adverse impact on the latter. However, this is yet to be implemented.

Taiwan takes a concrete stand: In early 2023, the Taiwan Council of Agriculture passed a climate bill mandating public departments to encourage consumption of low-carbon diets that include plant-based and locally sourced foods. This makes Taiwan one of the few countries to reference plant-based foods in their climate laws.

China’s thrust at a nascent stage, but could grow: China consumes 28% of the world’s meat and 50% of pork. In January 2022, China’s Ministry of Agriculture and Rural Affairs released a five-year agricultural plan that talks of plant-based eggs. Prior to that, in June 2021, China announced a three-year government-funded project, ‘High-efficiency biological manufacturing technology of artificial meat’. That said, Chinese government funding for alternative proteins is still a miniscule component of its consumption.

US has taken some steps, but has a long way to go: Schools in New York, California and Illinois encourage intake of plant-based foods. In July 2022, California became the first US state to unveil $700 million investment in the promotion of plant-based school meals. That apart, though the US has announced plans to reduce the environmental impact of its food system, the Dietary Guidelines for Americans, 2020-2025, makes no mention of plant-based meat, with only a brief discussion on plant-based milk.
Plant-based food market is set on a growth trajectory and will likely outpace peer sub-segments, including nutritional food and beverages, dietary supplements and breakfast cereals, among others. Industry consolidation and growing interest from private investors will provide the necessary capital for expansion, also aiding new product development.
Plant-based food making global inroads

Across markets, plant-based food is expected to outperform traditional counterparts, as well as other food and beverages.

The Asia-Pacific (APAC) is the largest market for plant-based milk, accounting for ~42% of the global alternative dairy market. North America and APAC are expected to clock the fastest growth, at a 15.5% and 11.3% CAGR, respectively, between 2023 and 2028, backed by lactose intolerance, sensitivity to conventional dairy products, allergies, and rising health consciousness among people. Asia’s agricultural production base is leading to an abundance of raw materials for creating plant-based products.

North America is the largest market for plant-based meat, accounting for 29% of the global sales in 2021, followed by Europe (~26%), APAC (~23%), Latin America (~11%), and the Middle East and Africa (MEA; 11%). The plant-based meat market is projected to clock a CAGR of high single to low double digits between 2023 and 2028, with APAC and South America expected to outperform other regions. This can be ascribed to Chinese government’s thrust on reducing meat consumption following the new dietary guidelines announced in 2016, search for healthier protein options, and longer shelf life of soy.

### Plant-based milk (2022)

<table>
<thead>
<tr>
<th>Region</th>
<th>Market Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>APAC</td>
<td>42%</td>
</tr>
<tr>
<td>Europe</td>
<td>11%</td>
</tr>
<tr>
<td>Latin America</td>
<td>13%</td>
</tr>
<tr>
<td>North America</td>
<td>26%</td>
</tr>
<tr>
<td>MEA</td>
<td>9%</td>
</tr>
</tbody>
</table>

### Plant-based meat (2021)

<table>
<thead>
<tr>
<th>Region</th>
<th>Market Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>North America</td>
<td>29%</td>
</tr>
<tr>
<td>Europe</td>
<td>26%</td>
</tr>
<tr>
<td>APAC</td>
<td>23%</td>
</tr>
<tr>
<td>Latin America</td>
<td>11%</td>
</tr>
<tr>
<td>MEA</td>
<td>11%</td>
</tr>
</tbody>
</table>

*Europe data is an approximation; round-off error (no tally to 100%)*  
MEA considered as a balancing figure  
*Source: MDF*  
*Source: Coherent Market Insights*

### APAC, North America dairy alternatives markets highly fragmented, comprising local and global players

<table>
<thead>
<tr>
<th>Key players in APAC</th>
<th>Key players in North America</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitasoy</td>
<td>Blue Diamond Growers</td>
</tr>
<tr>
<td>Blue Diamond Growers</td>
<td>Danone</td>
</tr>
<tr>
<td>Danone</td>
<td>Sunopta Inc.</td>
</tr>
<tr>
<td>Sanitarium Health and Wellbeing Company</td>
<td>Califia Farms LLC</td>
</tr>
<tr>
<td>Kikkoman Corporation</td>
<td>Oatly Group AB</td>
</tr>
</tbody>
</table>

