Alternative Proteins and Asia

Insights for Australian and New Zealand exporters on China, Singapore, South Korea, Japan and Thailand.

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Contents

Introduction

Asia is home to more than 60% of the world's population, a powerhouse of industry, innovation and economic activity. It has a diverse and populous region: 4.3 billion people, 49 countries, 2,300 languages and 11 major religions.

This diversity gives rise to various food cultures, with six major cuisines and local expressions, and a broad range of protein types consumed across the region. Asia has a long history of eating traditional plant proteins such as tofu and tempeh, as well as soy and seitan-based 'mock meats' consumed by vegetarian and Buddhist populations.

Conventional animal meat is ubiquitous across the region and its consumption has increased sharply in Asia in the past 30 years; beef consumption has risen in almost all markets and more than doubled in South Korea and China; poultry consumption has increased in all markets except Thailand; while pork consumption has steadily increased in all markets and continues to dominate the protein market in Asia in both volume produced and consumed. The Food and Agriculture Organization (FAO) predicts that the global demand for meat will increase by 73% by 2050, driven by increasing population size and prosperity particularly in Asia.[1]

The imperative for business and government to diversify protein offerings to sustain growing demand, coupled with increasing awareness and interest in new options among consumers, has seen the recent emergence of alternative protein industries such as plant-based meat and cellular agriculture. These newer protein options aim to satisfy consumers' personal, cultural and economic desires for eating meat, using plants, cell-cultivation or fermentation technologies as an alternative to large-scale livestock farming and fishing.

Asia's market for meat substitutes (mock meat and plant-based meat) is worth USD4.32 billion as of 2023 with the market expected to grow annually by 33.27% (CAGR 2023-2027) and reach USD13.63 billion by 2027.[2] In 2022 alone, USD652 million was invested in alternative proteins companies in the Asia Pacific (APAC) region.[3]

Australia and New Zealand have long traded with Asia, especially in resources and food stuffs, occupying a privileged position as close neighbours and reliable trading partners of safe and quality goods. With an expanding alternative proteins market in Asia, Australia and New Zealand are well-placed to grasp this opportunity and diversify its protein exports into the region.

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Food Frontier is the independent think tank on alternative proteins in Australia and New Zealand.

Funded by grants and donations, our work advances our region's protein supply with new, sustainable, nutritious options that create value for businesses, farmers and consumers.

Since our founding in 2017, Food Frontier's research, reports, events, and direct engagement have been building a collective understanding of the economic, environmental, and public health benefits of alternative proteins in Australia and New Zealand. Our team of agrifood, research, and policy professionals supports leaders across the entire value chain: from producers, manufacturers, scientists and start-ups, to governments, regulators and consumers.

Food Frontier's data, insights and recommendations have reached over 70 million people through the media, 21,000 at events and 17,000 have downloaded our reports.

Food Frontier is located on the traditional lands of the Wurundjeri people of the Kulin Nation. We pay our respects to Elders past and present and recognise and respect their abiding connection to this land, its waterways and community.

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This report equips alternative protein businesses in Australia, New Zealand and other markets with insights to guide their engagement and export strategies for Asia. It also provides investors, policymakers and other industry stakeholders with information to catalyse their engagement in the sector.

In 2022, 11 Asian countries were assessed and ranked for their market suitability based on market size and innovation, market entry and operations, and consumer intelligence. In order of export opportunity: China, Singapore, South Korea, Japan and Thailand were identified as most favourable and are the focus of this report.

The report synthesises primary consumer research from 5,000 consumers across the five markets selected; in-depth industry interviews with 21 manufacturers, retailers and food industry leaders; a deep dive into labelling and regulatory requirements for plant-based meat, cultivated meat, and products of precision and biomass fermentation; and product intelligence from 502 plant-based meat products in-market.

It provides information about the relative pricing of current products, innovation trends and new opportunities, cultural influences, and consumer awareness and attitudes to eating plant-based meats and products of cellular agriculture. The report identifies key barriers, drivers, gaps and opportunities, including the perceived provenance of brand Australia and brand New Zealand in each market.

Food Frontier partnered with Mintel Consulting, a global market intelligence agency, to develop the research informing this report. We wish to thank and acknowledge our research partner and major funder Te Puna Whakaaronui, New Zealand's primary sector think tank, as well as Open Philanthropy for funding the development of this report.

A special thank you to Austrade, particularly their highly experienced, in-market business development teams in China, Singapore, Japan, Thailand and South Korea, for their review and feedback on this report. Also to Rob Hulme, Boralis Group, for his valuable review and input, and to other industry experts who gave their feedback.

Australia and New Zealand have trade and investment agencies to assist manufacturers with market-entry in Asia. Austrade and New Zealand Trade and Enterprise can assist potential exporters with connections in countries of interest and information about how to set their businesses up for export success.

Australian and New Zealand exporters can also utilise the resources of expert import agents to navigate complex local laws and connections to the trade. Specialist organisations also host delegations to the biggest trade shows in the region and provide connections to retail and foodservice channels. Please contact Food Frontier for more information about these connections.

> **Asia will undoubtedly be one of the largest markets for alternative protein in the foreseeable future. With plant-based protein already incorporated into Asian diets for thousands of years, most cultures in Asia have a very different view on these new alternative proteins compared to Western markets.**
>
> **Understanding the main cultural and historical differences in alternative protein adoption is key to capturing this future Asian market.**
>
> **Ratchanida Veeratanabutr**
> Insights Manager Alternative Proteins, Thai Union

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Asian markets: China, Singapore, South Korea, Japan and Thailand

4

Languages translated for in-market surveys and interviews

8

Mintel local analysts consulted

21

Local industry experts consultations

5,000

Asian consumers surveyed

502

Plant-based meat products analysed

Key terms

This report uses various key terms to describe types of alternative proteins. It is important to understand the differences between these terms to understand the research findings.
A full glossary of terms can be found on page 183.

Umbrella terms

Alternative proteins

- **Meat substitutes**
- **Cellular agriculture**

Product terms

Traditional plant protein
Long-standing products such as tofu, tempeh, falafel, and traditional lentil patties, which have existed and been consumed for centuries.

Mock meats
Began to appear as far back as the 10th century in Song Dynasty China for those following a vegetarian diet and are still widely consumed in China and Taiwan today.

Plant-based meats
Pioneering products such as Tofurky and Linda McCartney began appearing in Western markets in the 1970-80s, with a new generation of plant-based meats made using newer food processing techniques emerging in the mid-2010s led by category giants Beyond Meat and Impossible Foods.

Products of precision and biomass fermentation
Biomass fermentation products emerged in the 1980s with products such as Quorn widely available in markets around the world. At the time of publishing, precision fermentation dairy products have been approved and are available for retail sale in Singapore and the USA, have been recently approved for sale in Israel, with more countries expected to approve these products before the middle of the decade.

Cultivated meat
In 2020, Singapore became the first market to approve the commercial sale of cultivated meat followed by the US with the approval of two types of cultivated meat in June 2023. As of June 2023, similar regulatory applications are underway in Qatar and Australia, with approvals expected during 2024. It is anticipated that cultivated meat products will be available via select foodservice venues before moving to retail sales later in the decade as companies scale-up production.

Product novelty

Lower tech, longer history of consumption

Higher tech, less or no history of consumption

Umbrella terms

Alternative proteins: An umbrella term encompassing plant-based meat, cultivated meat and products of precision and biomass fermentation.

Meat substitutes: An umbrella term encompassing both plant-based meat and mock meat. Market size and growth data from Statista used throughout this report applies to meat substitutes.

A note on 'meat substitutes' market data – Several sources of market data are available with varying definitions for meat substitutes and plant-based meats. Despite not directly aligning with Food Frontier's established definitions for 'plant-based meats', the Statista dataset 'meat substitutes market', was used for this report as it was the only source located at the time this research was conducted that provided data on the plant-based meat market size across all Asian markets.

Cellular agriculture: An umbrella term that covers two new food production technologies — cell cultivation, and precision and biomass fermentation.

Product terms

Traditional plant proteins: Long-standing products such as tofu, tempeh, falafel, and traditional lentil patties, which have existed for centuries and do not closely replicate meat.

Mock meat: Long-standing products intended to mimic conventional animal meats that originated in Asia and have been historically consumed by vegetarian and Buddhist populations. Mock meat is typically made of seitan (wheat gluten) or textured soy, with various flavourings added.

Plant-based meats: Newer products intended to taste, look and cook like conventional meat. Early products began appearing in Western markets in the 1970s-80s, with a new generation of plant-based meats emerging in the mid-2010s marketed to flexitarians and those reducing their meat consumption but still seeking the familiar taste and experience of meat. Generally, these products contain plant proteins (most often in the form of protein isolates and concentrates) as a base ingredient.

Products of precision and biomass fermentation: Ingredients produced using new applications of acellular fermentation to make alternative protein food products. Biomass fermentation uses microbes such as bacteria or fungi to reproduce and quickly make large amounts of a protein rich ingredient or 'biomass'. Precision fermentation involves selecting, programming and manufacturing specific microbes to produce compounds such as dairy proteins or fats.

Cultivated meat: Animal meat, including seafood, cultivated directly from cells. A small sample of cells from an animal is fed nutrients including proteins, carbohydrates, and fats, allowing the cells to multiply, the same way they would in an animal. This process takes place in tall tanks called cultivators. Cultivated meat development and pilot production has emerged in the last decade and the product is beginning to reach consumers at select restaurants worldwide, with Singapore leading the way with market approval in 2020.

Key findings—all five markets

- **Foodservice is the best entry point** to grow consumer awareness and trial of plant-based meat products, with quick service restaurants (QSR) accommodating both Western-style and local dishes.

- **Ready meals is a growing segment** that appeals to convenience seekers and demonstrates how these products can be used across familiar dishes and cuisines.

- **Health** is the primary driver for plant-based meat consumption in all markets except Singapore, where **environmental concerns** are the top driver, followed closely by health concerns.

- **Taste, price and perception of being too processed are the most common barriers** to plant-based meat consumption in these markets.

- The dominance of **wheat and soy protein as ingredients does not preclude opportunities for diversification** into new ingredients like protein from mung beans and faba beans and other value-added pulse crops.

- **Australia and New Zealand rate highly** in terms of provenance, and are consistently seen as **suppliers of high-quality, natural, and trustworthy products** in all markets. However, consumers are not always prepared to pay a premium price.

- **Cultivated meat and precision and biomass fermentation products are not well-recognised outside of Singapore**. However, consumers in all markets, except Japan, are generally open to trying foods produced using these technologies.

- Several industry experts highlight the **opportunity for blended products** using plant-based meats blended with animal ingredients to lower costs and retain the taste of products.

- Several industry experts also highlighted the **opportunity for hybrid alternative proteins** – products containing a combination of ingredients produced through cellular agriculture such as fats made with precision fermentation, together with cultivated meat or plant-based proteins to create new hybrid products with an improved flavour profile, or mouthfeel, at potentially lower cost.

Key findings per market

China

China presents the largest meat substitutes market size of USD2.13 billion, with 20% compound annual growth rate (CAGR) predicted to 2027, with global players establishing manufacturing plants, and accelerating funding for start-ups.

Barriers exist due to cultural association of meat consumption with wealth and health, as well as the existing prevalence of traditional plant proteins that are already in diets, such as tofu.

New opportunities exist in the growing 'snacking' category, with adaptation to local cuisines such as mooncake and traditional Chinese dishes.

Research reveals that female, high-income households, and parents are more likely to consume plant-based meat.

Partnership opportunities exist with Chinese businesses, whether for importation and distribution or contract manufacturing for branded, co-branded or white label products, to access markets and reduce costs.

Cultivated meat featured in the government's five-year agricultural plan in January 2022, while Chinese consumers indicate a high level of willingness to consume both cultivated meat (74%) and precision and biomass fermentation (69%).

Singapore

Singapore is considered the centre of innovation in Asia for alternative proteins with a business-friendly environment backed by favourable government policy and regulations to attract investment and innovation.

In relative terms, Singapore has high meat substitute revenue per capita (USD2.34 in 2022).

Singaporeans are multicultural, adventurous consumers who dine out frequently and expect high-quality, good-value food at hawker centres and grocery stores, enjoying both western and Asian cuisines.

Consumers are motivated by environmental concerns due to Singapore's food insecurity, and research reveals that consumers aged 25–34, high-income households, and parents are representative of the groups most likely to consume plant-based meat.

Singapore has the highest awareness of cultivated meat and precision and biomass fermentation and research revealed that 39% of consumers will or are likely to consume cultivated meat.

South Korea

South Korea has high projected meat substitute revenue growth at 20% CAGR to 2027 with high premiumisation.

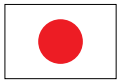
Demand is being driven by the rise in single households seeking the convenience of ready meals and meal kits, and the availability of plant-based meat in local formats.

Health, taste and environmental concerns are driving the trials of products, although taste is also a key barrier.

Opportunities for imports of Western-style formats exist because of the high perception of Australian and New Zealand brands for environmental friendliness and naturalness.

There is a low price premium due to the high price of meat.

Government leadership is increasing for policy and investment in new technologies like cultivated meat.



Japan

Japan has a large meat substitutes market; however, growth is predicted to be lower than other markets at 9% CAGR to 2027.

Japanese consumers have strong meat-eating preferences with a relatively low desire to reduce meat intake, and traditional cuisine 'washoku', which is heritage-listed by UNESCO, recognises both the traditions and ingredients of Japanese food.

An increased desire for convenience presents opportunities to export Western-style products through foodservice and convenience retail channels.

Research reveals that consumers aged 18–24, high-monthly-income households, and ethical, premium, health-conscious and shoppers looking for unique products are more likely to buy plant-based meat.

Although there is no regulatory framework in place yet, research and government organisations have recently signalled the intention to progress safety, labelling and a path for the commercialisation of cultivated meat.

Thailand

Thailand presents a moderate meat substitutes market with strong growth of 14% CAGR expected to 2027.

Thailand provides a good entry point to Southeast Asia due to its business-friendly environment and prevalent co-manufacturing infrastructure.

The Thai Government has a 'Future Food' roadmap to support innovations including alternative proteins and 3D food printing, and the private sector has invested substantially in plant-based and cultivated meat.

High rates of flexitarian diets are driven by historical and cultural influences, an appetite for novelty, and a willingness to try innovative products.

There is evidence of rapid new product development in the local plant-based industry focusing on nutritional benefits, clean and natural positioning, and health.

Research reveals that consumers aged 18–24, those with high household incomes, and parents are more likely to consume plant-based meat products.

Citations

[1]Alexandratos, N., & Bruinsma, J. World agriculture towards 2030/2050: the 2012 revision (Vol. 12, No. 3). [Internet] FAO, Rome: ESA Working paper. 2012.[cited 2023 May 15] Available at: http://www.fao.org/docrep/016/ap106e/ap106e.pdf

[2]Statista. Meat Substitutes - Asia 2023. [Internet] 2023 Mar [cited 2023 May 15] Available from: https://www.statista.com/outlook/cmo/food/meat/meat-substitutes/asia

[3]Good Food Institute APAC. APAC alt protein investments soared in 2022. [Internet] 2023 Apr [cited 2023 May 15] Available from: https://gfi-apac.org/defying-economic-headwinds-apac-alt-protein-investments-soared-in-2022/

Market comparison

Market selection process and criteria

This report is based on five key markets in Asia: China, Singapore, South Korea, Japan and Thailand. These countries were selected as representing the greatest export opportunity for Australian and New Zealand businesses from a broader analysis of 11 countries across Asia, including India, Indonesia, Hong Kong, Vietnam, Malaysia and the Philippines. Figure 1 shows how the markets compared against the criteria below.

Market attractiveness was assessed using the following metrics:

Market size:
- Meat substitutes revenue —total, per capita and CAGR
- Meat substitutes volume —total, per capita and CAGR
- Premiumisation (which indicates a markets' willingness to pay higher prices)

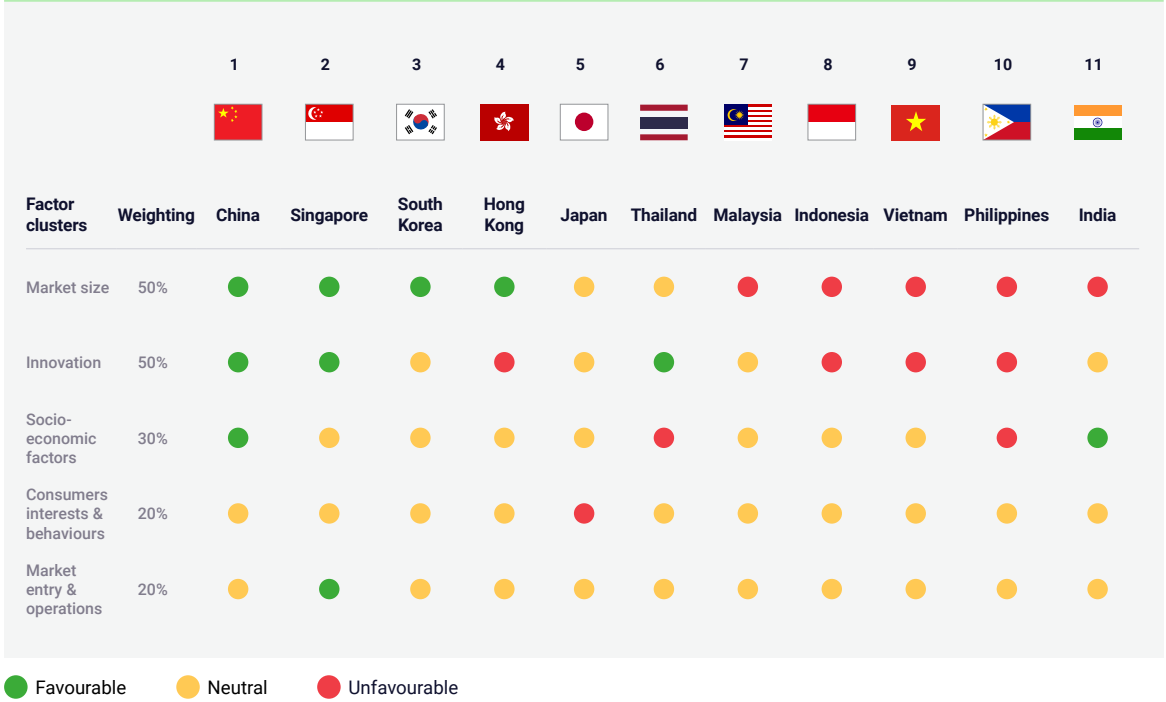
Innovation:
- Rate of innovation
- Investment in alternative proteins
- Number of alternative proteins accelerators and incubators
- Number of local and international alternative proteins companies

Socio-economic factors:
- Population
- Urban population
- GDP
- Disposable income
- Consumer price index

Consumer interests and behaviours:
- Psychographics
- Future financial situation
- Health concerns
- Limiting meat intake
- Choosing ethical foods
- Consumption of plant-based meat
- Interest in food produced via cellular agriculture
- Cultural aspects
- Perception of provenance – AU and NZ products

Market entry and operations:
- Regulations
- Government culture of facilitating change
- Preferential trade/strategic relationships
- Local manufacturing capability
- International and domestic logistics
- Retail landscape

Figure 1: Asian markets ranked according to their attractiveness for Australia and New Zealand exporters

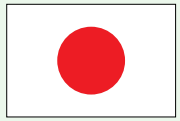


The five focus markets

China represents the most favourable market for Australian and New Zealand exporters, with a meat substitutes market size of USD2.13 billion (67% of the entire region) and is expected to grow annually by 20% (CAGR 2022–27).[1] This is supported by a high rate of investment in plant-based meat: China was second only to Singapore in dollars invested in alternative proteins in 2022,[2] as well as a growing urban and affluent population likely to be receptive to plant-based meat in support of a healthy lifestyle.[3]

Singapore is the second most favourable market with the highest meat substitutes' revenue per capita (USD2.34).[4] High rates of innovation, strong investment and favourable regulations are key factors supporting the growth of the plant-based meat and cultivated meat industries in this market.[5] Consumer interest in flexitarianism, ethical and sustainable consumption and health awareness are also contributing factors.[6]

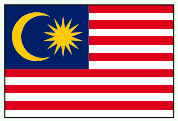
South Korea is the third most favourable market with a sizeable meat substitutes market at USD77.19 million in revenue and a projected 20% growth (CAGR 2022–27).[7] A healthy rate of innovation relative to other Asian countries makes this an appealing market for premium products.[8] The provenance perception of Australian and New Zealand food among consumers in South Korea ranks highly, with attributes of being environmentally friendly, trustworthy and having natural ingredients.



Japan is the fourth most favourable export market with the second-largest meat substitutes market size in revenue (USD247.5 million). Its relatively lower forecasted growth of 9% (CAGR 2022–27),[11]and less favourable consumer preferences due to less of a desire from Japanese consumers to reduce meat consumption, make Japan a comparatively less attractive market for exporters. Although Japan ranks neutral on other criteria, it performs relatively higher than countries not selected on ease of doing business, logistics performance and corruption index.

Hong Kong is the fourth most favourable market with the highest revenue per capita (USD3.34) and 17% projected growth (CAGR 2022–27)[9]; however, it is a semi-autonomous region of China. Given it has a relatively small population of approximately seven million, for this research it was deprioritised in favour of **Thailand**, which is ranked as the sixth most favourable market overall with a sizeable meat substitutes market (U$39.11 million)[10], a flourishing food manufacturing sector, and a population of more than 70 million.