*The North American meat substitutes market is modestly consolidated*. The top five players comprise ~47% of the market. Relatively, the European meat substitutes market is more fragmented, with the top five players comprising only ~26%.
Top five players in North America (47% market share)  
- Kellogg’s  
- Beyond Meat  
- Impossible Foods  
- Conagra Brands  
- Amy’s Kitchen

Top five players in Europe (26% market share)  
- Beyond Meat  
- Conagra Brands  
- Amy’s Kitchen  
- House Foods Group  
- International Flavours and Fragrances

Except South America, plant-based milk is expected to handily outperform the traditional dairy market by 300-1,100 basis points (bps). Globally, plant-based meat is expected to outperform traditional meat by 200-700 bps, with the highest outperformance in North America and MEA, and the lowest in APAC.

Plant-based foods’ growth to likely outpace that of peer/parent industries in the consumer food space

* Sugar-free confectionary: CAGR is for 2023-2029E  
Source: Maximize Market Research, Data Bridge Market Research, BlueWeave Consulting
Plant-based foods make up a **subset of the global frozen foods and packaged foods markets**. The above chart suggests that growth in plant-based foods is 600 bps higher than in the global packaged foods market, which is projected to clock a 7-year CAGR of merely 4.5% to reach $4,470 billion by 2029 (*Maximize Market Research*). Over the same period, the global frozen foods market is projected to grow at a similar pace (CAGR of 4.7%) to reach $352.1 billion, clearly underperforming plant-based foods’ growth (*Data Bridge Market Research*).

**Glimpse of a parallel success story that instils confidence in this segment**: The global sugar-free food and beverages market was valued at $51.9 billion in 2017 and grew at a CAGR of 6.1% up to 2022. In 2022, it reached a value of $69.6 billion. From 2022, it is estimated to log a CAGR of 9.5% to reach a value of $109.8 billion by 2027, backed by the rising instances of diabetes, obesity, and being overweight, which are driving consumer demand for sugar-free food. Additionally, sugar-free diets have been shown to reduce the risk of inflammatory digestive conditions such as irritable bowel disease and Crohn's disease. **We believe that an annualised growth rate of over 10% in the medium term for plant-based foods is reasonable, considering growth in the parallel industry focused on health products.**
Inorganic growth and strategic partnerships make headway

Plant-based food, in general, faces strong competition from traditional meats, mainly owing to its higher pricing. However, competition within the space is intensifying as well, as the push towards sustainability has encouraged many start-ups and traditional food companies to compete with incumbent players such as Beyond Meat and Impossible Foods. In general, larger players are acquiring companies and forming partnerships to stay competitive.