Other markets considered



Malaysia is less attractive than the previously identified countries due to a comparatively small meat substitutes market (USD12.93 million). Malaysia has a fast projected growth rate at 19% (CAGR 2022–27)[12] and across other factors it performs in line with regional averages, including reasonable levels of innovation and investment[13] and well-developed infrastructure and distribution channels. Malaysia has a low ranking on the logistics performance index (3.15), below that of China and Thailand.[14]

Indonesia has a positive macroeconomic environment with rising levels of disposable income and a high urban population,[15] as well as a high projected growth rate for its meat substitutes market (18% CAGR between 2022–2027).[16] However, its plant-based meat sector is still in the early stages and is mostly dominated by traditional plant proteins (such as tempeh and tofu). Consumption of plant-based meat is also concentrated in high-income households.[17]

Indonesia also has lengthy procedures for determining product labelling as well as inefficient and high-cost logistics infrastructure.[18] Cold storage distribution is fragmented, which can be a barrier to entry for frozen and chilled products. However, the extended shelf life offered by ambient product formats could address some of these challenges.

Vietnam's meat substitutes market is still at a nascent stage and less developed compared to other Asian countries.[19] Although plant-based meat is perceived positively, price sensitivity is a key barrier, especially when traditional plant proteins are widely available at affordable prices.[20]

Although Filipinos have a positive perception towards traditional plant proteins[21] and are familiar with Western food culture,[22] the **Philippines** has the lowest meat substitutes market revenue in the Asian region (USD11.95 million in 2022).[23]

With the world's largest vegetarian population[24] and relatively low competition from international plant-based meat companies, **India** might appear to be an obvious choice for the export of plant-based meat products.[25] However, traditional plant protein dishes such as dahl are widely eaten, and the majority of vegetarian Indians are unlikely to see a need to substitute their existing choices or pay a higher price for plant-based alternatives. India has recently taken over from China as the most populous country in the world, but its meat substitutes market is relatively small at USD35.65 million with a slower growth rate (11.5% CAGR 2022-2027) than neighbouring countries and the lowest revenue per capita.[26] India also has underdeveloped distribution channels, especially cold chain distribution,[27] and relatively higher tariff rates for foreign goods compared to other markets.[28] From a regulatory perspective, there is a higher risk of unfavourable regulations exemplified by the restriction of the use of the term 'dairy' in plant-based offerings.[29]

Market size and investment

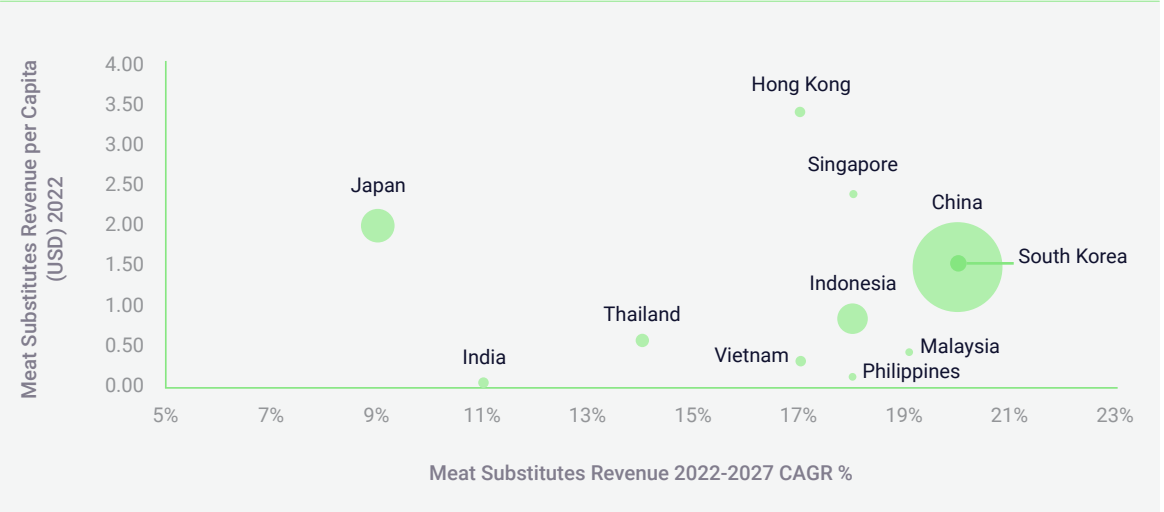
Meat substitutes revenue, growth and market size

Of the five focus countries, China has the largest meat substitutes market (USD2.13bn, 67% of the region) and the fastest market growth (20% 2022–27).

Along with South Korea, China also has the highest projected growth in the next five years. In terms of revenue per capita, Singapore and Japan stand out. However, Japan has relatively slower growth, as Figure 2 shows.

Singapore leads in public and private investment in the sector in 2022; followed by China, South Korea, Japan and Thailand, as Table 1 shows.

Figure 2: Meat substitutes market revenue size & growth, by selected Asian markets



Source: Statista.
Note: The size of the bubble represents the total meat substitutes revenue in USD millions in 2022.
As defined by Statista, the meat substitutes segment covers plant-based meat and mock meats.

Table 1: Annual investment in alternative protein companies, 2022 (except Thailand, 2021)

	China	Singapore	South Korea	Japan	Thailand	APAC Total
Annual investment	USD152 million	USD170 million	~ USD48 million	~ USD28 million	~ USD13 million	USD562 million

Source: GFI APAC for 2022 figures, Mintel for 2021 figure.

Ease of doing business

Based on the scores across measures of ease of doing business, logistics, and corruption perceptions, Singapore exhibits the most favourable business conditions,followed by South Korea and Japan.

China and Thailand rank highest on the corruption perception index. Counter balancing this, both rank high on ease of doing business and logistics, potentially offering good opportunities for exporters.

Table 2: Business, logistics and corruption indicators across focus markets, compared to Australia and New Zealand

	China	Singapore	South Korea	Japan	Thailand	Australia	New Zealand
Ease of doing business index[a] 2020 (1–100 score)	77.9	86.2	84	78	80.1	81.2	86.8
Logistics performance index[b] 2018 (1–5 score)	3.61	4	3.61	4.03	3.41	3.75	3.88
Corruption perception index[c] 2021 (1–100 score)	45	85	62	73	35	88	88
Total performance across indicators (1–100 score)	65	83.7	72.7	77.2	61.1	81.4	84.1

- Most favourable
- More favourable
- Less favourable
- Least favourable
- Reference countries

Sources: Doing Business, The World Bank, Transparency International.

[a]The Ease of Doing Business Index from the World Bank measures business regulations affecting small and medium-size companies in each market. It covers 12 areas, including starting a business, getting credit, paying taxes, trading across borders and enforcing contracts.

[b]The World Bank Logistics Performance Index takes into consideration a number of factors, including efficiency in the clearance process, transport infrastructure and timeliness of shipments reaching their destination.

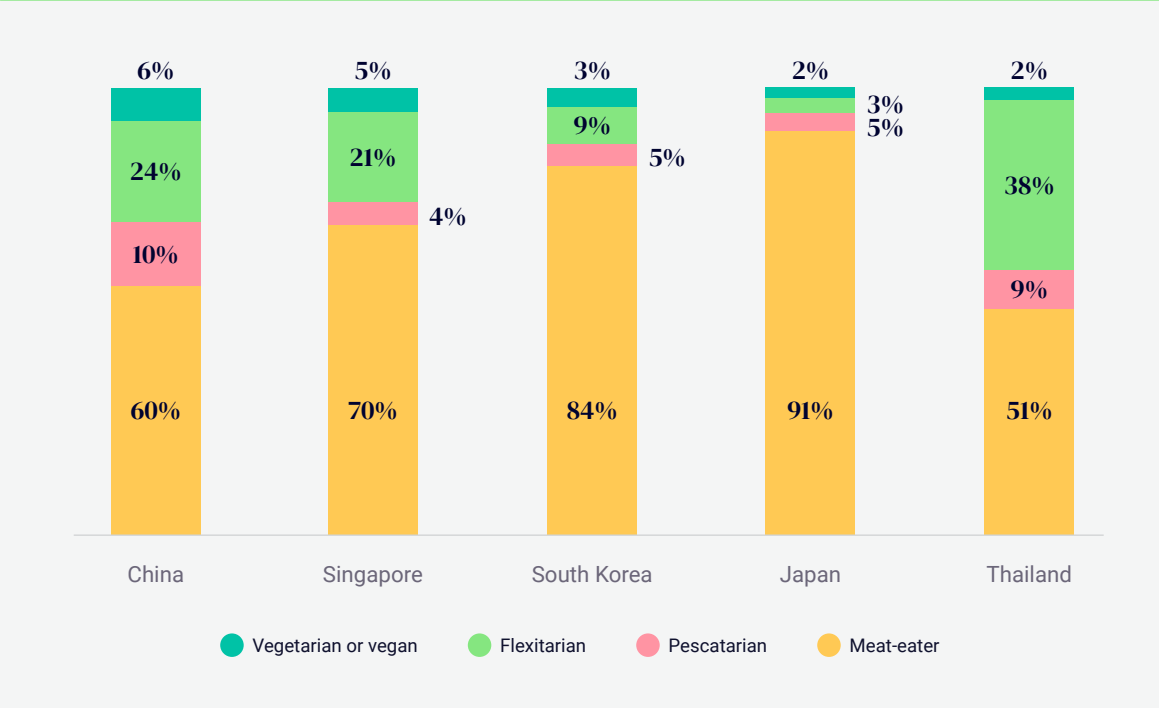
[c]The Corruption Perception Index is the most widely used global corruption ranking in the world, measuring how corrupt each country's public sector is perceived to be, according to experts and businesspeople.

Dietary preferences

In the five focus markets, the majority of consumers describe their eating habit as ‘meat-eater’.

Japan has the highest proportion of self-reported meat eaters (91%), followed by South Korea (84%). Thai consumers have the highest level of flexitarianism (38%)—a diet made up of mostly plant foods and occasionally animal meat but also including pescatarianism—indicating a willingness to try plant-based meat and other novel protein products. This is followed by China (24%) and Singapore (21%). In all markets, vegetarians and vegans are the minority, representing between 2% and 6% of all consumers.

Figure 3: Consumers’ dietary preference



Base: 1,000 internet users aged 18–45+ per market.
Source: KuRun/Mintel (China); Rakuten/Mintel (Singapore, Japan); Dynata/Mintel (South Korea, Thailand).
Meat-eaters eat red meat or poultry.
Flexitarians eat plant-based options at some meals, replacing red meat, poultry, fish/seafood, eggs or dairy.
Pescatarians eat no red meat or poultry but eat fish/seafood, dairy and eggs.
Vegetarians eat no red meat/poultry or fish/seafood but eat dairy and eggs.
Vegans eat no animal products.

Plant-based meat consumption

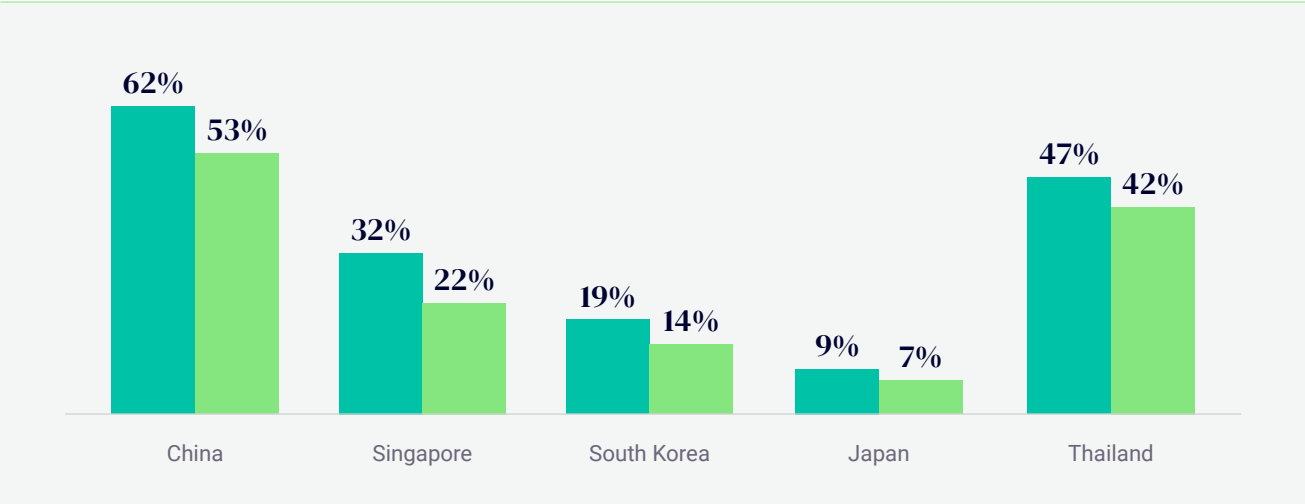
Consumption and purchase of plant-based meats is highest in China, followed by Thailand. Sixty-two percent of Chinese consumers surveyed report consuming plant-based meat in the previous six months. Despite definitions supplied at the start of the survey explaining the separation of plant-based meat products from traditional plant proteins and mock meat, the number of consumers in China reporting eating plant-based meat products was high. In-country experts conjecture that this may reveal a misunderstanding among survey respondents about the differences between these product types. The difference between traditional plant proteins and the new generation of plant-based meats was clarified with survey participants to the best of the researchers' abilities.

Thai consumers also reported high levels of plant-based meat consumption. In Japan, where the population is strongly aligned with meat-eating, fewer consumers have trialled plant-based meats. In most markets, both flexitarians and meat eaters contribute to the purchase of plant-based meats, but the purchase rate is usually higher among flexitarians.

In all markets, the majority of plant-based meat buyers purchase these products regularly; many reporting that they purchase plant-based meat two to three times per month or once a week or more. These numbers should be treated with caution and may not be reflected in actual sales data from the markets, for several reasons. As mentioned previously, despite being given a definition of plant-based meats during the in-market survey, the respondents may be considering mock meats and other meat substitutes as part of the plant-based meat category, conflating their consumption of these products as consumption of plant-based meats. Similarly, any variance might be accounted for by a tendency (termed by academics as the 'intention-behaviour' gap),[30] whereby consumers may answer questions or surveys in line with their values on how they intend to or would like to act, but actual exhibited behaviour does not follow through on the reported intention.[31]

In China, Japan and Thailand, plant-based meat buyers tend to choose chilled products, whereas in Singapore and South Korea, frozen products are more popular. 'Crumbed chicken-style' (for example, nuggets and tenders) is the most widely available and purchased format of plant-based meats across all five markets.

Figure 4: Consumption of plant-based meat



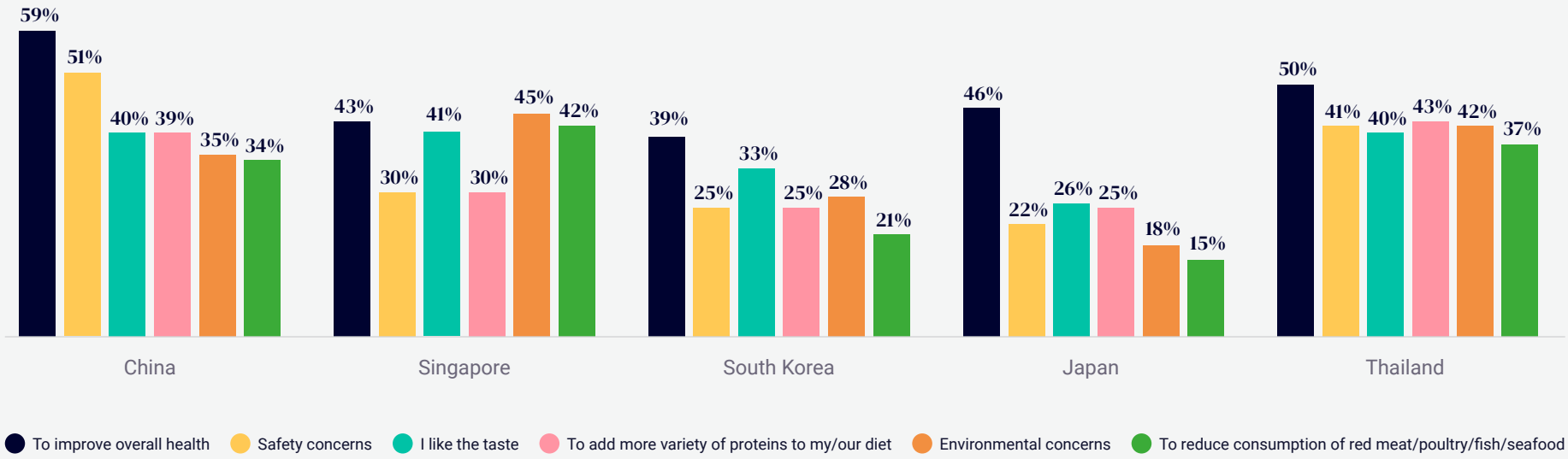
Base: Plant-based meat consumers: 1,000 internet users aged 18–45+ per market; Plant-based meat purchasers: 995 (China), 950 (Singapore), 934 (South Korea), 828 (Japan), 957 (Thailand) internet users aged 18–45+ who shop for groceries in the household.

Source: KuRun/Mintel (China); Rakuten/Mintel (Singapore, Japan); Dynata/Mintel (South Korea, Thailand).

Drivers

Consumption drivers vary across markets and demographics. Health is by far the most common plant-based meat consumption driver, except in Singapore, where environmental concerns also take high priority.

Figure 5: Reasons for consuming plant-based meat products



Base: Reasons for consuming 591 (China), 283 (Singapore), 160 (South Korea), 68 (Japan), 447 (Thailand) internet users aged 18–45+ who have consumed plant-based meat products in the last six months and would consider consuming again and are planning to consume the same or more in the future. Caution: Japan has a small base size.
Source: KuRun/Mintel (China); Rakuten/Mintel (Singapore, Japan); Dynata/Mintel (South Korea, Thailand).

In all markets, health attributes, ease of preparation and meat-like quality are the factors that consumers consider when purchasing plant-based meats, as Table 3 shows.

In China, high protein content and the use of all-natural ingredients are cited as the most important factors among both plant-based meat buyers and those interested in buying the products. China places more importance on environmental and organic qualities than any of the five focus markets.

High protein content is also the most important factor for consumers in Thailand; in Singapore and South Korea ease of cooking and preparation are more important than other factors; whereas consumers in Japan prefer meat-like quality of plant-based meat products.

Table 3: Most important plant-based meat purchasing factors

	China	Singapore	South Korea	Japan	Thailand
High protein content	51%	42%	31%	35%	53%
Easy to cook/prepare	35%	54%	37%	36%	43%
Added health benefits (e.g. helps digestion, bone health)	48%	45%	28%	25%	49%
Flavour similar to animal meat/fish/seafood	36%	46%	36%	45%	43%
All-natural ingredient list	52%	47%	22%	27%	32%
Environmentally produced	42%	36%	28%	17%	38%
Organic	43%	26%	22%	20%	37%

Deviation from averaged response across all attributes

>15% 10-14% 5>9%

Base: 949 (China), 774 (Singapore), 793 (South Korea), 398 (Japan), 913 (Thailand) plant-based meat purchasers aged 18–45+ who would consider purchasing again or non-plant-based meat purchasers who would consider purchasing in the future.
Source: KuRun/Mintel (China); Rakuten/Mintel (Singapore, Japan); Dynata/Mintel (South Korea, Thailand).

Price

Like in many markets worldwide, the price of plant-based meat is a barrier for Asian consumers. Plant-based meats, compared to conventional equivalents, are sold at a substantial price premium in most markets.

Across all markets, high-income families are more likely to purchase and consume plant-based meats. The majority of consumers, except in Thailand, indicate they will buy plant-based meat products if they are the same price or cheaper than conventional meat equivalents.

Consumers in Japan are more price-sensitive towards plant-based meats; their value perception of, and therefore willingness to pay for, the products is not as favourable. Japanese consumers expect quality products at a lower price than conventional meat.

The lowest price premium is in South Korea where animal products are expensive and there is greater competition between domestic plant-based meat brands.

China and Singapore have the highest premium for plant-based meat products above conventional meat equivalents. Although Singapore is seen as a wealthy country, consumers expect high-quality food to be consistently available at affordable prices and the reputation of its famous hawker centres, serving low-cost meals, is a source of national pride. Additionally, in China, the snack category has enjoyed a positive market growth in the past few years driven by consumers' habitual snacking and the pursuit of healthy and quality products.[32]

Thailand is the least price-sensitive market, where it was found that the desire to live a healthier lifestyle is driving demand for wholesome, nutritional food, and contributing to a growing appreciation of plant-based food amongst Thais.

Right: Omni-Lolli-Pork, created to add fun to the classic sweet and sour pork dish, is described to have a bouncy texture—crispy outside and soft inside. Skewer Platter features plant-based meat skewers marinated with different sauces including Malay Satay, Ginger Scallion Sauce and Fried Green Onions.

Consumer perceptions of cellular agriculture

Cultivated meats and products of precision and biomass fermentation are nascent industries in Asia and around the world. Research shows consumers from the five focus counties are uncertain about the taste and processing of these foods and are generally unfamiliar with foods made using these technologies.

As Table 4 shows, in Singapore, the only market in Asia where where cultivated meat is approved for sale, the majority of consumers have heard of cultivated meat but Singapore nevertheless sits in the middle of all five markets when it comes to the likelihood of purchase. Consumers in China followed by Thailand and Singapore were the most willing to try cultivated meat, which correlates with data from previous consumer acceptance research undertaken in the region.[33] Most consumers agreed that cultivated meat is environmentally friendly.

For products of precision and biomass fermentation, China leads the way in consumer awareness and is second overall in the likelihood of purchasing these products. Thailand was again the most enthusiastic market with Singapore, South Korea, and Japan (respectively) indicating they are least likely to consume these products. Again, most consumers view products of precision and biomass fermentation as good for the environment.

Except for Thailand, all five markets have regulatory discussions underway concerning cultivated meat and products of precision and biomass fermentation. The industry is evolving rapidly and start-up companies as well as government investment activities are recorded across all markets. Consumer perceptions are expected to change as products become more familiar, but public education will be critical to increase awareness and acceptance.