Key M&As in the plant-based food space

<table>
<thead>
<tr>
<th>Year</th>
<th>Buyer</th>
<th>Target</th>
<th>Area</th>
<th>Deal size</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2023</td>
<td>Next Gen Foods</td>
<td>Mwah</td>
<td>Plant-based milk</td>
<td>Undisclosed</td>
<td>Product diversification in plant-based gelato; acquirer seeks to launch Mwah products in the US, the UK, and Germany</td>
</tr>
<tr>
<td>2023</td>
<td>VFC</td>
<td>Meatless Farm</td>
<td>Plant-based meat</td>
<td>Undisclosed</td>
<td>Product diversification</td>
</tr>
<tr>
<td>2022</td>
<td>PlantPlus Foods</td>
<td>Sol Cuisine</td>
<td>Plant-based meat</td>
<td>$102 million</td>
<td>Boosts presence in North America; Sol Cuisine could leverage PlantPlus Foods’ research and development (R&amp;D) and manufacturing expertise</td>
</tr>
<tr>
<td>2021</td>
<td>JBS</td>
<td>Vivera</td>
<td>Plant-based meat</td>
<td>$409 million</td>
<td>Brazilian meat processor JBS acquired Dutch company Vivera, including three factories and an R&amp;D centre, to boost its plant-based protein offerings. Vivera is Europe’s third-largest plant-based protein maker, with a ‘relevant market share’ in the Netherlands, the UK, and Germany. It sells in 25 countries through Tesco and Ocado</td>
</tr>
<tr>
<td>2019</td>
<td>Tyson Foods</td>
<td>New Wave Foods</td>
<td>Plant-based shrimp</td>
<td>Undisclosed (minority &lt;20% stake)</td>
<td>Tyson Foods had sold a stake in Beyond Meat before the latter’s initial public offering. Subsequently, it acquired a &lt;20% stake in New Wave Foods. The start-up makes plant-based shrimp from soy protein, seaweed and natural flavours</td>
</tr>
<tr>
<td>2019</td>
<td>Inner Mongolia Yili Industrial Group</td>
<td>Westland Milk Foods</td>
<td>Plant-based milk</td>
<td>$404 million</td>
<td>The acquisition enabled the China-based acquiror’s expansion into New Zealand. According to its CEO, “New Zealand’s strong dairying tradition, high-quality raw milk, and well-regulated industry are key catalysts for acquisition”</td>
</tr>
<tr>
<td>2017</td>
<td>Nestle</td>
<td>Sweet Earth</td>
<td>Plant-based meat</td>
<td>Undisclosed</td>
<td>The acquisition enabled entry into the plant-based food market. Sweet Earth offered diversified meals, sold in over 10,000 stores in the US</td>
</tr>
<tr>
<td>2017</td>
<td>Campbell Soup</td>
<td>Pacific Foods</td>
<td>Plant-based milk</td>
<td>$700 million</td>
<td>The acquisition facilitated Campbell Soup’s foray into plant-based broths, soups, chilis and milks</td>
</tr>
<tr>
<td>2017</td>
<td>Danone</td>
<td>WhiteWave Foods</td>
<td>Plant-based milk</td>
<td>$12.5 billion</td>
<td>The acquisition boosted Danone’s presence in the US plant-based milk market. WhiteWave’s European brand Alpro will be part of a newly created plant-based business unit within Danone</td>
</tr>
<tr>
<td>2015</td>
<td>Monde Nissin</td>
<td>Quorn</td>
<td>Plant-based meat</td>
<td>$831 million</td>
<td>Quorn is a UK-based meat substitutes company; the acquisition facilitates Monde Nissin’s global ambitions to expand into sustainable food categories</td>
</tr>
</tbody>
</table>
Tyson Foods launched its Raised and Rooted brand in the US in 2019 to tap the alternative proteins segment. Encouraged by its success in the US, it also launched the brand in Europe in 2022. As per the company, its plant-based nuggets and tenders are sold in 10,000 stores and online.

**Strategic partnerships:** Companies are tying up with restaurants and retail chains for vegan offerings.

<table>
<thead>
<tr>
<th>Year</th>
<th>Partnership</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>Impossible Foods and Burger King</td>
<td>Burger King began selling the Impossible Whopper (plant-based burger) from Impossible Foods following positive test runs in seven markets</td>
</tr>
<tr>
<td>2021</td>
<td>Impossible Foods and Burger King, and other leading retail chains</td>
<td>Burger King teamed up with Impossible Foods to sell plant-based nuggets. Impossible Foods commenced selling soy-based nuggets in the second half of 2021, at Walmart, Kroger, Albertsons, and other grocery stores</td>
</tr>
<tr>
<td>2022</td>
<td>Quorn and KFC</td>
<td>Quorn tied up with KFC to launch vegan burgers in the UK and is seeking to expand this relationship to bolster its presence in Europe</td>
</tr>
</tbody>
</table>

Overall investments (acquisitions and fund-raising in plant-based meat, egg, and dairy companies) declined in 2022. This could be attributed to the high base in 2020 and 2021. Investor interest and fund-raising activity in plant-based foods shot up in these years as the pandemic accelerated demand for sustainable investments. That said, investment activity in 2022 still exceeded that in 2019 by 43%, underlining growing investor interest.

**Investments* in plant-based food space**

*Note for invested capital

Source: Good Food Institute report 2022

---

Source: Crunchbase
Potential roadblocks

Leading companies in the space are still struggling to grow, facing competition from cultured, or cultivated or lab-grown meat. Different taste remains a key impediment in the adoption of plant-based meat.