Table 4: Awareness of and willingness to purchase cultivated meat

Country	Awareness of cultivated meat	Definitely would purchase	Likely to purchase
China	39%	17%	57%
Thailand	33%	34%	35%
Singapore	53%	6%	33%
South Korea	29%	3%	29%
Japan	20%	2%	10%

Table 5: Awareness of and willingness to purchase products of precision and biomass fermentation

Country	Awareness of precision and biomass fermentation	Definitely would purchase	Likely to purchase
China	48%	21%	59%
Thailand	36%	36%	37%
Singapore	28%	7%	37%
South Korea	14%	3%	34%
Japan	11%	1%	12%

Manufacturing, sourcing and ingredients

There are several similarities and differences between the markets' supply chains upstream (for example, raw materials, processing, technology, and co-manufacturing), downstream (for example, brands and marketing), and distribution channels (for example, retail and foodservice). Table 6 highlights some of the key similarities and differences.

Table 6: Value chain comparison

Market similarities	Market differences
• Given its wide availability and price competitiveness, soy is the dominant plant protein ingredient used in plant-based meat products and the majority of it is imported in all markets. Furthermore, soy generally maintains positive perceptions in Asia. It is seen as a healthy ingredient with a long history of consumption. • About 80% of the Southeast Asia region is working with low moisture extrusion (LME), which is commonly used to make plant-based meat products, especially ambient formats. • There are co-manufacturing facilities across markets including China, Thailand and Singapore, but most of them use LME, which is cheaper than high moisture extrusion (HME) technology commonly used in markets like Europe and the United States.	• China grows protein-rich crops suitable for processing and use in plant-based meats, such as peas, faba beans, mung beans and wheat, while Thailand grows crops less commonly used in plant-based meat like rice and jackfruit. • Singapore has the greatest high moisture extrusion (HME) capabilities including several co-manufacturing facilities. HME enables greater meat-like texture for formats like pulled pork-style and chicken-style strips. • China, Japan and South Korea are larger markets which may justify them as preferred export destinations, but international players may need to look at producing locally for these markets, particularly for China. • China, Japan and South Korea are larger markets that offer international brands potential to leverage infrastructure and ingredient sourcing for local production to optimise costs, especially in China.

Trade agreements

Australia and New Zealand have trade offices in many countries across Asia to assist with local regulations and business requirements. Exporters should ensure they are aware that free trade agreements also facilitate trade between Australia and New Zealand in both bilateral and multilateral frameworks. Australian and New Zealand exporters can also utilise the resources of expert import agents to navigate complex local laws and connections to the trade.

Table 7: Trade agreements

	Australia	New Zealand	Regional
China	The China-Australia Free Trade Agreement (ChAFTA)	New Zealand-China Free Trade Agreement (NZ-China FTA)	Regional Comprehensive Economic Partnership Agreement (RCEP)
Singapore	Singapore-Australia Free Trade Agreement (SAFTA) Singapore-Australia Green Economy Agreement	New Zealand-Singapore Closer Economic Partnership (CEP)	Transpacific Strategic Economic Partnership (P4) Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) ASEAN-Australia-New Zealand Free Trade Agreement (AANZFTA) Regional Comprehensive Economic Partnership Agreement (RCEP)
South Korea	Korea-Australia Free Trade Agreement (KAFTA)	Korea-New Zealand Free Trade Agreement (KNZFTA)	Regional Comprehensive Economic Partnership Agreement (RCEP) Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP)*
Japan	Japan-Australia Economic Partnership Agreement (JAEPA)		Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP)
Thailand	Thailand-Australia Free Trade Agreement (TAFTA)	New Zealand-Thailand Closer Economic Partnership (CEP)	ASEAN-Australia-New Zealand Free Trade Agreement (AANZFTA) Regional Comprehensive Economic Partnership Agreement (RCEP)

*South Korea confirmed in 2022 that it would apply to join the CPTPP.

Definitions and classifications

China and Japan are the only countries in the five markets analysed that currently have definitions in place for plant-based meats.

Singapore has a definition of products of biomass and precision fermentation; Singapore and Japan have definitions for cultivated meat. It is expected that most countries will adopt definitions for the various categories over the next decade.

Table 8: Definitions of alternative proteins, focus markets compared to Australia and New Zealand

Country	Plant-based meat	Precision and biomass fermentation	Cultivated meat
China[a]	Voluntary group standard[b]		
Singapore		Novel food guide[d]	Novel food guide[d]
South Korea			
Japan	MAFF Report[c]		MAFF report
Thailand			
ANZ	APC voluntary labelling guidelines		

Established

Not established

[a]There is a legal definition for meat analogues or substitutes.
[b]Voluntary group standard: T/CIFST 001-2020 Plant-Based Meat Products.[34]
[c]MAFF: Ministry of Agriculture, Forestry and Fisheries report.[35]
[d]Singapore Food Agency (SFA) guide on Requirements for the Safety Assessment of Novel Foods and Novel Food Ingredients.[36]

Plant-based meats sales are permissible across all markets, with some exceptions for novel ingredients. China and Japan have established specific definitions for plant-based meat products.

Cultivated meat and proteins from precision and biomass fermentation require pre-market approval across all jurisdictions with the exceptions of the sale of mycoprotein in China and for foods with a history of consumption in Japan.

Singapore has an established regulatory framework for cultivated meat and novel foods. China, South Korea and Japan are currently in discussions regarding their respective approaches to regulating these products. There are no upcoming regulatory framework changes for cultivated meat and proteins from precision and biomass fermentation in Thailand, although continued investment in the sector will likely instigate regulatory progress, just as has been initiated in other markets. Japan's current regulations may accommodate certain novel proteins providing a history of consumption can be demonstrated. However, it should be expected that a regulatory framework will be developed to meet the need for public confidence in the safety of novel food products. The momentum from the United States' 2023 June approval of two cultivated meat products as safe to eat may accelerate the development of similar evaluation systems in other markets, including in Asia. Table 9 provides further information about regulations under development.

Table 9: Permissibility of alternative proteins across focus markets, compared to Australia and New Zealand

Country	Plant-based meat	Fermentation-derived protein[a]	Cultivated meat
China		Mycoprotein	
Singapore		Biomass and precision fermentation	
South Korea			
Japan		History of consumption needs to be proven	
Thailand		Biomass and precision fermentation	
ANZ			

Permitted

Permitted once pre-market approval is obtained

[a]Provided they are not obtained from unconventional sources, i.e., not considered novel.

In all the focus markets, plant-based meat, fermentation-derived products and cultivated meat that are made of genetically modified ingredients or organisms must be pre-authorised before they can be sold in the market.

There are no specific labelling requirements for alternative proteins as foods or as ingredients in any of the focus markets.

Since there are no prescribed names or common/usual names for plant-based or cultivated meat products in China, Singapore, South Korea, Japan and Thailand, descriptive names must be used. The name of the meat equivalents (such as 'burgers', 'mince' or 'sausages') may be used provided the qualifying terms (as recommended below) are provided in conjunction. In October 2022, more than 30 industry stakeholders, led by GFI APAC and APAC Society for Cellular Agriculture, signed an MOU for aligning on nomenclature to use the preferred term "cultivated" when referring to foods grown from directly from animal cells.

China, Japan and South Korea have upcoming or in-discussion regulations for alternative proteins. A clear and well-defined regulatory framework for cultivated meat in Singapore has been established for novel foods, including cultivated meat.

Table 10: Product labelling requirements

Products	Recommended qualifying terms to be included as part of product names in all markets
Plant-based products	'Plant', 'plant-based', 'plant protein' or 'plant-derived'
Cultivated meat / cellular agricultural products	'Cultured', 'cell-based' or 'cultivated'

Table 11: Upcoming/in-discussion regulations

Markets	Upcoming / in-discussion regulations
China	Draft Recommended National Food Safety Standard Terminology and Classification of Veggie Meat Analogues[37] and scientific work on cultivated meat was initiated in 2020.
Singapore	None, as a framework for cultivated meat products and fermented products has already been formed under novel foods.
South Korea	Work on formulating legislation for meat alternatives, including definition, specification and labelling, as well as safety assessment of technologies for cultivated meat, has commenced, and it is expected to be prepared by 2024.
Japan	An official group to develop a regulatory system that allows the commercial use of cultivated meat was formed in June 2022. At the same time, it was reported that the Ministry of Health, Labour and Welfare would form a research team of experts to discuss the need for new rules regarding cultivated meat by March 2023.
Thailand	None

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China

Summary

China is the world's second-largest economy and it is the most favourable country in Asia for Australian and New Zealand exporters of alternative proteins.

China is a meat-loving country but meat reduction sentiment is growing among consumers, signalled also by government. The cultural trend known as Guochau, combining cultural traditions and national pride, also creates high demand for modern Chinese products. Australian and New Zealand exporters can capture Chinese market share through ingredient imports and localised products by working in partnership with Chinese businesses, whether for importation and distribution or contract manufacturing for branded, co-branded or white label products.

China is Asia's largest meat substitutes market, accounting for 67% of the region's total meat substitute revenue, with fast growth and high premiumisation projected.

China is Asia's largest meat substitutes market, accounting for 67% of the region's total meat substitute revenue[1], with fast growth and high premiumisation projected. The Chinese meat substitutes market had an estimated revenue of USD2.13 billion in 2022, which equates to USD1.47 per capita. High rates of investment in the sector and a large urban and affluent population receptive to plant-based meat are driving demand. The volume of meat substitutes retailed in 2022 was 144.9 million kg, equivalent to 0.1 kg per capita. With a projected 37% CAGR (volume) between 2022 and 2027, volumes could reach 688.5 million kg by 2027.

The Australia-China bilateral relationship is based on strong economic and trade complementarities and longstanding community and cultural links.[2] The Chinese Government imposed unofficial bans and tariffs on some Australian exports in 2020, but Australian coal shipments were cleared to enter China in early 2023 as diplomatic relations between the two nations improved in mid-2022.[3] Australian businesses successfully enter and operate in the Chinese market,[4] though some also pursue market diversification. New Zealand has a strong, uninterrupted trade relationship with China, with exports of 'knowledge economy' services (such as food safety) increasing.[5]

> **Plant-based meat is a complex category in China. A lot of big food and drink companies have included plant-based meat in their future strategy, and the Chinese Government has also shown support by publishing industry voluntary regulation.**
>
> **In recent years, venture capitalists have eyed this emerging category and invested in lots of start-up brands. However, plant-based meat brands in China still need to overcome consumption barriers, as the category has not yet provided a strong benefit to drive a switch from animal to plant-based protein, let alone addressed the higher price and a compromised taste.**
>
> **Daisy Li**
> Mintel Food & Drink Associate Director, China

Market landscape

Socio-economic and cultural factors

China has a GDP of USD17.7 trillion, the world's second-largest GDP.[6] According to the World Bank, since its economic liberalisation in the late 1970s, China's GDP growth has averaged 9% per year, leading to substantial gains in health, education and other services.[7] In 2022, China's Zero-COVID strategy, domestic challenges in the property sector, and slowing global demand led to a sharp decline in economic growth to just 3.2%[8] but the economy is expected to improve from 2023, with a growth rate of around 4.9%.[9] China is the world's third-largest destination for foreign direct investment,[10] and it is the largest importer of agricultural products.[11] Chinese President Xi Jinping has highlighted the importance of alternative proteins for food security and to address sustainability.

The World Bank's Logistics Performance Index ranks China twenty-sixth globally with a score of 3.61 out of 5.[12] This index includes factors such as efficiency in clearance processes, transport infrastructure and timeliness of shipments reaching their destination. This score is above the regional average of 3.15 for East Asia and the Pacific but below Singapore (4.0) and Japan (4.03).

China has been until recently the world's most populous nation,[13] is highly urbanised, and has high GDP per capita growth.[14] It is a leading exporter of plant protein ingredients, accounting for 55% of the global soy protein isolate and 44% of the global soy protein concentrate trade, exported mainly to Russia, the Philippines, Japan and the US.[15]

Traditional plant proteins (such as tofu) are very popular in China, which has the highest average daily consumption of these products in Asia.[16] Tofu is often served alongside meat in dishes like mapo tofu, so it is not necessarily viewed as a meat replacement ingredient in this market in the same way as it is in many Western markets.

Increased meat consumption is associated with wealth and prosperity in China. This association and the potential association of traditional mock meats (seen as cheap and lower-quality) with newer plant-based meats could present a barrier to the uptake of these new generation products.

Consumers in tier-one cities like Beijing and Shanghai are traditionally more open to new foods, experiences and spending on luxury goods than those in smaller cities and regional centres.[17] However, this has changed in recent years as people in smaller cities increase their disposable income and interest in new experiences and offerings, which may provide new and growing markets for exporters looking beyond tier-one cities.[18]

Retail and foodservice landscape

China's total food revenue was USD1,386 billion in 2022, with an expected annual growth rate of 9.3%[19]. Supermarkets and hypermarkets are the most common grocery channels, followed by convenience stores, natural supermarkets, wet markets, traditional markets and street vendors.

Industry experts advise that offline and traditional outlets sell plant-based meat, but sales are stronger through online outlets. 'New retail' (such as Hema, a high-tech grocery that converges online and instore shopping using consumer data, robots and digital currency) targets younger customers who are less likely to shop in traditional retail outlets.[20] Plant-based meat products in China tend to be launched on e-commerce platforms before launching in retail stores: e-commerce platforms are a good way to test market receptiveness and have lower up-front costs.

Convenience stores and food delivery channels, which are more commonly used by middle and high-income consumers seeking convenience and bulk purchasing, also offer exporters good avenues for market expansion. These channels have become more popular for lunch and dinner, especially in tier-one cities: for example, fast-food chain Dicos has plant-based offerings that can be ordered on takeaway apps Ele.me and Meituan.[21]

FamilyMart, a leading convenience store brand, sells plant-based meat products, including PlantPlus snacks.[22] Specialty stores that sell vegetarian food are also popular and can have a stable customer base and repeat purchasers. These stores have also launched online on Tmall and Taobao. Other leading online stores include JP and Pinduoduo.

International brands tend to enter China via international retailers and quick-service restaurants (QSRs), including by leveraging existing relationships with international QSRs operating in China. QSRs and coffee shops actively promote plant-based meat items on menus, mostly presented in Western-style formats, including sandwiches, burgers, wraps and nuggets. Also, many menu items result from collaborations between foodservice outlets and plant-based meat brands aiming to increase product visibility and consumer awareness, with international players (such as Impossible Foods, Beyond Meat and Omni) and home-grown brands (such as Starfield), among the leading plant-based meat brands.[23] Collaborations with QSRs raise awareness and trial of plant-based meat products, which may then become permanent fixtures on menus. Some local companies have been successful in building awareness and consumer connection through direct-to-consumer channels or by collaborating with domestic QSRs and tea shops to increase visibility. Some local brands also rely on celebrities to increase exposure.

In supermarkets, frozen plant-based meats are usually sold alongside frozen conventional meats (such as meat dumplings). Shelf-stable, plant-based meat snacks (such as jerky) are usually placed near the snacks area alongside traditional tofu and soy-based snacks. In China, the packaging of plant-based meat products commonly shows their resemblance to meat equivalents.[24] Unlike conventional meats, which come in pack sizes from individual-portion to value packs, plant-based meat products in China typically retail in smaller 150 to 500g packs.[25]

Plant-based meat products in China tend to be launched on e-commerce platforms before launching in retail stores, as it is a good way to test market receptiveness with lower up-front costs.

Consumers

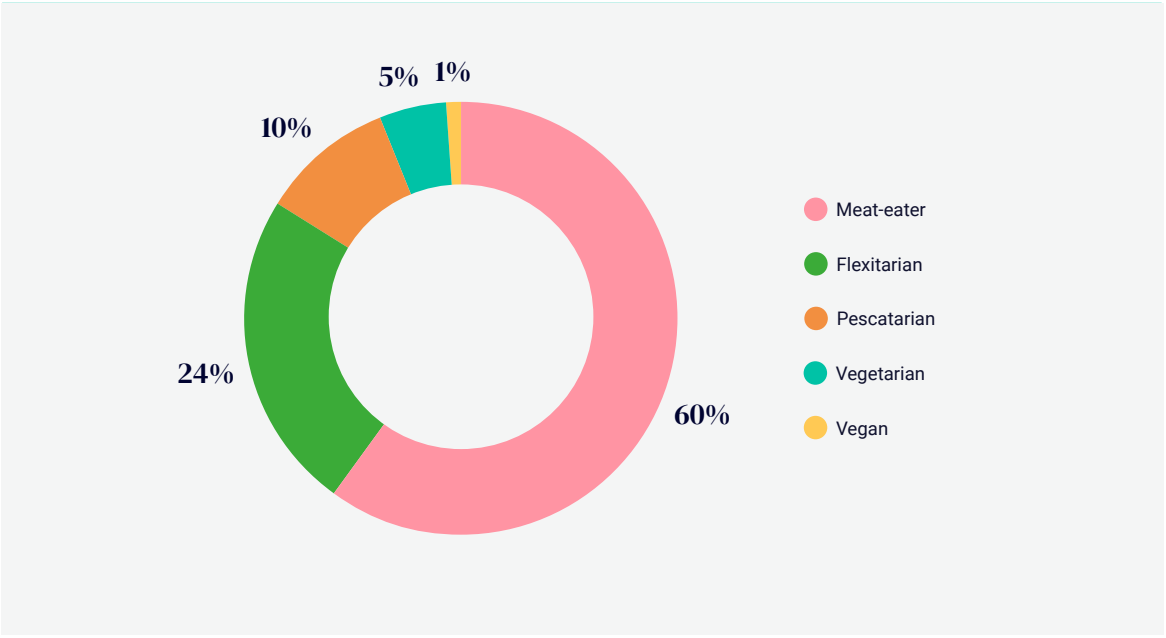
Dietary preferences

In China, meat consumption symbolises status and wealth[26] and most Chinese are meat eaters. Despite this, China has the highest average daily per capita protein consumption in Asia from plant-based foods.[27] Traditional plant proteins (such as tofu) are very popular and date back to the Buddhist population of the Han dynasty, which adopted a partial or fully vegetarian diet.[28]

Historical food preferences and the pursuit of a healthy lifestyle[29] results in one-quarter of Chinese consumers identifying as flexitarian, as Figure 1 shows. When looking at the flexitarian population by age, people aged 45 years and older are more likely to identify as flexitarian (34%) compared to the general population (24%), indicating that older Chinese are reducing their meat consumption more readily than younger Chinese. In addition, 10% of Chinese identify as pescatarian, 6% as vegetarian and approximately 1% as vegan.

One-third of Chinese say they intend to reduce their intake of at least one type of meat, including poultry, red meat, and fish/seafood, as Figure 2 shows. Flexitarians are the most likely to reduce their meat consumption. One-quarter of people with other dietary preferences say they intend to reduce their consumption of at least one type of meat.

Figure 1: Dietary preferences



Base: 1,000 internet users aged 18-45+
Source: Rakuten Insight/Mintel.
Meat-eaters eat red meat or poultry.
Flexitarians eat plant-based options at some meals, replacing red meat, poultry, fish/seafood, eggs or dairy.
Pescatarians eat no red meat or poultry but eat fish/seafood, dairy and eggs.
Vegetarians eat no red meat/poultry or fish/seafood but eat dairy and eggs.
Vegans eat no animal products.

One-third of Chinese say they intend to reduce their intake of at least one type of meat, including poultry, red meat, and fish/seafood.

Plant-based meat consumption

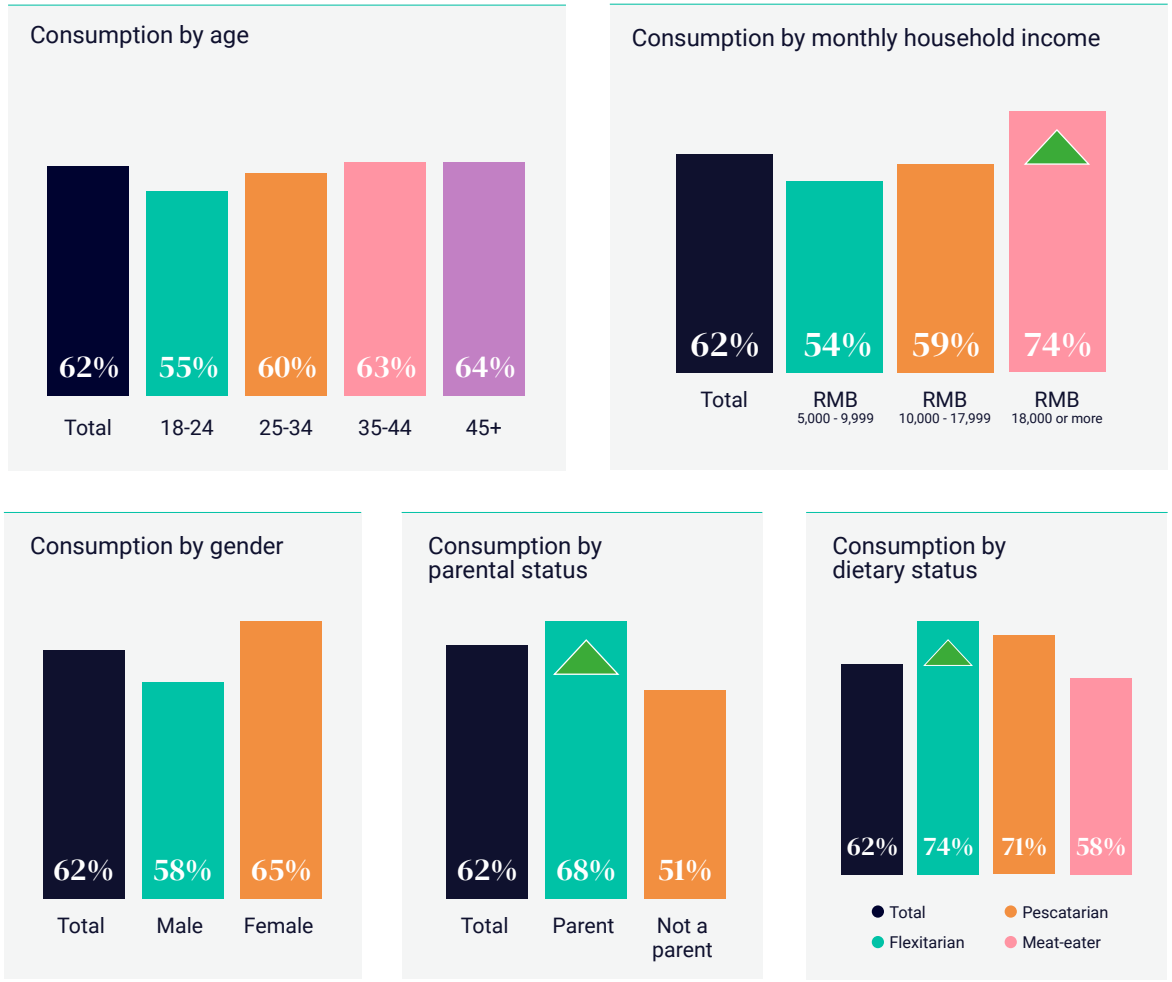
Based on industry interviews and local research undertaken by DATA100, there is a high level of confusion amongst consumers in China about what constitutes plant-based meat.[30] Interviews suggest that consumers might have confused traditional mock meats with modern plant-based meat offerings.

Sixty-two percent of Chinese say they had consumed plant-based meat at home or at a restaurant or food outlet in the past six months. Just over half (53%) say they have purchased plant-based meat at a retail outlet to eat at home. More than half (55%) of Chinese claim health as one of their top concerns, which is most prevalent among people aged 18–24 (65%).[31]

Figure 2 shows that a greater percentage of women than men consume plant-based meat, that consumption increases with age and household income, and a greater percentage of parents consume plant-based meat than non-parents. Product preferences differ across age groups. Consumers aged 18–24 prefer shelf-stable plant-based meat, whereas consumers aged 45+ prefer chilled or frozen products.

Industry interviews indicate that the growing number of single people in China has led to a surge in the 'lonely economy', where people delay children and marriage and are less likely to live with their extended family. These single people are said to enjoy eating alone and to value 'me-time' out of their '996'[32] working schedule: '996' refers to the common Chinese practice of working 9 am to 9 pm, six days a week.[33]

Figure 2: Plant-based meat purchase and consumption, by demographic



Base: 1,000 internet users aged 18-45; 950 internet users aged 18-45+ who shop for groceries in the household.
Source: Rakuten Insight/Mintel.

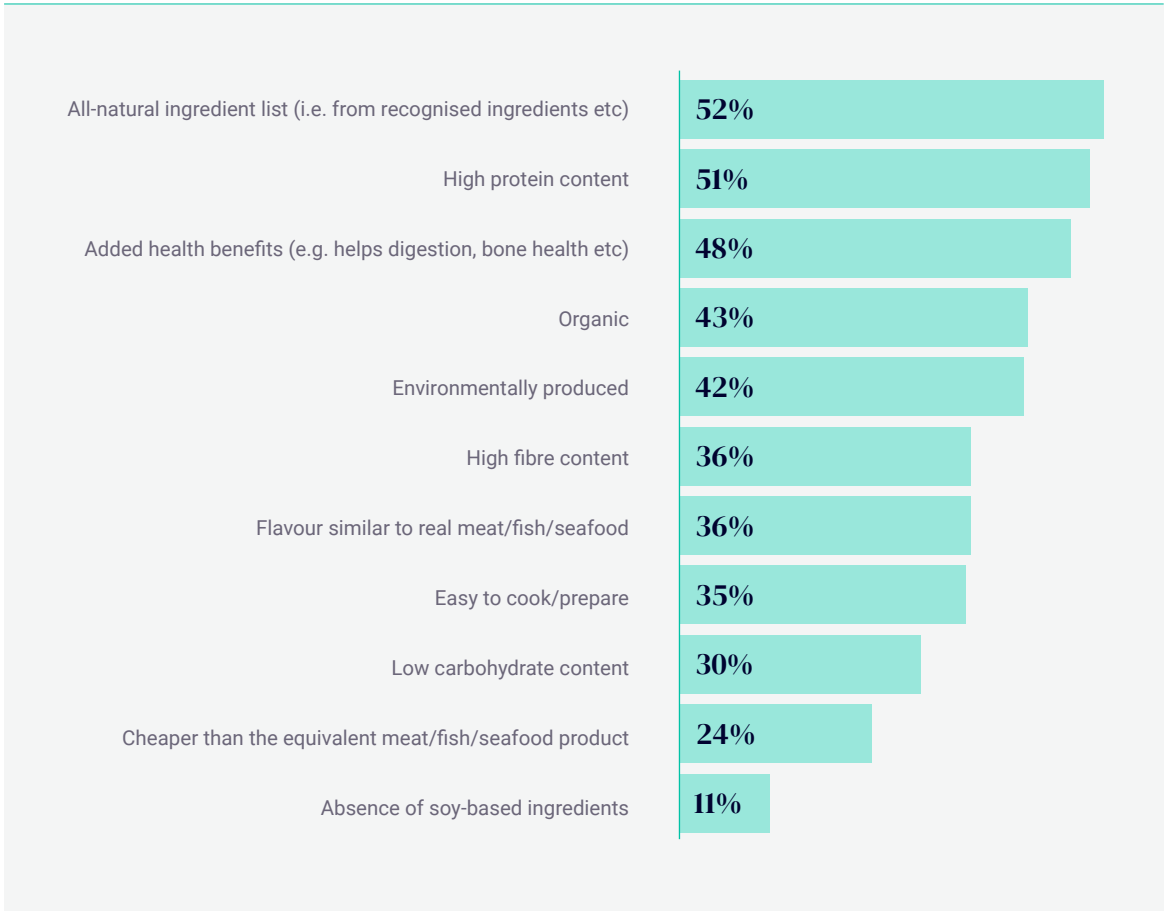
▲ Significantly higher than total at 95% confidence interval. ▼ Significantly lower than total at 95% confidence interval.

Drivers

Chinese consumers' main drivers for buying plant-based meats are improving overall health (59%), safety concerns including avoiding animal-borne diseases (51%), liking the taste (40%), adding more variety of proteins to their diet (39%), environmental concerns (35%), and reducing consumption of red meat, poultry, fish and seafood (34%).

When purchasing plant-based meat products, the top three considerations are natural ingredients, high protein content and health benefits, as Figure 3 shows. This combination of benefits will appeal to eight in ten consumers. Industry experts indicate consumers are willing to try products that deliver on taste and are interested in product benefits, including not containing antibiotics, added hormones, trans fats or cholesterol, and being easy to digest. However, traditional plant proteins already deliver health benefits at affordable prices, so plant-based meat brands would need a compelling and differentiated "better-for-you" claim to justify premium prices.

Figure 3: Factors when purchasing plant-based meat products



Base: 949 plant-based meat buyers aged 18–45+ who would consider purchasing again or non-plant-based meat buyers who would consider purchasing in the future.
Source: Rakuten Insight/Mintel.

Barriers

Cultural barriers—the association of meat with wealth and health and consumers' greater familiarity with traditional plant proteins (such as tofu)—are key barriers to consuming plant-based meat in China.

Figure 4 shows the perception that plant-based meat is too processed is the number one reason consumers would not buy it. The other main barriers were it not being tasty, being too high in fat and its high price. The media often criticises plant-based meat for being overly processed and having too many preservatives and additives.

Figure 4: Barriers to consuming plant-based meat

Base: 48 plant-based meat consumers or those who haven't consumed plant-based meat in the last six months who would not consider purchasing plant-based meat again. Due to the low number of respondents in this particular group (n=48), we advise caution when interpreting these insights.
Source: Rakuten Insight/Mintel.

> **Chinese consumers are still not fully educated in plant-based meat. Apart from those who, for religious reasons, choose a vegan diet, many consumers are not very familiar with such products. With government advocacy on a healthy diet, carbon neutrality and consumer exposure to these products across many platforms, it is believed that consumer adoption of plant-based meat will gradually increase.**
>
> **Local industry expert**

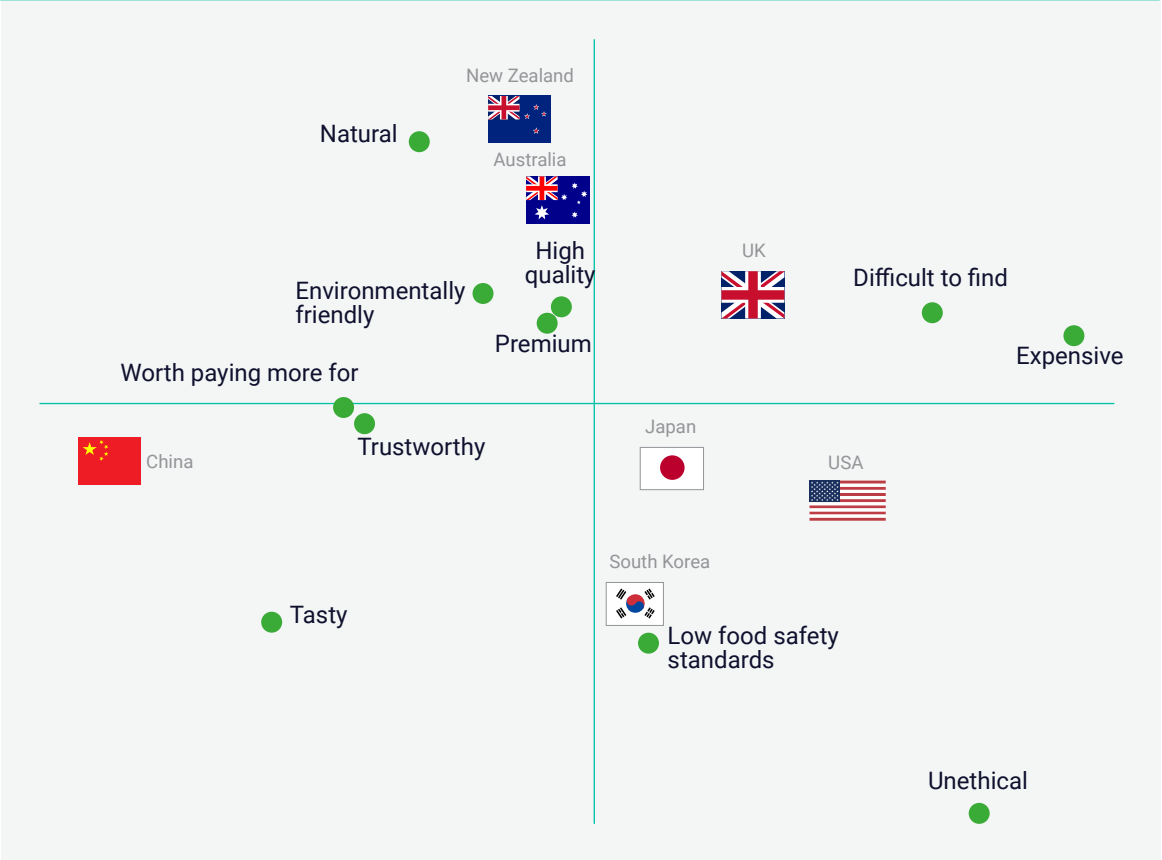
Country of origin preferences

Australian and New Zealand products are perceived as being high-quality and made in line with robust food safety standards in clean and green environments, as Figure 5 shows. These are important attributes, especially when offering alternative proteins compatible with local cuisine,[34] and may help counteract plant-based meats' highly processed image in this market.

The Chinese Government's push for consumers to source locally produced products presents a challenge for exporters to China. Industry interviewees suggest young consumers are not as enthusiastic about international brands as they used to be, especially since COVID-19. For example, Chinese plant-based meat company Starfield has gained noticeable traction, while products from international brands Beyond Meat, Nestlé and Omni are less popular. Some consumers may see domestic products as more trustworthy and worth paying higher prices for. Manufacturing products in China with local partners could help international companies benefit from the positive sentiment towards local production.

The Chinese Government's push for consumers to source locally produced products presents a challenge for exporters to China. Industry interviewees suggest young consumers are not as enthusiastic about international brands as they used to be, especially since COVID-19.

Figure 5: Perceptions of provenance



Correspondence analysis measures the relationship between and within two groups of variables and is used for perception measurement in market research. In this research, country perceptions were measured against the range of attributes represented in Figure 5. It is a statistical visualisation method for picturing the associations between rows (image, attitudes) and columns (brands, products, segments, etc.) of a two-way contingency table.
Base: 1,000 internet users aged 18+.
Source: Rakuten Insight/Mintel.

Place of purchase and frequency

Chinese plant-based meat consumers are multichannel shoppers with 90% of them using both online and instore channels, compared to the 92% of all Chinese consumers—consumers and non-consumers of plant-based meat—who shop at supermarkets and hypermarkets. Sixty-five percent of plant-based meat consumers and 57% of general consumers use convenience stores. Fifty-six percent of plant-based meat consumers and 43% of all consumers shop at natural supermarkets.

Plant-based meat consumers are more likely to use food delivery apps than the general population, which may be due to many foodservice outlets incorporating plant-based meat items and offering delivery options.

Generally, plant-based meat buyers tend to purchase such products two or three times a month. The purchase frequency is particularly higher in convenience plant-based meat products (such as ready meals, snacking and party food, and dumplings); 35% reported purchasing these types of products once per week or more.

For information about plant-based meat, social media is a top source (59%) followed by food and beverage retailers (53%) and traditional media such as television and radio (52%). Plant-based meat consumers in China are more likely to seek information from food and beverage retailers, food and beverage brands, foodservice outlets and even influencers or opinion leaders than from the general population.

Consumer perceptions of cellular agriculture products

At the time of publishing, cultivated meat and products of precision and biomass fermentation were not approved for sale in China. However, over one-third of people surveyed had heard of cultivated meat: 57% were likely to purchase it, and 17% would purchase it once it became available.

Those interested in purchasing cultivated meat ranked health benefits, safety benefits, trying something new, and contributing to food security as motivations for them to buy. Those not interested in consuming cultivated meat products were concerned about the texture, healthiness, their unfamiliarity with products, and the technology used to produce the products.

Thirty-two percent of survey respondents preferred the name ‘clean meat’ (干净肉), 28% preferred ‘cultivated meat’ (培植肉) and 26% preferred ‘cell-cultured meat’ (细胞培养肉).

Awareness of products of precision and biomass fermentation is greater than for cultivated meat: 48% of those surveyed had heard of it. Fifty-nine percent indicated they would likely purchase these products and 21% would purchase them once they became available.

Those surveyed who would be interested in buying products of precision and biomass fermentation ranked health benefits, trying something new, contributing to food security, and safety benefits as motivations for them to buy. Similarly, over half of those surveyed were too unfamiliar with the products to purchase them and were also concerned about taste, healthiness and texture.

Products of precision and biomass fermentation, as well as cultivated meat, are perceived as environmentally friendly, which may be a driver to trial when these products become more widely available.

Fifty-nine percent indicated they would likely purchase these products and 21% would purchase them once they became available.

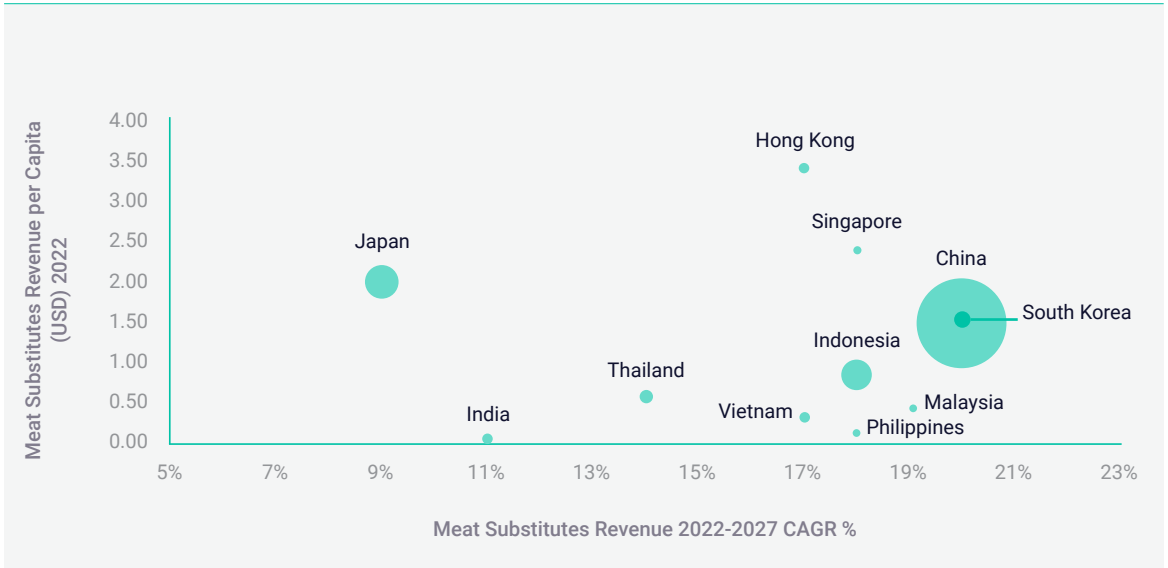
Alternative proteins landscape

Market size

China is Asia's largest meat substitutes market, accounting for 67% of all meat substitute revenue in Asia, with fast growth and high premiumisation projected.

The Chinese meat substitutes market had an estimated revenue of USD2.13 billion in 2022, which equates to USD1.47 per capita. Along with South Korea, China has one of the highest projected compound annual growth rates (CAGR) at 20% between 2022 and 2027, as Figure 11 shows. China's volume of meat substitutes sold in retail was expected to reach 144.9 million kg in 2022, equivalent to 0.1 kg per capita. With a projected 37% CAGR (volume) between 2022 and 2027, volumes could reach 688.5 million kg by 2027.[35]

Figure 6: Meat substitutes market revenue size and growth, by selected Asian markets



Note the size of the bubble represents the total meat substitutes revenue (million USD) in 2022. As defined by Statista, the Meat Substitutes segment covers plant-based meat and mock meat.

Company representation

Table 1, Table 2 and Table 3 show a range of domestic and international alternative protein brands and companies supplying plant-based meat or developing cultivated meat and products produced using precision and biomass fermentation technology in China. As the tables show, domestic and international companies offer localised and Western products, but international companies dominate Western-style products.

Table 1: Domestic plant-based meat brands sold in China, at May 2022

Domestic brands		Plant-based meat products (style and/or format)	Distribution channels
	Be & Cheery/Baicaowei (PepsiCo)	Sausage snack, beef jerky, spicy vegetarian beef	Instore retail Online retail
	Haofood	Chicken nuggets, chops, dice and fingers made with peanut protein	Foodservice Instore retail Online retail
	Herotein	Beef/chicken patties, beef meatballs, beef mince, chicken nuggets, samosas, spring rolls, chilli con carne. Also investing in commercialising hybrid plant-cultivated meat products (plant-based meat with cultivated fat)	Foodservice Instore retail Online retail
	Hey Maet	Chinese-style pork mince, beef patty, sausage, beef mince, beef cube, chicken, nuggets, dumplings	Foodservice
	Jinzi Ham	Ham, sausage	Online retail
	PFI Foods Brand 植爱	Chinese-style pork mince, dumplings	Foodservice Online retail

Domestic brands		Plant-based meat products (style and/or format)	Distribution channels
厨丁造肉 PROTEIN MEAT	Protein Meat	Chicken nuggets, beef patty, mince, beef sauce	Foodservice Instore retail Online retail
STARFIELD 星期零	Starfield	Beef meatballs, beef patty, beef mince, beef pastrami	Foodservice Instore retail Online retail
素莲食品 SULIAN FOOD	SuLian Food	Chinese cuisine alternatives, including pork belly, meat floss, dumplings	Foodservice Online retail
vesta food lab	Vesta	Beef crumbles for Bolognese, luncheon meat, dumplings	Foodservice
许善食品 Whole Perfect food	Whole Perfect Food/Qishan Foods	Chinese-style cuisine, pork, steak, seafood, bacon, sausage, burger	Instore retail Online retail
珍肉	Zhen! (Zhenmeat)	Meatballs, crayfish, pork, dim sum, mooncakes	Foodservice Instore retail
zrou	Zrou	Pork mince, Bolognese lasagne, Singaporean curry rice with meatballs	Foodservice Instore retail Online retail

The above is not a complete list of every available brand.

Table 2: International plant-based meat brands sold in China, at May 2022

International brands		Plant-based meat products (style and/or format)	Brand origin	Production	Distribution channels
	Alpha Foods	Chicken nuggets, sausage	United States	Imported	Foodservice Instore retail
	Beyond Meat	Beef mince, burger, meatballs, sausage, jerky	United States	Domestic	Foodservice Instore retail Online retail
	Deliciou	Beef mince, pork mince, chicken plant mix	Australia	Imported	Online retail
	Harvest Gourmet (Nestlé)	Western and Chinese-style products, including burgers, sausages, kung pao chicken, braised meatballs and pork belly	Switzerland	Domestic	Instore retail Online retail
	Omni (Green Monday)	Pork meat, pork strips, pork luncheon, seafood products	Hong Kong	Imported from Thailand (Chinese factory expected in 2022)	Foodservice Instore retail Online retail
	PlantEver (Cargill)	Chicken nuggets, beef patty, scallop mince, chicken strips	United States	Domestic	Foodservice Instore retail Online retail
	The Vegetarian Butcher (Unilever)	Burger, beef steak, beef slices, meatballs, mince, pork slices, chicken nuggets	Niger	Imported	Foodservice
	Vmeat	Wagyu beef, hot pot, pork and beef balls, pork and beef mince, beef burger, chicken strips	Australia	Domestic	Foodservice
	v2 (v2food)	Dumplings, steamed buns, lasagne, pork rolls, nutritious weight management ready meals	Australia	Domestic	Foodservice

The above table is not a fully comprehensive list of brands.