Plant-based food is sold at a substantial premium to its traditional counterparts.

<table>
<thead>
<tr>
<th>Product</th>
<th>Price of plant-based variant (x times of animal-based)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plant-based beef</td>
<td>2.00x</td>
</tr>
<tr>
<td>Plant-based chicken</td>
<td>4.00x</td>
</tr>
<tr>
<td>Plant-based milk</td>
<td>1.87x</td>
</tr>
<tr>
<td>Plant-based eggs</td>
<td>2.22x</td>
</tr>
</tbody>
</table>

A February 2022 Credit Suisse survey found that taste was the primary reason plant-based food is shunned in developed nations. The emerging world also cited that taste was an important factor in decision-making, though price also emerged as an equal or a slightly more important reason for people avoiding plant-based food.

Taste versus price survey

Data plotted based on approximate figures, as gauged from the graph
Source: Credit Suisse

Cash burn: Despite higher pricing, leading companies in the plant-based food space are struggling to deliver profitable growth and have announced layoffs/shutdowns, due to elevated competition, in addition to the taste and pricing impediments. The tide may gradually turn as the industry starts to mature. More consolidations are likely as larger firms may remain keen on acquiring innovative, smaller firms that give them a competitive moat. Hence, there may be a scarcity premium for the right assets.
### Profitability ($ million)

**Beyond Meat**
- **Revenue**
  - CY20: 407
  - CY21: 465
  - CY22: 419
- **EBITDA**
  - CY20: -33
  - CY21: -149
  - CY22: -303
- **PAT**
  - CY20: -53
  - CY21: -182
  - CY22: -366

**Oatly**
- **Revenue**
  - CY20: 421
  - CY21: 643
  - CY22: 722
- **EBITDA**
  - CY20: -34
  - CY21: -187
  - CY22: -348
- **PAT**
  - CY20: -60
  - CY21: -212
  - CY22: -393

### Valuation ($ billion)

**Beyond Meat**
- **Market cap**
  - CY20: 7.9
  - CY21: 4.1
  - CY22: 0.8
  - Current*: 0.7

**Oatly**
- **Market cap**
  - CY21: 4.7
  - CY22: 1.0
  - Current*: 0.6

*Current valuation as of September 13, 2023

Source: Bloomberg

**Short-term economic headwinds:** Food inflation has aggravated concerns associated with higher pricing of plant-based food. VC financing for plant-based meat nosedived to $75.2 million during January-March 2023, compared with $703 million during January-March 2022, due to tighter spending on account of elevated inflation and interest rates. That said, US inflation is showing signs of moderation in 2023.

**Biased marketing interests:** Another key challenge is potential gatekeeper bias. About 95% of the members serving on the 2020 Dietary Guidelines Advisory Committee had relationships with major food companies and trade associations, including Cattlemen’s Beef Board, American Egg Board, and National Pork Board. These companies and associations provide research funding, Board seats, honoraria and awards, and consulting jobs. As a result, committee recommendations on dietary guidelines may be subject to partiality.

**Threat from cultured meat:** Plant-based food faces competition from cultured, or cultivated or lab-grown meat grown using animal stem cells. This is real meat, but does not require animal slaughtering. While this industry is still in the nascent stage, it is making strides. Singapore and the US have approved the sale of cultured meat. According to The International Journal of Life Cycle Assessment, cultured meat can lower carbon footprint by 92%, land use by 90%, and water use by 66% vis-à-vis conventional beef production. VC funding for cultured meat space was ~$699 million in 2022, down 25% compared with 2021, but up considerably from $0.25 million in 2015.
Summing-up

Tailwinds for the plant-based food industry include:

- Emphasis on healthier lifestyles
- Animal welfare appeal
- Government push

Plant-based dairy and meat products are underpenetrated; based on their inherent benefits, the sub-sectors are poised to outperform other categories in the food and beverages sector. Therefore, we see these commanding interest from global corporations, as evidenced from the M&As and strategic alliances. The sector remains a favourite for venture capitalists, which can act as a reckoner for private equity investors.