Cellular agriculture companies

Alternative protein products made using cellular agriculture technology are not yet approved for sale in China.

The cultivated meat industry is nascent but is expected to gain momentum. In January 2022, the Ministry of Agriculture and Rural Affairs released a five-year agricultural plan which points to cultivated meats and other 'future foods' (such as plant-based proteins) as part of its blueprint for food security.[36] The industry's growth and direction will be further enhanced with the release of China's first bioeconomy plan in 2022 as well as by President Xi's public comments about the need to diversify protein across animal, plant, and microorganism sources to bolster food security.[37]

Start-ups in the cultivated meat sector are producing products that cater to local preferences, including pork belly, seafood, fish fillets and sea cucumber (a popular Chinese delicacy).[38] In fermentation, Hong Kong-based biotech start-up New Singularity produces algae-based, mycelium-fermented seafood products.[39]

Table 3 shows the main cultivated meat and precision and biomass fermentation-derived protein companies based in China and their investments. The area of focus shows the stage of the process in which each company is involved, with 'vertically integrated cultivated' representing end-to-end involvement from cell lines to the final product.

Table 3: Cultivated meat and precision and biomass fermentation companies with operations in China, at May 2022

Companies		Location	Area of focus	Approximate disclosed funding (USD)
70/30	70/30 Food Sci & Tech	Shanghai, China	Biomass fermentation of mycelium (products being commercialised)	-
avant	Avant Meats	Hong Kong	Vertically integrated cultivated	3.1 million
蓝佳生物	Blue Canopy	Hong Kong	Biomass fermentation of mycelium, precision fermentation	0.85 million
CellX	CellX	Shanghai, China	Vertically integrated cultivated	15.40 million

Table 3: Cultivated meat and precision and biomass fermentation companies with operations in China, at May 2022

Companies		Location	Area of focus	Approximate disclosed funding (USD)
Demeter BIOTECH	Demeter Biotech	Guangdong, China	Precision fermentation of microalgae	14.5 million
Geb Impact Technology	Geb Impact	Hong Kong	Biomass fermentation of microalgae	0.26 million
JOES FUTURE FOOD	Joes Future Food	Nanjing, China	Vertically integrated cultivated	10.8 million
JSB JOSCIENCES Leading Cell Culture Media Supplier	JSBiosciences	Shanghai, China	Cell-culture media	-
海星	New Singularity	Hong Kong	Biomass fermentation	0.2 million
食朴科技	ProTi Tech	Linhai, Taizhou	Biomass fermentation of microalgae	-
PROTOGA	Protoga Biotech	Guangdong, China	Precision fermentation	1.6 million
SUNP BIOTECH	SunP Biotech	China and United States	3D food printers	4.3 million

Product formats

Interviews with industry experts in China identified that Chinese consumers associate meat with wealth and health, are familiar with traditional plant proteins, and prefer sophisticated Chinese flavours. These present both opportunities and challenges for Australian and New Zealand exporters.

As well as supplying Western-style products (such as burger patties), plant-based meat companies should also adapt their products to Chinese-style cuisines, tastes, and delicacies (such as dumplings and mooncakes). Chinese consumers are also thrifty and will look for low prices and culturally familiar formats like pork belly and mince.

The first new generation plant-based meat products introduced to China in recent years has mostly reflected Western products (such as burger patties, meatballs, and nuggets). However, an increasing number of products tailored to Chinese cooking and taste palates are now being introduced. In 2020, Beyond Meat launched Beyond Pork, its first product made for the Chinese market, considering the country's high rates of pork consumption.[40]

More recent product trends include plant-based versions of commonly consumed local dishes, including kung pao chicken, red braised meat and dim sum, shown in Figure 7.[41] Domestic companies have also been innovating in plant-based meat products that cater to Chinese eating habits while ready meals leverage growing demand for convenience.[42] Plant Plus and Starfield are tapping into the popularity of traditional Chinese snack foods (such as steamed buns, spring rolls and dumplings).[43] There is also innovation in the snacking category with domestic brands Starfield and Whole Perfect Food introducing snacks positioned as healthy and high-protein.[44]

While all product types are popular with Chinese plant-based meat buyers, chilled products are leading with 76% of those buyers purchasing a chilled version in the past six months.

Figure 7: Harvest Gourmet plant-based kung pao chicken and plant-based red braised meat

Health-based marketing

Some brands are offering plant-based meat products with strong health propositions.

For example, Plant Meat Eater, a domestic brand owned by Meikang Food, has launched a range of plant-based meat products that are positioned as a low-calorie light food solution.

The product range, which has soybean and wheat protein as key ingredients, target consumers who are interested in a healthy and active lifestyle. Original Flavour Plant-Based Mince from Plant Meat Eater is described as a light product that provides only 197 calories per 100g serving, and contains zero cholesterol and trans fatty acids, launched in May 2022.

Source: Mintel Global New Products Database.

Price

In China, plant-based meats retail at much higher prices than their conventional meat equivalents, as Table 4 shows.[45] The price premium per 100 g of domestically produced plant-based meat differs greatly across products; it is highest for traditional Chinese snack food (such as dim sum), at 134%, and lowest for mince, at 20%.

Fifty percent of consumers say they are willing to pay the same price for plant-based meat as for their conventional meat and seafood equivalents, but only 31% are willing to pay more. Conventional beef and pork products command higher prices than poultry, and offering alternatives to these meat types could be advantageous for plant-based meat manufacturers.[46]

Table 4: Price comparisons, selected plant-based meat products[47]

Product format	Average price per 100g of imported plant-based meat	Average price per 100g of conventional meat	Price premium for plant-based meat in comparison to conventional meat	Total pack size of plant-based meat
Chicken-style, crumbed	USD1.53	USD0.81	**89%**	210–450g
Sausages	USD2.53	USD1.76	**44%**	150–280g
Burger	USD3.06	USD1.95	**57%**	150–452g
Mince	USD2.48	USD2.07	**20%**	227–500g
Traditional Chinese snack food	USD2.90	USD1.24	**134%**	168–345g

Source: Mintel Global New Products Database.

Partnerships

Multinational companies have collaborated to launch plant-based versions of popular products in China.

For example, Unilever introduced the Vegetarian Butcher to China in December 2020 and collaborated with Burger King to launch a plant-based 'Whopper' in several cities, including Beijing, Shanghai, Guangzhou and Shenzhen.[48] However, with both companies being foreign, they experienced local logistical difficulties and cultural dining differences, making it hard to localise and lower costs. Partnering with a local company could help overcome such issues, as demonstrated by collaborations like the one between Starfield, Naixue and HeyTea to launch plant-based burgers.

Partnerships between international and local companies can create opportunities across both Western and local cuisines. For example, in 2020, Starbucks collaborated with Beyond Meat and Omni to introduce a line of plant-based menu items. More recently, Australian company v2food signed a partnership with Shuhui, one of China's largest steam bun manufacturers, to locally produce a range of plant-based meat products, including dumplings, steamed buns, and pork-style rolls.[49] In early 2021, Beyond Meat partnered with Beijing's formal dining restaurant chain Jin Ding Xuan to release eight new menu items featuring the brand's plant-based meat prepared in a distinctive style to suit consumers' tastes. This included Steamed Meat Cake with salted egg yolk, Yibin Burning noodles and Beyond Meat Mala spicy hot pot, shown in Figure 8.

Figure 8: Beyond Meat and Jin Ding Xuan products

Top: Beyond Meat Mala Spicy Hot Pot (Beyond Meat 麻辣香锅), released by Jin Ding Xuan, highlights that 'the temptation of spicy food can't be stopped'.
Bottom: Steamed Plant-Based Meat Cake With Salted Egg Yolk is a traditional Cantonese dish.
Source: Jin Ding Xuan.

Manufacturing and sourcing

Disruption to global supply chains, increased transport costs and protectionist policies have resulted in plant-based meat companies preferencing locally produced raw materials.

Interviews with stakeholders show that these issues have also resulted in large plant-based meat companies (such as Beyond Meat, Nestlé and v2food) either setting up manufacturing plants in China or investing in third-party co-manufacturing.

Despite the consumer trend of preferencing domestic products and manufacturing, China remains reliant on imported and domestic ingredients. Soy and pea are popular plant protein sources, and in 2020 China produced over 19 million tonnes of raw soybeans, nearly 18 million tonnes of green beans and 11 million tonnes of green peas.[50] To meet demand in 2021–22, China imported 94 million tonnes of soybeans, representing 84% of total domestic consumption.[51]

There are major manufacturing facilities in Anhui and Hubei provinces and factories in Fujian and Guangdong provinces in the south. Industry experts believe these locations are due to favourable local policies. Given China's large geographical size, manufacturers should consider transportation and market accessibility when deciding on manufacturing locations. Many multinational food companies are establishing plant-based meat manufacturing plants in China. Cargill is producing its PlantEver products in Chuzhou,[52] Nestlé invested in a facility in Tianjin,[53] Beyond Meat has a manufacturing facility in Shanghai,[54] and Impossible Foods is reportedly awaiting regulatory approval to expand into China.[55]

Ingredients

Soy is the most popular plant-based protein ingredient used in China, followed by pea, rice and wheat gluten. Other plant ingredients, including mushrooms, other fungi, algae and konjac, are also used. Historically, China has not permitted genetically modified (GM) crops to be planted domestically.[56] However, this is changing.

In 2022, the Chinese Government approved three GM soybean varieties and issued new certification standards for GM soybean crops to improve domestic food security.[57] Imported GM soybeans are mainly used for crushing and livestock feed, while domestically produced soybeans tend to be used for direct human consumption.[58]

China has a history of producing mock meats, including dry texture or textured vegetable protein (TVP) products. These low moisture extrusion (LME) facilities are suitable for producing ingredients for plant-based meat products, such as small, fibrous pieces or chunks, and are widely distributed across China, including in Henan and Zhejiang provinces.

There is a preference for LME technology in China as the process costs less than high moisture extrusion (HME). Large Chinese retailers (such as Tmall) have reported lower-than-expected sales of HME plant-based meats, and industry sources note that in some HME products, the outside layer has more flavour than the whole product. Despite this, many companies, including Nestlé, are investing in HME in China, which may lead to improved quality and lower production costs.

Investment

China's growing plant-based meat industry has seen significant investment domestically. In 2022, local alternative protein start-ups collectively raised USD152 million.[59]

Venture capital is driving growth through investment in China's plant-based, cultivated meat and precision fermentation companies. For example, the Lever China Alternative Protein Fund is a joint investment fund and accelerator program co-launched in 2021 by Lever VC and Brinc to invest RMB40 million over the next four years.[60] More recently, start-up Starfield stood out as the country's fastest-growing and most financed plant-based meat operation, having raised USD100 million in a Series B funding round in January 2022.[61]

In August 2022, cultivated seafood start-up Avant raised USD10.8 million in a Series A funding round to scale up production of patent-pending technology for commercialisation by late 2023.[62] Cultivated pork start-up Joes Future Food raised almost USD11 million towards cultivated pork production.

There are also instances of Australian and New Zealand companies leveraging international capital for expansion into China. For example, Australian plant-based meat company v2food secured USD72 million in a Series B round in 2021 with multiple international backers. It intends to use these funds to accelerate its penetration of the Chinese market.

Support has also come from the Chinese Government. In 2020, the Ministry of Science and Technology launched the national research and development program, Green Biological Manufacturing, with an estimated RMB20 million dedicated to plant-based and cultivated meat projects. In 2021, the Chinese Government launched the High-Efficiency Biological Manufacturing Technology of Artificial Meat multi-year project. Jiangnan University, which has one of China's leading agricultural science programs, leads the program.[63]

Interviews with industry experts indicated that while plant-based meat has attracted capital investment in recent years, many start-ups have launched products that were not fully developed, leading to negative consumer experiences and perceptions of the products. They saw this as especially true for younger Chinese. This could be addressed by developing products that meet localised taste and mouthfeel expectations.

Regulatory and trade overview

China is a complex, challenging market with an often uncertain regulatory environment.[64]

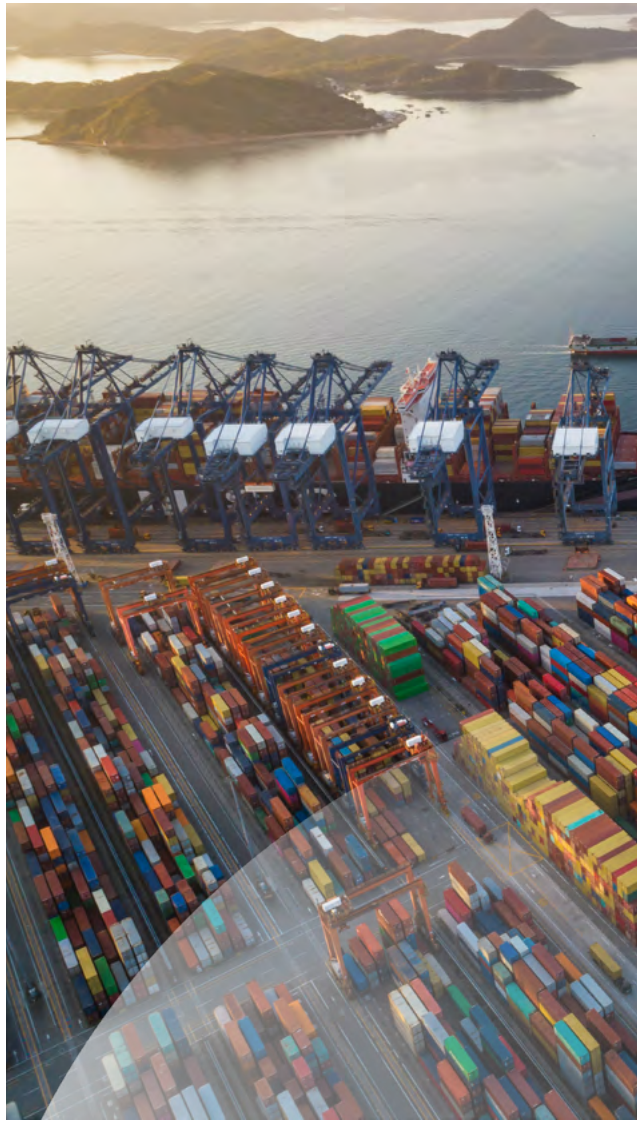
Austrade, Australia's Trade and Investment Commission, advises that investing time and resources to understand the market is essential to build the right in-country networks. It also advises engaging local Chinese staff or China-based partners to provide on-the-ground insight and representation.

Typical of complex food supply chains, China has many distribution channels that are often fragmented and do not have nationwide coverage, with limitations particularly in cold chain infrastructure for storage and transport. Navigating distribution channels and regulatory requirements can be time-consuming as exporters must go through various intermediaries, including import agents, wholesalers, distributors, and sub-distributors. Import requirements can only be satisfied by licensed importers that provide import clearance services for third-party distributors. This makes it important to select partners carefully that operate in the required geographic location and also take a multiparty approach that covers both online and offline channels that must often be navigated.[65]

Food and beverage products imported into China must be approved before export and/or inspected at the border by the China Entry-Exit Inspection and Quarantine Bureau (AQSIQ or CIQ). In April 2021, China Customs (GACC) announced that from 1 January 2022, all foreign food manufacturers, processors and storage facilities must be registered with GACC to export to China.[66]

Trade agreements

The China-Australia Free Trade Agreement (ChAFTA) allows most Australian processed foods an import duty advantage of up to 25% over imports from other countries. Retail food sales in this market incur a value-added tax (VAT) of 13–17%. China's Ministry of Finance, from time to time, declares provisional reductions to the most-favoured-nation tariffs. Specific types of shelf-stable food products can be sold straight to consumers duty-free via cross-border e-commerce, with a VAT of 11.9%.[67] New Zealand exporters have tariff-free access to over 97% of exported goods under the New Zealand-China Free Trade Agreement (NZ-China FTA).[68]



Definitions and classifications

Table 5: Regulatory definitions and classifications

Foodstuff/ingredient	Regulation	Definition
Meat analogues or substitutes	Draft recommended national food safety Standard Terminology and Classification of Veggie Meat Analogues issued in 2021	Foodstuffs obtained from plant protein (e.g. soybean proteins, cereal proteins, oilseed proteins and algal proteins) or microbial proteins (e.g. fungal protein) as main raw materials, with or without supplementary ingredients, additives and fortificants, bearing similar appearance, texture, nutritional value, flavour, taste and colour of meat products. There are also definitions laid down for 'vegan meat analogues' and 'non-vegan meat analogues', different types of meat analogues based on, for example, different manufacturing processes (frozen prepared, stewed, smoked, barbequed, fried).
Plant-based meat and meat products	Voluntary group standard T/CIFST 001-2020 Plant-Based Meat Product	Foodstuffs obtained from raw materials of plant origin (e.g. soybean, cereal grains, as well as algae and fungi) or the products thereof as the sources of protein and fats, with or without supplementary ingredients, additives including fortificants, bearing similar texture, flavour, taste and appearance of meat and meat products from livestock, poultry or seafood.
Cultivated meat and precision fermentation-derived products	No specific legislation about definitions	Novel food definitions apply.

Table 6: Permissibility of standard foods and alternative proteins

	Permissibility
Fungal proteins	The draft standard for terminology and group standard T/CIFST 001-2020 states that fungal proteins and ingredients derived from fungi generically are considered permitted ingredients. Terminology and classification of veggie meat analogues issued by the technical committee for the draft standard mentions and recognises the products by the companies Quorn and Mycorena. It is understood that mycoprotein belonging to fungal proteins would be permitted for use as a normal bulk ingredient in plant-based meat alternative products with no restrictions (such as limits of use). Mycoprotein is not considered a novel food, provided the fungi involved are conventional. If there are any GM microorganisms, GM regulations would be applicable.

	Permissibility
Cultivated meat	No specific provisions in the legislation to address cultivated meat obtained through cell-culture technology. Given the techniques used are non-conventional from a food manufacturing point of view, cultivated meat will be subject to novel legislation and requires pre-market novel approval at present.

Table 7: Labelling and naming regulations

Product name	Regulation
Plant-based food	The T/CIFST 002-2021 General Principle for Plant-Based Foods recommends that the words 'plant', 'plant-based', 'plant protein', 'plant-derived' or the specific name of the plant raw material or its source used should be included in product naming. The name should reflect the true nature of the product. Alternatively, the words 'plant-based', 'plant-derived' or other descriptive terms may be declared on the same display panel with the product name. When using plant-based food as raw material to produce other foodstuffs, it should be indicated to consumers that the raw material concerned is of plant origin, recommended on the same display panel with the product name.
Plant-based meat	The T/CIFST 001-2020 Plant-Based Meat Products states that the product category name should be clearly declared in conjunction with or near the product name. Descriptive words indicating that the ingredients are from plant origin or mimic meat products should be used together with the product name, for example: • to use descriptive words including the word 'plant': plant-beef, plant-based beef, plant-derived beef, plant protein beef or plant-made beef • to add the word 'plant' or equivalent in front of the product name for the conventional meat-based equivalents: plant hamburger, plant sausages, plant ham, plant steak, plant meatballs, plant bacon, etc. The words (such as 'plant-derived' and 'non-animal-derived') may be used to describe the source of raw materials in the final product. In addition, the word 'veggie' can also be used. If the differences in the font size or colour are likely to mislead consumers as to the true nature of the product, the same font size and colours should be used for the product name and category name. The following should be included in labelling: • indications of whether the product is raw/uncooked or cooked • instructions of use • the word indicating this product is different from the meat product. The Administrative Regulation for the Supervision and Inspection of Food Labelling prescribes that for analogue or substitute type of products, the designation of the product should be preceded by the words 'synthesised', 'analogue' or 'veggie' in Chinese and, in addition, the name of the applicable product category that indicates the true nature of the food should be declared.

Table 8: Labelling and naming regulations

Product name	Regulation
As ingredients	The GB 77182011 General Standard for the Labelling of Pre-packaged Foods mandates that an ingredient listing is subject to the ingredient declaration requirements. The T/CIFST 002-2021 and T/CIFST 001-2020 labelling principles mean that the words 'plant', 'plant-based', 'plant protein', 'plant-derived' or the specific name of the raw plant material or its source should be included in the ingredient designation. The Administrative Regulation for the Supervision and Inspection of Food Labelling requires an alternative ingredient should be preceded by the words 'synthesised', 'analogue' or 'veggie' in Chinese in the ingredients listing.

Table 9: Claims regulations

	Regulation
Nutritional	National Food Safety Standard GB 28050-2011 Standard for Nutrition Labelling of Pre-packaged Foods (USDA translations).[69] The label of foods for normal consumption and foods for special dietary uses may only carry permitted nutrition claims as prescribed in GB 28050-2011 (but not health claims). A second draft of the new GB 28050 was released in 2021 but is not yet finalised or in force.
Health	Health claims are regulated as 'Health Food functionality claims', which are only permitted on the label of health foods. Health food refers to food products that claim to provide certain health benefits as well as supplement vitamins and minerals. They fulfil the nutritional requirements of certain categories of persons and provide specific and beneficial physiological effects on health but are not intended for the treatment of disease. They must not have any immediate and/or short-term and/or long-term adverse effects on health. Health foods are subject to pre-market authorisation or notification procedures, depending on the formulation and other factors. All the ingredients and labelling information (including functional claims) will be examined and assessed by the authority. The government will ultimately determine if the health claims are acceptable for the health food concerned on a case-by-case basis.
Marketing	National Food Safety Standard GB 7718-2011 General Standard for the Labelling of Pre-packaged Foods. GB 7718 requires labelling information to be truthful and not misleading. There are no specific provisions on marketing claims other than such claims should be truthful and not misleading or deceptive or likely to create an erroneous impression regarding its value, merit or safety.

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Singapore

Summary

Singapore has one of the most business-friendly and competitive economies in the world. With a 90% dependency on food imports along with a progressive regulatory framework and government incentives, Singapore is ranked number two globally by the World Bank for ease of doing business (the highest amongst the five countries included in this report) and is considered the alternative protein hub in Asia.

Singapore has an established regulatory framework for assessing novel foods including cultivated meat, and is the first jurisdiction in the world to approve a cultivated meat product for commercial sale; GOOD Meat's cultivated chicken.

Singapore and Australian diplomatic and trade relations are strong and vibrant,[1] most recently showcased through the landmark signing of the first-of-its-kind Green Economy Agreement (GEA) in October 2022. Under the GEA both nations will jointly implement 17 practical initiatives, including sustainable agriculture and food systems.[2] Similarly, the bilateral relationship between Singapore and New Zealand is close and longstanding.[3]

Singapore is an attractive destination for exporters of both finished goods and research and development of products made from plants, cell cultivation and precision and biomass fermentation. A thriving food culture with a wide variety of culinary options from across Southeast Asia, China, and the West, provides exporters with a range of pathways to supply their existing offerings or develop localised products.

Due to consumer interest in flexitarianism, conscious consumption, and health, Singapore is the second most favourable market for plant-based meats in Asia, with the highest meat substitutes revenue per capita. Singapore's volume of meat substitutes sold in retail reached 1.2 million kg in 2022, an equivalent consumption of 0.2 kg per capita. With an 18% CAGR between 2022 and 2027, volumes are projected to reach 2.7 million kg by 2027.

Due to consumer interest in flexitarianism, conscious consumption and health, Singapore is the second most favourable market for plant-based meats in Asia, with the highest meat substitutes revenue per capita.

Market landscape

Socioeconomic and cultural factors

Singapore is a city-state with a GDP of USD397 billion.[4] Singapore also has one of the world's highest economic growth rates averaging 7.7% since its independence in 1965. While this growth was driven by manufacturing, today it also includes the services sector as the other primary economic pillar.[5] Despite the impact of COVID-19, Singapore's rebound has outpaced similar economies and experienced growth, with businesses and expatriates exiting Hong Kong and relocating to Singapore.[6]

Singapore has well-developed infrastructure and ranks fifth in the World Bank International Logistics Performance Index. Singapore and Japan are the only two Asian countries to feature in the global top 10. With a score of four out of five, Singapore has demonstrated efficiency in clearance processes, transport infrastructure, and timeliness of shipments reaching their destination.[7]

.As an island nation, Singapore relies heavily on imported agrifood products, with more than 90% of its food coming from over 170 foreign countries, taking advantage of its connectivity and tariff-free trading environment.[8] Singapore's agricultural and related product imports totalled USD17.2 billion in 2021, of which Australia had a 7% share.

Its multi-billion-dollar food industry is bolstered by certain population groups, with high disposable incomes driving demand for premium products, as well as by concentrated urbanisation. However, there are significant market segments with lower incomes that are price conscious. Singapore is also seen as a trendsetter nation within Asia across many industries, including food and beverages, which makes it a favourable location to launch new concepts[9] and road test new products in a multicultural society across a wide variety of ethnic groups. The nation was the first jurisdiction in the world to approve the sale of a cultivated meat product in late 2020, approving GOOD Meat's cultivated chicken setting new standards for food systems.

In line with most Asian markets, consumption of traditional plant proteins (like tofu) in Singapore is well-established: for many years it has been a staple protein source for vegetarian consumers, many of whom are Buddhist (31.1%) or Hindu (5%). However, interest in sustainable and ethical consumption and the growth of flexitarian diets is driving renewed interest in plant-based alternatives.[10]

The island's large expatriate population has a major influence on Singaporeans' exposure to Western cuisines.[11] Singaporeans tend to be open to new food concepts, meaning that plant-based meat products and cultivated meats can encourage consumption by offering formats catering to both local Singaporean dishes and Western cuisines.

Retail and foodservice landscape

Singapore's population of locals, expatriates and migrant communities has resulted in a range of dining options to suit varying budgets and preferences.

Singaporeans mostly dine out, with as little as 22% cooking at home daily.[12] The country is famous for its culture of hawker centres—outdoor dining food courts—that offer a wide variety of culinary options, including Chinese, Indian, Malay, and Indonesian cuisine, at low prices. People from all walks of life visit hawker centres, which merge the public and private lives of families and foster a sense of community.[13] Beyond the hawker centres, Singapore also has mid-range and fine dining options, including Michelin-starred restaurants.[14]

The foodservice industry is diverse and competitive: on average, Singapore has one of Asia's highest dining-out spending rates each month. Singapore's foodservice sector offers a wide range of Asian and Western flavours in outlets extending from hawker centres to international franchise dining chains and full-service restaurants. Driven by COVID-19, the sector has shifted towards digitalisation and food deliveries via apps (such as Deliveroo, GrabFood and foodpanda). These delivery services utilise centralised kitchens and have penetrated traditional hawker centres.[15]

Singaporeans purchase food through a diverse range of online and instore channels. There are supermarkets (for example, Fairprice NTUC and Cold Storage), including options with 'wet/dry' market experiences, along with independent specialty retail stores (for example, Little Farms) and smaller grocery and convenience stores selling premium natural food products. These stores have experienced high growth supported by higher-income consumers and expatriates in upmarket residential areas.

Convenience stores face intensive competition and look for ways to cut costs through the adoption of technology-enabled unmanned stores.[16] Online grocery stores (such as Shopee and Lazada) are popular among time-poor consumers seeking convenience and speed. The Mustafa Centre in Little India, which imports from multiple countries, is popular with migrant workers and tourists, as are Japanese retail stores. Meal subscription services (such as Insane Meals) target flexitarians with ready meals incorporating local and international plant-based meat brands.[17]

> **In my opinion the plant-based shift will have to happen. In addition to health, diet and environmental aspects, there is also the food security issue. I believe this will be a key driver. Once texture, taste and price parity come into play in the coming years, there is no choice but to go in this direction and the industry will take off. Advanced economies such as Singapore and South Korea will lead and the rest of the region will follow. Thailand will follow closely behind. Indonesia will have to follow because they have nearly 300 million people to feed and they have a rising middle class with growing purchase power.**
>
> **Stephane Sene**
> Human Nutrition Regional Manager SEA & Oceania, Buhler Asia

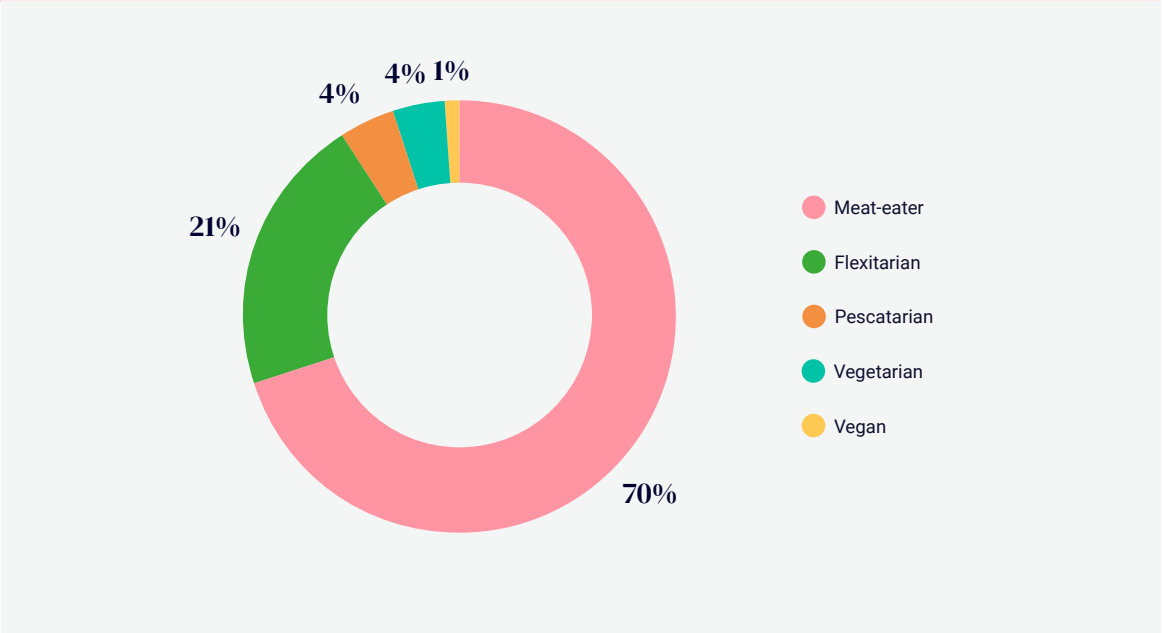
Consumers

Dietary preferences

In Singapore, 70% of consumers describe their dietary preference as meat-eater, while one in five identify themselves as flexitarian. Consumers who claim to follow a flexitarian diet are significantly higher among those aged 25–34 (27%) and amongst those who have children in the household (27%). Pescatarians, vegetarians and vegans are the minority, with pescatarians representing just 4%, while vegetarians and vegans combined represent 5% of the population, as Figure 1 shows.

Nearly a quarter (24%) of Singaporeans plan to consume less red meat in the next six months, 15% plan to reduce poultry and 11% plan to reduce fish/seafood. Consumers who plan to consume less red meat and poultry are significantly higher among flexitarians when compared to meat eaters.

Figure 1: Dietary preferences



Base: 1,000 internet users aged 18-45+
Source: Rakuten Insight/Mintel.
Meat-eaters eat red meat or poultry.
Flexitarians eat plant-based options at some meals, replacing red meat, poultry, fish/seafood, eggs or dairy.
Pescatarians eat no red meat or poultry but eat fish/seafood, dairy and eggs.
Vegetarians eat no red meat/poultry or fish/seafood but eat dairy and eggs.
Vegans eat no animal products.

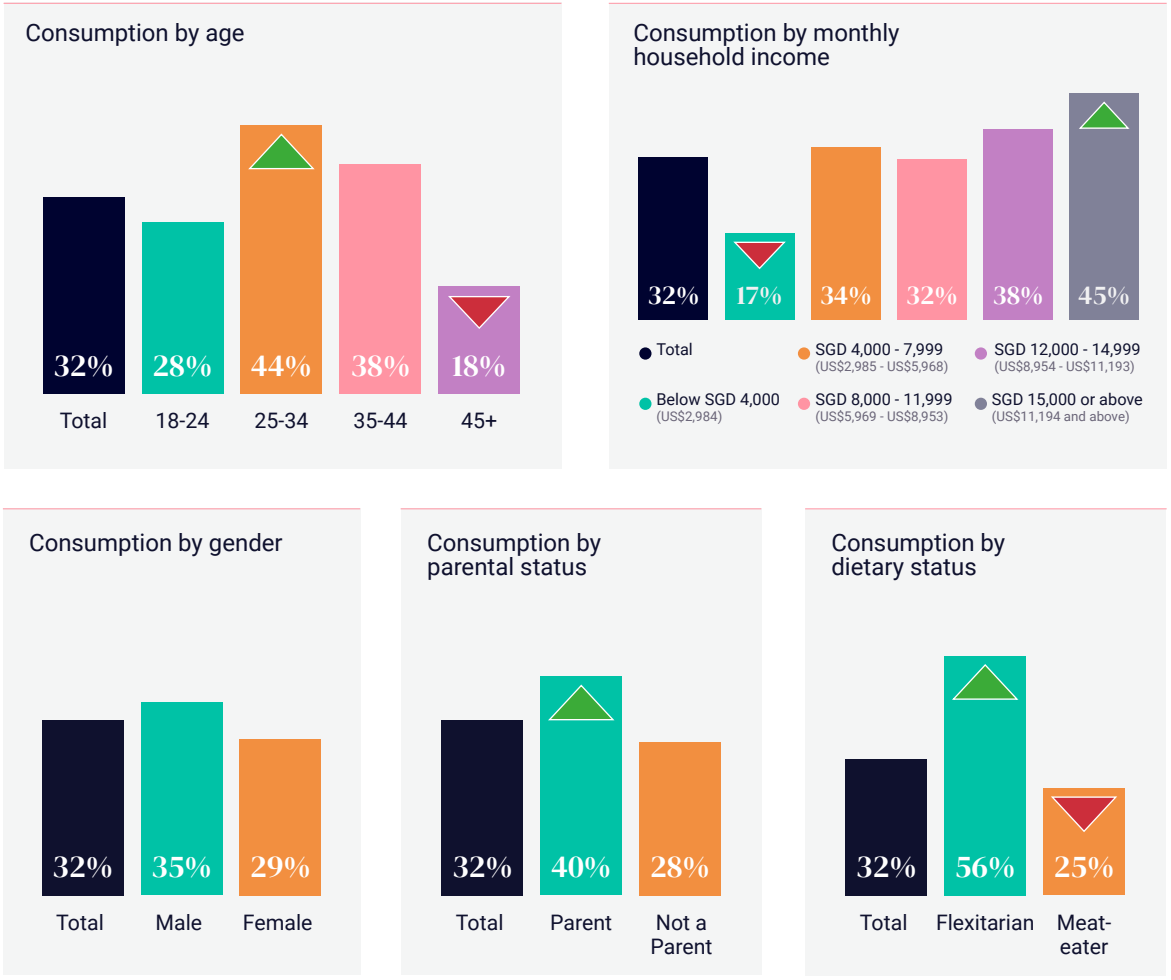
Plant-based meat consumption

One-third (32%) of Singaporeans have eaten plant-based meat in the past six months. Consumption of plant-based meat was significantly higher among 25–34-year-olds (44%) and significantly lower among 45+-year-olds (18%).

The series of charts right show this overall 32% and a detailed breakdown of each segment measured. Differences across age, gender, income, parental status, and dietary preference are evident. For example, of the 32% of the overall population indicating consumption of plant-based meat, in the 25–34-year-old bracket, 44% of consumers surveyed have purchased plant-based meat.

Plant-based meat consumers in Singapore are more likely to have a monthly income of more than SGD15,000 (approximately USD11,244) and above. As Figure 2 shows, plant-based meats appeal to people who are younger, wealthier and who are parents.

Figure 2: Plant-based meat purchase and consumption, by demographic



Base: 1,000 internet users aged 18-45; 950 internet users aged 18-45+ who shop for groceries in the household.
Source: Rakuten Insight/Mintel.

▲ Significantly higher than total at 95% confidence interval. ▼ Significantly lower than total at 95% confidence interval.

Drivers

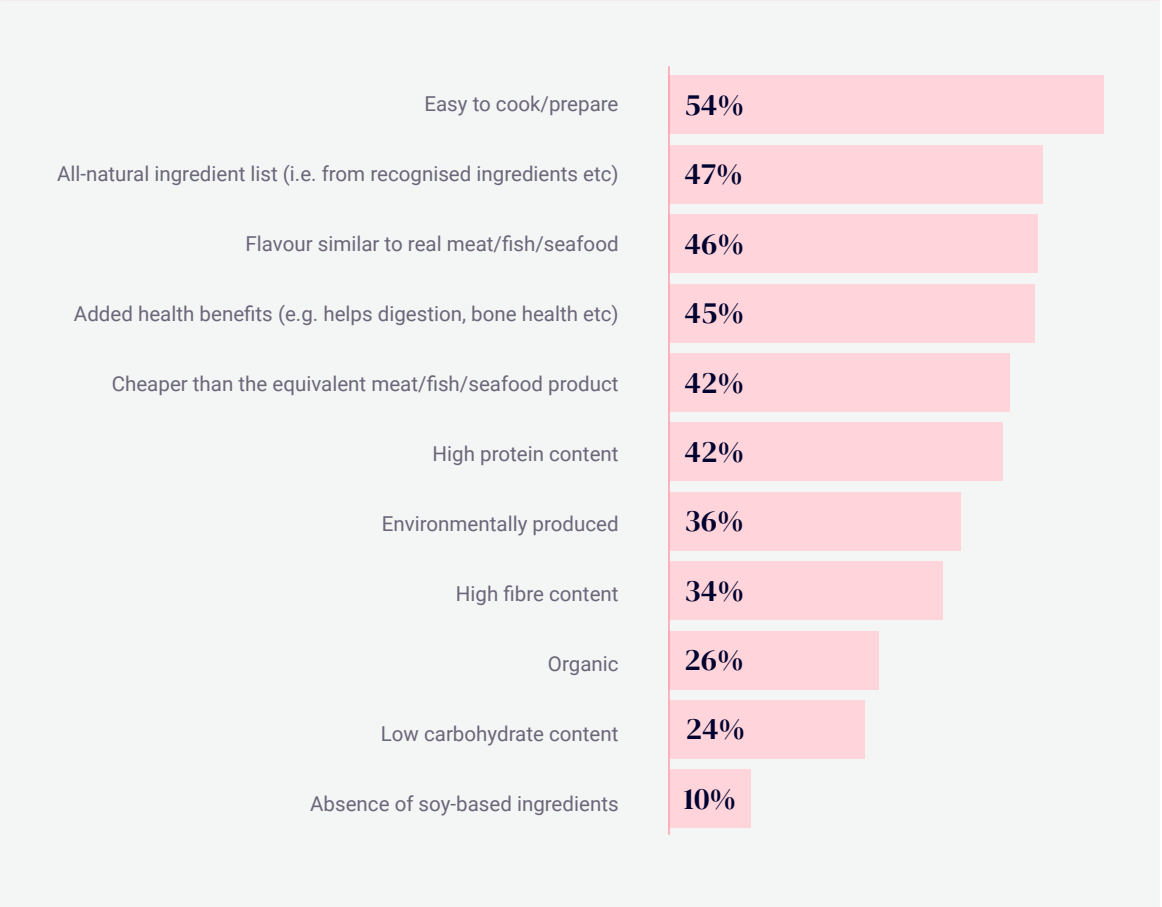
Environmental and health concerns are driving plant-based meat consumption in Singapore, while price is the biggest barrier for higher adoption.

Thirty percent of plant-based meat consumers in Singapore plan to consume more plant-based meat products in the next six months, and 60% plan to consume the same amount.

The top reasons driving consumption of plant-based meats are improving environmental concerns (45%), improving overall health (43%), reducing consumption of red meat/poultry/fish/seafood (42%), liking the taste (41%), adding more variety of proteins to their diet (30%), and safety concerns including avoiding animal-borne diseases (30%).

For consumers of plant-based meat in Singapore, the top five factors determining purchasing decisions are ease of preparation 54%), natural ingredient list (47%), flavour similarity to conventional meats (46%), added health benefits (45%), and being less expensive than the conventional meat equivalent (42%), as Figure 3 shows. Data suggests that companies can reach nine in ten consumers by combining easy to cook, natural ingredients and added health benefits, while offering more value than conventional meat.

Figure 3: Factors when purchasing plant-based meat products



Base: 774 plant-based meat buyers aged 18-45+ who would consider purchasing again and non-plant-based meat buyers who would consider purchasing in the future.
Source: Rakuten Insight/Mintel.

Barriers

Price is the number one barrier for the first or repeat purchases of plant-based meat, as Figure 4 shows. Industry experts suggest that while Singapore is seen as a wealthy country, consumers expect high-quality food to be consistently available at affordable prices, and the reputation of its famous hawker centres is a source of national pride.

In Singapore, plant-based meat products are generally more expensive than conventional meat equivalents (see Table 4 later in this chapter for price comparisons). The second barrier to first or repeat purchase is the perception that plant-based meat is too processed. This suggests that price premium and perception of over-processing are the biggest challenges for category growth and that brands could address some of these barriers by speaking to the two top drivers: ease of preparation and natural health messaging.

In-depth interviews were conducted with industry experts from retail, foodservice and manufacturing companies operating in Singapore. They indicated that for consumers to look past price differences they need to be motivated by their personal health (such as cholesterol/saturated fats), by concerns around hormones or diseases from animal-derived products, or by environmental concerns. Most (60%) consumers who buy plant-based meat expect at least price parity with conventional meat equivalents and around one-quarter (23%) of consumers surveyed indicated they would only buy plant-based meat if it was cheaper.

For the significant market segments with lower disposable incomes than those in expatriate or wealthier communities, reducing prices where possible will allow for wider adoption of plant-based meats.

Regardless, mass market appeal will depend on prices falling below conventional meat. This is confirmed by survey respondents, with 37% saying the rising cost of meat, poultry, fish, and seafood as the key reason for future plant-based meat consumption.