That said, the plant-based food industry faces a unique set of challenges. Investor interest has subsided over the past year and a half, but is still higher than in the pre-Covid era. We have inferred that the dip could be temporary, given the high-inflation environment. Nevertheless, plant-based food is undeniably addressing global concerns over climate sustainability and health. Hence, we believe its long-term outlook remains sanguine.
Appendix

Classification of plant-based food

- Plant-based milk (sources include soy, oat, almond, rice, wheat, cashew, coconut, hazelnut, hemp, macadamia, spelt)
- Plant-based meat (sources include tofu, soy, mushrooms, peas, beans, coconut oil, and wheat gluten)

Europe seeks to inculcate a vegan culture: In December 2021, the Netherlands set aside €25 billion to cull livestock as it dealt with high pollution, given that it has the highest density of livestock in Europe. Denmark’s dietary guidelines published in 2021 recommended lowering weekly meat consumption to 350 g compared with 500 g in the 2013 edition. Further, Germany’s National Nutrition Strategy calls for promoting plant-based diets in government-run hospitals and schools.

Threat from cultured meat

In December 2020, the Singapore Food Agency approved the sale of the world’s first cultivated chicken product, which is now sold in several public food stalls, restaurants, and a butchery. In July 2023, the US Department of Agriculture also approved the production and sale of cultivated chicken by Upside Foods and GOOD Meat. The US, thus, became the second country to approve the sale of cultured meat.

Companies struggling to report profitable growth, have resorted to layoffs

- In October 2022, US-based Beyond Meat announced it was laying-off of 200 employees, or ~19% of its workforce. Only in August, it had laid-off 4%
- In February 2023, US-based Impossible Foods announced it was letting go of 132 employees, or 20% of its workforce, in its third round of layoffs. In October 2022, it had laid off 6%
- In November 2022, Sweden’s Oatly announced it was cutting jobs in corporate roles and European divisions
- In August 2022, Canada’s Maple Leaf Foods announced it was downsizing its Greenleaf Foods division by 25%
- In October 2022, Brazil’s JBS closed Planterra Foods, a plant-based meat unit in the US.

Invested capital

Includes accelerator and incubator funding, angel funding, seed funding, equity and product crowdfunding, early-stage venture capital, late-stage venture capital, private equity growth/expansion, capitalisation, corporate ventures, joint ventures, convertible debt, and general debt completed deals
About CRISIL Limited
CRISIL is a leading, agile and innovative global analytics company driven by its mission of making markets function better.

It is India’s foremost provider of ratings, data, research, analytics and solutions with a strong track record of growth, culture of innovation, and global footprint.

It has delivered independent opinions, actionable insights, and efficient solutions to over 100,000 customers through businesses that operate from India, the US, the UK, Argentina, Poland, China, Hong Kong and Singapore.

It is majority owned by S&P Global Inc, a leading provider of transparent and independent ratings, benchmarks, analytics and data to the capital and commodity markets worldwide.

About Global Research & Risk Solutions
Global Research & Risk Solutions is the world's largest and top-ranked provider of high-end research and analytics services. We are the world's largest provider of equity and fixed income research support to banks, and the foremost provider of end-to-end risk and analytics services to trading and risk management functions at world's leading financial institutions. We provide corporate research and analytics solutions to operations, strategy, and sales and marketing teams of corporations globally. Coalition provides analytics and business intelligence to 14 leading global investment banks. We operate from 8 research centers in Argentina, China, India and Poland, working with clients across time zones and languages. Being part of CRISIL enables us to attract and retain top quality talent. We have over 2,300 employees, 75% of whom hold advanced degrees in finance, accounting and management. We employ the largest number of CFAs and CFA aspirants in India. We have won top honours at the World HR Congress on Talent Management and HR Project for the year 2015. We have also won the NASSCOM Exemplary Talent Practices Award (NExT Practices) for skill development for two years in succession in 2011 and 2012. The award recognizes us as a firm that has the vision to proactively invest in its people and get them future-ready.

We are committed to delivering cutting-edge analysis, opinions, and solutions. This underscores our proposition of being the best people to work with.

CRISIL Privacy Notice
CRISIL respects your privacy. We may use your contact information, such as your name, address, and email id to fulfil your request and service your account and to provide you with additional information from CRISIL. For further information on CRISIL’s privacy policy please visit www.crisil.com.