Figure 4: Barriers to consuming plant-based meat

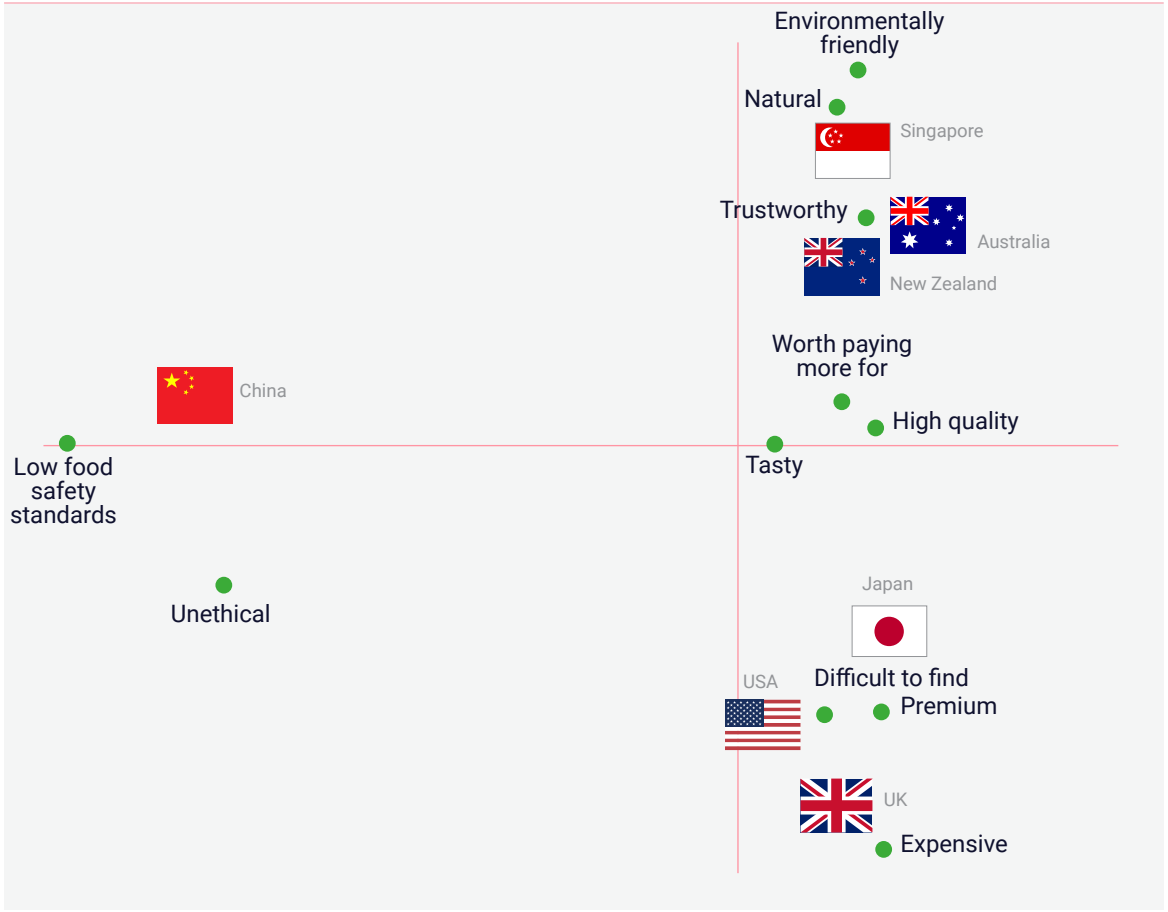
Base: 200 plant-based meat consumers aged 18–45 who would not consider consuming again or non-plant-based meat consumers who would not consider consuming the product in the future.
Source: Rakuten Insight/Mintel.

Country of origin preferences

Australian and New Zealand products are perceived as trustworthy and natural among Singaporeans.

Products from Japan, the United States and the United Kingdom are perceived as premium. However, they are considered difficult to find and expensive. Chinese products are perceived as having low safety standards, as Figure 5 shows.

Figure 5: Perceptions of provenance



Correspondence analysis measures the relationship between and within two groups of variables and is used for perception measurement in market research. In this research, country perceptions were measured against the range of attributes represented in Figure 18. It is a statistical visualisation method for picturing the associations between rows (image, attitudes) and columns (brands, products, segments, etc.) of a two-way contingency table.
Base: 1,000 internet users aged 18+.
Source: Rakuten Insight/Mintel.

Place of purchase and frequency

Supermarkets are the most common channel, used by more than 90% of all consumers for their grocery shopping, followed by wet/traditional markets.

Supermarkets are the most common channel, used by more than 90% of all consumers for their grocery shopping, followed by wet/traditional markets. After these two major channels, plant-based meat consumers are also more likely to shop both at convenience stores and natural supermarkets, with 34% reporting doing so, suggesting a higher preference for convenience and natural products than that of general consumers (21% at convenience stores and 18% at natural supermarkets). Plant-based meat consumers are more likely to use online retailers (63%) and food delivery apps (48%) than general consumers (51% and 31% respectively).

The majority of plant-based meat consumers purchase these products monthly. Over 60% of plant-based meat consumers say they have purchased the products at least two to three times a month in the last six months. The purchase frequency is particularly higher in crumbed-style products, with 38% reporting to have purchased this type of product once a week or more.

Plant-based meat products are usually consumed during main meals, with lunch and dinner being the most popular occasions. Plant-based meats have lower penetration in brunch, breakfast and snacking occasions.

Sixty-one percent of plant-based meat consumers and those who would consider consuming plant-based meat claim they consume/would consume a plant-based meat product as a main dish, while 56% mention they consume/would consume the product as a side dish. Most plant-based meat consumers (61%) consume a plant-based meat product in a meal, typically including meat/fish/seafood on a weekly basis (up to six times a week), reflecting that many consumers occasionally replace conventional meat with plant-based meat products instead of strictly limiting themselves to plant-based meat. Seven percent of plant-based meat consumers report eating plant-based meat daily.

When looking for information about plant-based meat, social media is a top learning source, followed by food and beverage retailers, government websites and media outlets.

Seven percent of plant-based meat consumers report eating plant-based meat daily.

Consumer perceptions of cellular agriculture

Compared to other Asian markets, Singapore has the highest awareness of cultivated meat, with 53% of consumers saying they have heard of it.

As aforementioned, Singapore has an established regulatory framework for novel foods and is currently the only country in Asia with commercial sales of cultivated meat; a cultivated chicken product from GOOD Meat. Singapore already has precision fermentation dairy products on sale from Perfect Day, and recently gave approval for sale to another precision fermentation company, Remilk.

Singapore is in the middle of the five countries surveyed when it comes to cultivated meat acceptance. Six percent of consumers indicate they will definitely purchase cultivated meat once it becomes more widely available and a further 33% say they are likely to purchase cultivated meat once it becomes more widely available. The top drivers for consumption of cultivated meat include environmental concerns (51%), health benefits (43%), better for animals (43%) and contributing to food security (42%). Consumers who are hesitant to buy cite their high price expectation of cultivated meat (48%), as well as unfamiliarity (46%) and unnatural (45%) perceptions, as key concerns.

Consumer awareness of precision and biomass fermentation is lower, with 28% of Singaporean consumers saying they have heard of these technologies. Seven percent of consumers indicate they will definitely purchase products of precision and biomass fermentation, with a further 27% saying they are likely to purchase them. The top drivers for consumption of precision and biomass fermentation products include health benefits (48%), environmental concerns (47%), to try something new (41%) and to contribute to food security (39%). Consumers who are hesitant to buy cite unfamiliarity (53%), expected high price (44%), and concerns over taste (40%) as the key barriers to purchase.

For both cultivated meat and products of precision and biomass fermentation, it appears manufacturers will need to address the taste perception of these products—'tasty' ranked last as an associated attribute. Cultivated meat and products of precision fermentation are otherwise perceived as environmentally friendly by consumers in this market, which can be promoted as a key benefit to encourage trial wider retail consumption.

Alternative proteins landscape

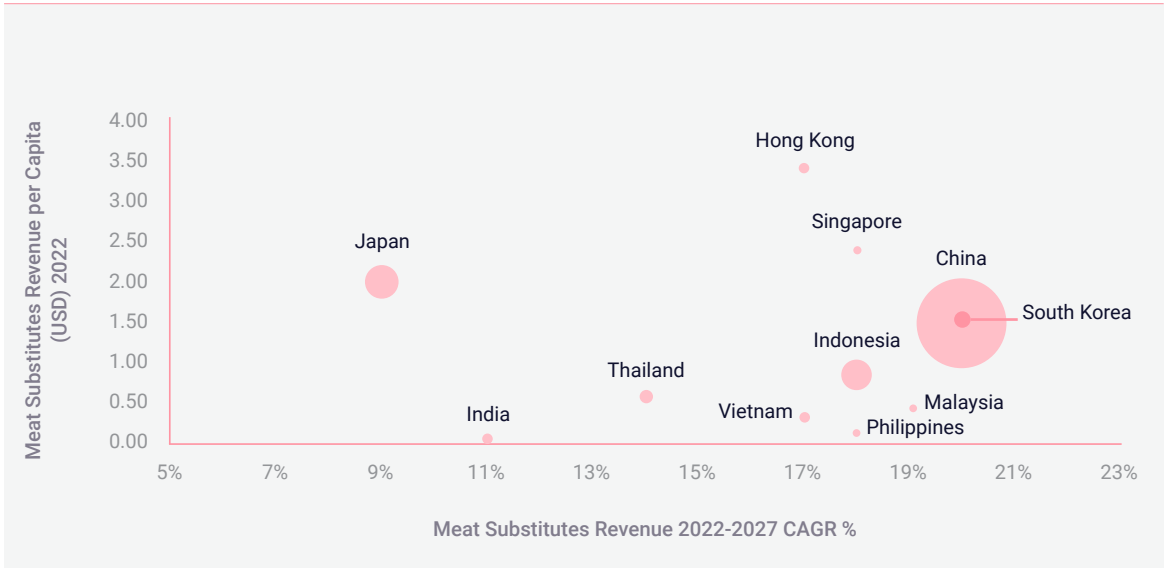
Market size

Singapore's meat substitutes market reached USD13.91 million in 2022 and has a projected growth rate aligned with other markets in the region of 18% CAGR between 2022 and 2027.

It had the highest revenue per capita (USD2.34) in the region after Hong Kong, and the ratio of revenue against volume for meat substitutes in 2022 was USD12.

These relatively high ratios compared to other markets in the region indicate some opportunity for premiumisation in Singapore, however, consumer intelligence indicates the market is very price-sensitive regarding future and repeat purchases of plant-based meat. Singapore's volume of meat substitutes sold in retail reached 1.2 million kg in 2022, an equivalent consumption rate of 0.2 kg per capita. With an 18% CAGR between 2022 and 2027, volumes are projected to reach 2.7 million kg by 2027.[18]

Figure 6: Meat substitutes market revenue size and growth, by selected Asian markets



Note the size of the bubble represents the total meat substitutes revenue (million USD) in 2022. As defined by Statista, the Meat Substitutes segment covers plant-based meat and mock meat.

Company representation

Domestic brands cater more toward local cuisine, whereas international brands cater more to western formats (Table 1 and Table 2). Local brands are aiming to bring a differentiated offer adapted to local cuisine and taste to avoid competing head-to-head with international brands.

Leading local brands include Next Gen Foods' plant-based chicken, sold under the brand name TiNDLE. TiNDLE is made in collaboration with chefs and features a distinctive chicken flavour due to a proprietary emulsion of plant-based ingredients called Lipi™ that mimics the aroma, texture and savoury taste that usually comes from chicken fat.

International brands tend to be part of a global supply chain where products are manufactured in other Asian countries, including Thailand, Malaysia, Japan and Indonesia or Western nations, including the United States, Australia, Portugal, Switzerland and Canada. For example, even local brand TiNDLE manufactures its product in the Netherlands and exports to Singapore and other regions. The companies shown in Table 1 and Table 2 indicate prominent domestic and international plant-based meat brands sold in Singapore.

Table 1: Domestic plant-based meat brands sold in Singapore, at May 2022

Domestic brands		Plant-based meat products (style and/or format)	Distribution channels
	ALTN	Dim sim, ready meals, nuggets	Foodservice Instore retail Online retail
	Gomama (Growthwell Foods)	Asian ready-to-cook and ready-to-eat meals and sauces (e.g. dim sum)	Foodservice
	Happiee! (Growthwell Foods)	Chicken (popcorn, nuggets), fish (sticks, patty)	Instore retail Online retail
	Hoshay! (Hoshay Food)	Fried chicken, eel	Foodservice
	Karana	Mince, shreds, dumplings	Foodservice Instore retail

Domestic brands		Plant-based meat products (style and/or format)	Distribution channels
	Liang Yi Food	Chicken slice, BBQ meat, meat dumplings, prawn, fish cakes (using a variety of bases, including mushroom, TSP, gluten, konjac)	Foodservice Instore retail Online retail
	NEXT! (Next Foods)	Bacon, chicken chunks	Instore retail
	Seago (Life3 Biotech)	Seafood	Foodservice
	TiNDLE (Next Gen Foods)	Chicken	Foodservice
	Vrab	Crab	Foodservice
	Veego (Life3 Biotech)	Chicken	Foodservice

The above is not a complete list of every available brand.

Table 2: International plant-based meat brands sold in Singapore as of May 2022

International brands		Plant-based meat products (style and/or format)	Brand Origin	Production	Distribution channels
	Beyond Meat	Mince, patty, jerky, sausage	United States	China	Foodservice Instore retail Online retail
	Deliciou	Veggie meal base San Choy Bow, taco, Bolognese, pork	Australia	Australia	Instore retail Online retail
	Fable	Pulled meat made from mushrooms	Australia	Malaysia	Foodservice
	First Pride (Tyson)	Strips, nuggets, bites	United States	Malaysia	Instore retail Online retail
	Future Farm	Meatballs, sausage, burger, mince	United States	United States	Instore retail Online retail
	Gardein	Chicken strips, crab cakes, beef strips, BBQ wings, fish fillets	Canada	United States	Instore retail Online retail
	Green Rebel	Beef steak, beef chunks, beef Rendang, chicken fillet and chicken Karaage	Indonesia	Indonesia	Foodservice Instore retail
	Harvest Gourmet (Nestlé)	Patty, nuggets, mince, schnitzel	Switzerland	Malaysia	Foodservice Instore retail Online retail
	Impossible Foods	Mince and mince-based products such as burger and sausage	United States	United States	Foodservice Instore retail Online retail
	Loma Linda (Above Food)	Seafood (canned & pouch), shelf-stable ready meals	Canada	Thailand	Instore retail Online retail
	Meat Zero (CPF)	Nuggets, patty, ham, ready meals (spag bol, meat with basil and rice)	Thailand	Thailand	Instore retail Online retail
	Next Meats	Kalbi short-rib, skirt steak, chicken fillet, beef Gyudon, burger, meat cutlet, tuna (can)	Japan	Japan	Instore retail Online retail

International brands		Plant-based meat products (style and/or format)	Brand Origin	Production	Distribution channels
	OKK (Growthwell Foods)	Prawns, prawn ball, flower squid, fish nuggets, fish balls, chicken strips, chicken bites, mutton chunks, beef patty, ham, sausage	Singapore	Singapore	Foodservice Instore retail Online retail
	Omni (Green Monday)	Mince, luncheon, strips, dim sim/dumplings, fish fillet, tuna	Hong Kong	Thailand	Foodservice Instore retail Online retail
	Plant Pioneers (Sainsbury's)	Meatballs, burger, chicken pieces, beef wellington	United Kingdom	United Kingdom	Instore retail Online retail
	vEEF (Fenn Foods)	Bacon bits, chicken patty	Australia	Australia	Instore retail Online retail
	Veggis (Enquanto)	Balls, nuggets, patty, schnitzel	Portugal	Portugal	Instore retail Online retail
	yumeat (Ayam Brand)	Luncheon (canned), mince	Malaysia	Malaysia	Instore retail Online retail

The above table is not a fully comprehensive list of brands.

Cellular agriculture companies

As the first nation to approve the sale of a cultivated meat product, Singapore serves as a model for how other countries can commercialise products made with cellular agriculture technologies.

Eat Just, under the brand GOOD Meat, first launched cultivated chicken bites at the 1880 Members Club restaurant in December 2020. The Singapore Food Agency (SFA) approved a second GOOD Meat cultivated chicken breast, and in April 2021 GOOD Meat cultivated chicken was made available on the food delivery app foodpanda, which was promoted for the first time on a billboard.[19] In 2022, GOOD Meat sold cultivated chicken via a pop-up in Loo's Hainanese Chicken Rice for USD4 at Tiong Bahru hawker centre.

Singapore was the second nation after the US to approve the sale of precision fermentation whey proteins produced by Perfect Day. The company launched its 'animal-free' ice-cream sold under the Cool Haus brand in July 2022 and 'animal-free' milk under the Very Dairy brand in November 2022 in select retail outlets.[20]

There is a range of cultivated meat and seafood start-ups with research activities and commercialisation plans in Singapore that have since emerged. Some are detailed later in this report alongside investments shown in Table 3.

GOOD Meat

Cultivated meat served up in Singapore

In February 2022, Singapore's selected food hawkers and restaurants served cultivated chicken grown in bioreactors made by GOOD Meat, a subsidiary of alt-protein brand Eat Just. Loo's Hainanese Curry Rice in Tiong Bahru was selected as the first pop-up to feature Good Meat's cultivated chicken in its famous curry rice dish for SG$4.

After Loo's chicken rice, Keng Eng Kee Seafood teamed up with GOOD Meat to serve its cultivated chicken during a three-day pop-up event in May 2022. At the event, diners could try the cultivated chicken served as satay with cucumber slaw, peanut sauce, fried bee hoon and KEK signature tofu at a price of SG$13.80.

GOOD Meat also partnered with JW Marriott's restaurant Madame Fan and 1880 Restaurant, where cultivated meat was served in special menus created by the establishments during the pop-up events.

Table 3: Cellular agriculture companies with operations in Singapore, as of May 2022

Companies		Location	Area of focus	Approximate disclosed funding (USD)
	Bluu	Germany	Vertically integrated cultivated	$8.4 million*
	GOOD Meat	United States	Vertically integrated cultivated Sales of cultivated chicken products	$461 million*
	Gaia Foods	Singapore	Vertically integrated cultivated	$200,000
	Perfect Day	United States	Vertically Integrated precision fermentation dairy proteins and products	$711 million*
	Shiok Meats	Singapore	Vertically integrated cultivated	$30.4 million
	Sophie's BioNutrients	Singapore	Biomass fermentation (algae)	$1.5 million
	TurtleTree	Singapore	Precision fermentation	$39.4 million
	Umami Meats	Singapore	Vertically integrated cultivated	$2.7 million

*GOOD Meat is headquartered in the US and is owned by Eat JUST, a company that produces plant-based food products. Bluu Seafood is headquartered in Germany. As a result, the investment figures for GOOD Meat and Bluu Seafood have not added to the total investment figure for Singapore.

Product formats

Singapore's diverse ethnic population means companies can introduce products that are tailored to specific demographics.

While Western-style formats, including burger patties, sausages, and crumbed fillets account for most products available, there is a wide range of formats in the market. These include mince and strips adopted across cuisine types and dining experiences, from Asian dishes (such as dumplings and sushi) to international cuisines served in fine dining restaurants. Love Handle, Singapore's first plant-based meat butcher and deli, offers meatless products in various formats, including marinated meat, frozen products and ready-to-eat vegan cold cuts, which suit Western-style cuisine, as well as items catered to Asian cooking (such as Szechuan pepper plant-based meatballs and plant-based chicken satay).[21]

Chicken-style products (crumbed and un-crumbed) are the leading choice among consumers, followed by burgers, sausages and seafood-style products.

According to a report from abillion, which assessed the interest in plant-based products based on the number of reviews on its platform, interest in plant-based chicken and pork is growing at more than double the rate of interest in plant-based beef.[22] With frozen conventional meat common in the market, Singaporeans have a higher preference for frozen formats of plant-based meat, with two-thirds indicating they are interested in purchasing frozen formats in future.

Among the notable launches is Harvest Gourmet's soya and wheat-based Sensational Burger from Nestlé in September 2021, shown in Figure 7. The product promotes health benefits and protein and fibre content while also addressing consumers' concerns about processing. The reverse of the packaging illustrates its ingredients.

Figure 7: Harvest Gourmet's Sensational Burger

Price

Like all countries studied, in Singapore, plant-based meat products are generally sold at a higher price compared to conventional meat equivalents. Meat is expensive in Singapore, and plant-based meat products (crumbed chicken and burger equivalent products) are also consistently high priced in Singapore compared to other markets.

Singaporean consumers are price sensitive with 60% expecting price parity between plant based and conventional meat products and 23% expecting to pay less.

Table 4: Price comparisons, selected plant-based meat products[23]

Product format	Average price per 100g of imported plant-based meat	Average price per 100g of conventional meat	Price premium for plant-based meat in comparison to conventional meat	Total pack size of plant-based meat
Chicken-style, crumbed	USD2.02	USD1.11	**82%**	154-500g
Sausages	USD2.17	USD2.10	**3%**	235-400g
Burger	USD3.55	USD1.86	**91%**	150-450g
Pork or chicken-style strips	USD2.34	USD1.68	**39%**	150-420g

Source: Mintel Global New Products Database.

Partnerships

Partnerships with restaurants are a gateway for many plant-based meat companies launching in the Singapore market, where, like most foodservice and retail markets, it is complex and requires distribution partners.

By partnering with a foodservice management company, for example ISS Catering Services, one of the largest in the market, plant-based meat brands can reach a range of cafeterias, restaurants and other foodservice establishments nationwide for faster scaling.[24]

Local brands TiNDLE and Karana both collaborated with popular foodservice chains and local restaurants. Such presence across local foodservice outlets helps to increase consumer brand awareness and familiarity with plant-based meat offerings, which can, in turn, support grocery retail sales.[25] Several local and international brands have partnered with local meal kit subscription services (such as Insane Meals) to increase consumer awareness and trial.[26]

Institutional partnerships are another key component of the industry ecosystem in Singapore, including international collaborations. Cultivated meat brand Avant Meats plans to establish a production plant that would also host a research laboratory in partnership with the Agency for Science, Technology and Research (A*STAR) Bioprocessing Technology Institute.[27] Official partnerships have also been established between Singapore-based start-up TurtleTree Scientific, a spin-out of TurtleTree Labs, and fermentation company Dyadic to produce growth factors, as well as with China-based JSBiosciences to produce cell-culture media at a commercial scale.[28]

The Singaporean Government is prioritising partnerships and collaboration for the development of alternative proteins. Under programs such as FoodInnovate, Enterprise Singapore cooperates with A*STAR, the Economic Development Board, Intellectual Property Intermediary, JTC Corporation and the Singapore Food Agency to offer a number of resources that allow Singapore-based food companies to design and commercialise food products faster, as well as collaborate with multinational companies, start-ups, food science experts and industry associations.[29] In another example, SFA, A*STAR and the Nanyang Technological University collaborated to launch the Future Ready Food Safety Hub (FRESH) in early 2021 to drive food safety science and innovation.[30]

The world's first hybrid meat innovation centre, where plant based, cultivated meat and products of fermentation or algae is combined in the final finished product, is set to open in 2023. A collaboration between Dutch cultivated pork company Meatable and local Singapore plant-based butcher Love Handle, Meatable is currently in advanced discussions with the SFA as it seeks regulatory approval.[31]

Manufacturing and sourcing

Singapore's food manufacturing industry contributes SGD4.3 billion (1.1%) of the nation's GDP per year. Announced in 2019, the Singapore Government's '30 by 30' strategy plans to expand local agrifood infrastructure to produce 30% of the domestic population's nutritional needs locally and sustainably by 2030. This policy was accelerated by COVID-19, and as of early 2022, the domestic production capability is at 10%.[32] With only 1% of land dedicated to agriculture, Singapore is exploring new areas and techniques for food production, as well as innovations to increase agricultural yield in urban settings.

In addition to aquaculture and vegetable production, alternative protein processing and cellular agriculture technologies are a major focus of the 30 by 30 plan.[33] Singapore does not have the landmass to grow broadacre crops commonly used for plant-based meat production, namely soybean, wheat, chickpea, lentil, mung bean and field pea.[34] This may present an opportunity for direct imports of specialty grains and pulses as well as finished and semi-finished goods from Australia and New Zealand. A recent report by the Good Food Institute (GFI) APAC found great potential for mung beans as an ingredient to diversify protein sources in SouthEast Asia.[35]

Singapore is one of the few Asian markets with established high moisture extrusion (HME) capabilities needed for certain plant-based meat production. The recent expansion of several companies' production facilities in Singapore signal the next evolution in HME capacity in the region. Notable developments in this area include Shandi Global's HME production facility, Growthwell's HME plant-based meat production facility, and SG Protein's HME co-manufacturing plant for white labelling. Other operators have also indicated plans to expand their extrusion capability, namely the Food Innovation and Resource Centre, FoodPlant @ SIT, and the Food Tech Innovation Centre, backed by Temasek and A*STAR.

SG Protein is one of the major plant-based meat white labelling manufacturer in Southeast Asia. Coupled with the Protein Innovation Centre, a collaboration between Bühler and Givaudan, Singaporean companies and start-ups can order small batches at a low price to experiment with recipes, ingredients, flavours and culinary applications while developing their products for market entry. This presents a lower-risk sourcing opportunity for companies scaling their local production.

As for cultivated agriculture, following the first product approval, GOOD Meat's cultivated chicken, Esco Aster, received approval for the commercial production of cultivated meat in Singapore. Esco Aster can act as both a contract manufacturer and a direct manufacturer, offering cultivated meat start-ups the potential to accelerate their go-to-market plans leveraging Esco Aster's CellFarm-to-Table™ platform. Esco Aster was also the first cultivated meat manufacturing facility granted ISO 22000 food safety certification in June 2022[36] with recently announced plans to significantly expand its capacity by 2025.[37]

The Singapore Government's '30 by 30' strategy plans to expand local agrifood infrastructure to produce 30% of the domestic population's nutritional needs locally and sustainably by 2030.

Ingredients

In Singapore, plant-based products and ingredients are most popular when they appeal to health-conscious consumers and fit the diverse local cuisines. Many of these products are promoted with low fat, high protein and high fibre content claims.

For example, TiNDLE plant-based chicken, which is used by several brands and restaurants in Singapore, is promoted as tasting 'like chicken with no GMO ingredients, no added MSG, no antibiotics, no cholesterol, no hormones or synthetic colouring'.

Soy and wheat are commonly used as protein sources in plant-based meat products, especially for local cuisines, mostly due to cost and availability of these ingredients. Conversely, some western consumers prefer soy and gluten-free products, and companies (such as TiNDLE) cater to this. Wheat is often used as a texturising ingredient and some international plant-based meat manufacturers also include other sources of plant protein, such as pea and rice. According to industry experts, pea protein incurs higher costs due to fractionation requirements and difficulties with supply chains. Mushrooms (for example, Australian company Fable Food Co.), jackfruit (for example, Karana) and konjac are used as ingredients in some plant-based meat products to help deliver a meat-like texture.[38]

Increasingly there are opportunities for blended products that contain a combination of both plant and animal ingredients. The Singaporean fish ball was traditionally made with 70% to 80% wild cod fish, and this is now down to 20% or less, bulked up with less expensive ingredients, including flavour enhancers and starches. There is an opportunity to incorporate plant-based meat ingredients into these products to improve taste and nutrition and achieve a price that is agreeable to customers.

More cultivated meats are expected to emerge in the market following initial regulatory approvals in 2020. GOOD Meat's cultivated chicken is available in limited quantities and across a number of temporary pop-up activations at popular hawker centres, a five star hotel, and a retail butcher to raise awareness and drive trials. Singapore's Shiok Meats is currently developing new products, such as cultivated red meat and quail, through its wholly owned subsidiary Gaia Foods, with plans for regulatory applications and commercial availability in the near future.[39]

Investment

The Singapore Government's '30 by 30' goal is accelerating investment in alternative proteins. The Singapore Food Agency (SFA) and the Agency for Science, Technology and Research (A*STAR) jointly developed the Singapore Food Story R&D Programme to drive research in sustainable urban food production, future foods and food safety science and innovation. A total of SGD144 million (USD102 million) was allocated for this programme as part of the government's Research, Innovation and Enterprise 2020 (RIE2020) plan. Projects were awarded that addressed two main themes; sustainable urban food production and future foods: alternative proteins. Grants under the latter module will help develop the alternative proteins value chain, including plant-based proteins, microbial proteins and cultivated meats.[40] In 2021, Singapore provided USD45.2 million in funding for the establishment of the Agri-Food Cluster Transformation Fund to continue to foster technology adoption in the agrifood sector.[41]

Public sector R&D facilities include the Singapore Institute for Food and Biotechnology Innovation, with research spanning from novel ingredient discovery to food process engineering, as well as the Food Innovation and Resource Centre, providing technical expertise in new product and process development. In the academic sector, the National University of Singapore Department of Food Science and Technology and the Food Science and Technology Programme at Nanyang Technological University provide leading research in the development of alternative proteins, while the Singapore University of Technology and Design has capabilities in 3D food printing and food ink formulation.[42]

Singapore also has significant corporate investment, with more foreign food and beverage company R&D centres than any other city in the world. According to the Good Food Institute APAC, there are approximately 29 private sector facilities that have either a test kitchen, application or research laboratory or pilot plant in the plant-based meat ecosystem. Notable facilities among these include the Protein Innovation Centre, Singapore's first industrial-scale plant-based meat innovation centre, established by international food companies Bühler and Givaudan in 2021. US-based ADM also set up a plant-based innovation lab in Singapore in 2021 to accelerate development of plant-based solutions catering to Asian consumers' tastes as well as investigate process innovation and price improvements.[43]

In the cellular agriculture sector, investment in Singaporean companies has exceeded USD100 million, as Table 3 on page 76 shows.

Regulatory and trade overview

Favourable regulations are one of the factors supporting Singapore's industry growth in plant-based meat and cellular agriculture. Compared to other Asian markets, Singapore has the most favourable business conditions, and it has an established regulatory framework for cultivated meat and novel foods. Australian company Vow Foods is in the late stages of seeking approval for sale of its' cultivated quail product in Singapore.[44]

Compared to other Asian markets, Singapore has the most favourable business conditions, and it has an established regulatory framework for cultivated meat and novel foods.

Trade agreements

Singapore offers one of the world's most business-friendly and simplified regulatory and taxation environments. Australian exporters have tariff-free access under the Singapore-Australia Free Trade Agreement (SAFTA).[45] During the Australia Singapore Annual Leaders' Meeting in 2022, the Prime Ministers agreed to begin work on a bilateral Food Pact to support enhanced supply chain resilience and greater flows in trade and investments of Australian and Singapore food supply.[46] In New Zealand exporters are supported via the Closer Economic Partnership (CEP)[47] between New Zealand and Singapore, as well as the Transpacific Strategic Economic Partnership (P4).[48]

Australian and New Zealander exporters also have tariff-free access under the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP)[49] and ASEAN-Australia-New Zealand Free Trade Agreement (AANZFTA).[50] In 2022, Singapore and Australia signed the Singapore-Australia Green Economy Agreement. This first-of-its-kind agreement outlines areas of cooperation in economic, trade, investment and climate change objectives, including sustainable food systems.[51]

Definitions and classifications

Table 5: Regulatory definitions and classifications

	Specific definition	Defined as:
Standard food	Yes	The Sale of Food Act and its subsidiary legislation, i.e. Food Regulations 1988 (as amended).[52]
Alternative protein	No	Classified as either standard foods or novel foods, depending on their history of safe use. A food would be classified as novel food if it does not have any history of safe use.
Novel foods	Yes	Foods and food ingredients that do not have a history of safe use. Substances with a history of safe use are those that have been consumed as an ongoing part of the diet by a significant human population (e.g. the population of a country), for a period of at least 20 years and without reported adverse human health effects. Food and food ingredients that are shown to have a history of safe use will not be considered novel foods. Novel foods may also include compounds that are chemically identical to naturally occurring substances but produced through advances in technology (e.g. production of functional ingredients through precision fermentation).[53]
Cultivated meat	Yes	Cultivated meat refers to meat developed from animal cell culture. The process of producing cultivated meat involves growing the selected cell lines (or stem cells) in a bioreactor. The cells are grown in a suitable growth media and may subsequently be assembled on a 'scaffold' to produce products resembling meat muscle[54].
Precision or biomass fermentation	Yes	Defined as a novel food if: • it does not have a history of safe use; or • it is a compound that is chemically identical to a naturally occurring substance but has been produced through advances in technology (e.g. production of functional ingredients through biomass and precision fermentation).
Plant protein and plant-based meats	Yes	Defined as standard food if it has not been produced through advances in technology and provided they have a history of safe use.

Table 6: Permissibility of standard foods and alternative proteins

	Approvals required?	Regulation
Standard foods	No	Specific compositional standards for plant protein or plant-based meat have not been established under the regulations. Additionally, specific compositional standards for analogues have also not been established. In the absence of specific standards, such products must be safe for human consumption (e.g. they meet the general chemical and microbiological requirements and contain only permitted food additives under the food regulations).
Novel foods	Yes	The production/manufacture, import, distribution, and sale of novel foods or foods containing novel food ingredients in Singapore are prohibited unless pre-market approval from the SFA has been obtained. Pre-market approval from the SFA must first be obtained before the import and sale of: • fermentation-based products (e.g. mycoprotein) and cultivated meat/seafood products • foods containing fermentation-based products (e.g. Quorn products) and cultivated meat/seafood products. The maximum limits of fermentation-based products and cultivated meat products in foods would depend on the pre-market approval obtained for such products.
Genetically Modified (GM) foods	Yes	Pre-market approval would be required to import or market GM food. Applications for the import or release of GM organisms (including GM food) are first evaluated by the Genetic Modification Advisory Committee (GMAC) in accordance with the GMACs Guidelines on the Release of Agriculture related GM organisms. On completion of the safety evaluation, GMAC will make its recommendations to the Singapore Food Agency. (SFA), the national food safety authority. GMACs endorsement of the GMO will be one of the criteria that SFA takes into consideration when granting the final approval of the application.

Table 7: Labelling and naming regulations

Labelling	**No specific requirements for alternative proteins. In the absence of specific provisions, general labelling requirements apply.**
Product name (general)	The product name must be the common name or, in the case where a suitable common name is not available, a description sufficient to indicate the true nature of the food. The use of conventional meat names that are standardised under Part IV of the Food Regulations as such is not recommended; for example: 'minced or chopped meat', 'hamburgers or beef burgers', 'sausage meat' and 'sausages'. Additionally, false differentiation is not allowed; for example, 'cholesterol-free margarine' on margarine is not allowed as all margarines are cholesterol-free.[55]
Product name (alternative protein)	Products should be qualified by appropriate terms (such as 'mock', 'cultured', 'cell-based, 'cultivated', or 'plant-based') to indicate their true nature so that consumers may make informed decisions when deciding whether to consume these products. Therefore, the use of conventional meat names (such as 'chicken', 'beef', 'burger' and 'sausages' in product names would be permitted if they are qualified by appropriate terms (such as 'mock', 'cultured', 'cell-based', 'cultivated', or 'plant-based'.

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South Korea

Summary

South Korea, officially the Republic of Korea, has a stable and resilient economy and, along with China, has the highest projected compound annual growth rate in the meat substitutes market in the next five years.

South Korea has a highly competitive landscape for plant-based meat products and also a low price gap with conventional meat compared to the other countries in this report. The perception that Australian and New Zealand products are environmentally friendly and have natural ingredients is strongest in South Korea. The rise in single households and demand for convenience makes South Korea a receptive market for Western products and local adaptations of ready meals.

Australia and South Korea are strategic partners with a strong bilateral relationship underpinned by trade, shared regional strategic interests and strong people-to-people links.[1] South Korea is Australia's fourth-largest trading partner and New Zealand's fifth-largest. These strong trading relationships are facilitated by several bilateral and multilateral trade agreements, including the Korea-Australia Free Trade Agreement (KAFTA), the Korea-New Zealand Free Trade Agreement (KNZFTA) and the Regional Comprehensive Economic Partnership Agreement (RCEP).[2] In 2022, South Korea announced it would apply to join the Comprehensive Progressive Agreement for Trans-Pacific Partnership (CPTPP), which both Australia and New Zealand have ratified.

South Korea's favourable market size, high volumes of imported food, and rate of innovation relative to other Asian markets make it the third-most-favourable market for alternative protein exports.[3] In 2022, meat substitutes sold in retail reached USD77.19 million in revenue, equivalent to USD1.50 per capita. With a 20% CAGR between 2022 and 2027, volumes are projected to reach 15 million kg by 2027.[4]

> **The key contributing factor to the success of international brands in this market is that the production cost of ingredients is low. An effective way to enter the market would be to provide ingredients to local manufacturers or collaborate with local franchise restaurants/food companies to produce meal kits/frozen meal products.**
>
> **Taekyong Nongsan**
> Veggie Garden Brand Manager

Market landscape

Socio-economic and cultural environment

South Korea is the tenth largest economy in the world, with a GDP of USD1.63 trillion. While it faced a small economic downturn during COVID-19, its resilience compared to other countries means it climbed two places in the International Monetary Fund global rankings.[5] Like Singapore, South Korea is one of the few countries that has grown from a low-income to a high-income country. What started as an agricultural-based economy in the 1960s is now a global leader in innovation and technology with a business-friendly regulatory environment driving decades of economic growth.[6]

In 2021, South Korea imported USD17.3 billion in consumer goods–40% of this was agricultural imports. While South Korea is Australia's third largest trading partner (importing about AUD44.4 billion)[7] and New Zealand's fifth largest (importing about NZD2.28 billion),[8] each country only comprises 10.8% and 3.6% of South Korea's imports, respectively.[9] South Korea's key trading partners include the United States and China.[10]

South Korea is a highly urbanised country, with 90% of people living in urban areas and experiencing rising disposable incomes.[11] As incomes increase, more South Koreans are diversifying their diets and exploring high-end food products and trends.[12] Exposure to foreign cultures (especially among young people) has fuelled a growing interest in foreign cuisines. This leads to strong competition between exporting countries and South Korean brands that are developing Western food products. South Koreans are very concerned about food safety and often perceive local foods to be of higher quality than imported foods.[13]

South Korean cuisine is eaten around the world due to the popularisation of the country's food, music and film industries.[14] A typical South Korean meal comprises between two and twelve side dishes alongside rice or noodles. The side dishes are usually made from pickled, salted and fermented products (such as kimchi) and are accompanied by a main dish of meat, fish or tofu. Meals are served family style for sharing around the table.[15] Korean barbeques are also popular, with meats (such as pork and beef) accompanied by marinades and sauces as the main dishes.[16]

Retail and foodservice landscape

Total retail food revenue in South Korea reached USD103 billion in 2020,[17] which represented 29% of total retail sales. The largest food retail channel is supermarkets, followed by online retailers, hypermarkets, convenience stores and department stores.

In 2020 online retail stores grew by 17%, and online retail and convenience stores are projected to increase at a higher rate than other channels by 2030. Some supermarkets are moving from in-person stores to e-commerce. Large and modernised retailers have gained share from smaller, traditional grocers, resulting in a more efficient environment for imported goods distribution.

The rise in single-person households and long working hours has led to the growth of ready meals and meal kits available at convenience stores and delivery services. Offering plant-based meat in these meal formats and partnering with delivery platforms could appeal to South Koreans seeking convenience.

South Koreans are increasingly interested in convenience. Convenience stores offer everyday items and are open 24/7. They have seating areas, microwaves, postal services and facilities for re-charging transport cards and paying utility bills.[18] Convenience store chains are increasingly using big tech (such as artificial intelligence and robot delivery services) to reach consumers.[19]

Some industry experts have observed that major Korean food conglomerates are redirecting resources into other net-zero initiatives following limited success in the introduction and marketing of new plant-based brands and products.

Industry experts also report that stakeholders have mentioned that there is an emerging preference for a 'low carb, high fat' diet among Korean consumers, which is driving up demand for meat. The Korean Government has recently issued significant support for the Korean beef industry, which hopes to reduce Hanwoo (Korean cattle breed) retail pricing and drive demand for more meat.[20]

In the foodservice sector, restaurant and bar sales totalled USD124 billion in 2019, a 4.5% growth from 2018. Full-service restaurants make up half the sales, followed by bars that serve alcohol (8%). Cafes and quick service restaurants (QSRs) experienced the highest growth in 2019, a trend that is expected to continue with time-poor, price-sensitive consumers seeking convenience and new flavours. With increased competition favouring economies of scale, franchise foodservice chains have gained ground, comprising 17% of Korean restaurant and bar sales in 2018.[21]

The institutional foodservice sector in South Korea (such as schools, corporate headquarters, hospitals, and entertainment facilities) represented 7% of the restaurant and bar industry sales in 2019 at about USD8.7 billion. This sector tends to be supplied by importers, wholesalers and large distributors.[22] Plant-based products are also gaining ground in this sector. The Seoul Metropolitan Office of Education has announced that select schools will offer plant-based options as part of the 'eco-conversion education program', to be rolled out between 2020–24.[23]

Industry experts also report that stakeholders have mentioned that there is an emerging preference for a 'low carb, high fat' diet among Korean consumers, which is driving up demand for meat.

Consumers

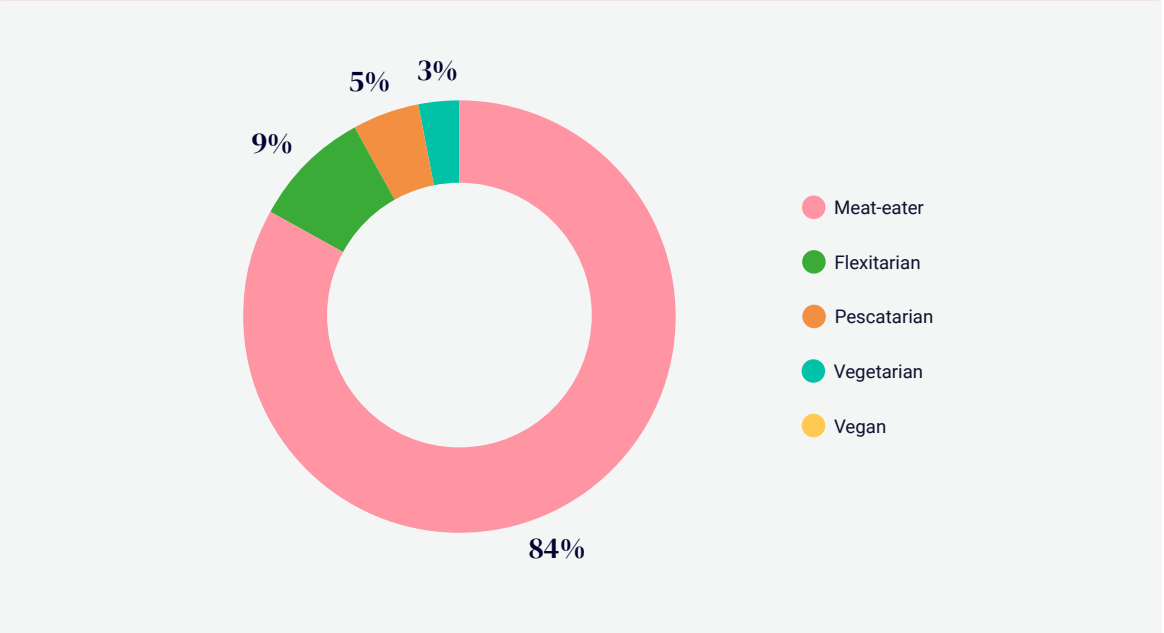
Dietary preferences

While the majority of South Koreans are meat eaters, 26% of consumers indicated they wanted to reduce meat consumption. Nine percent claim to be flexitarian, as Figure 1 shows.

A preference for flexitarianism is significantly higher among people aged 45 years and over (14%) and parents (12%). Although representing a small proportion of consumers, the pescatarian diet is among the top three popular diets in South Korea and is more prevalent among those 45 years and over. Vegetarian and vegan diets remain a minority in South Korea, with only 3% of consumers identifying as such. The adoption of flexitarian diets is driven by health and sustainability concerns and consumers' openness to exploring Western food trends.[24]

One-quarter (26%) of South Koreans expressed interest in reducing at least one type of meat/seafood in the next six months, regardless of dietary preference. The interest in reducing fish and seafood is slightly higher at 16% compared to red meat and poultry (10% and 8% respectively) and is significantly higher among consumers with low monthly household income (25%), potentially because seafood is in shorter supply and has driven up prices, at the time of writing this report.

Figure 1: Dietary preferences



Base: 1,000 internet users aged 18-45+
Source: Rakuten Insight/Mintel.
Meat-eaters eat red meat or poultry.
Flexitarians eat plant-based options at some meals, replacing red meat, poultry, fish/seafood, eggs or dairy.
Pescatarians eat no red meat or poultry but eat fish/seafood, dairy and eggs.
Vegetarians eat no red meat/poultry or fish/seafood but eat dairy and eggs.
Vegans eat no animal products.

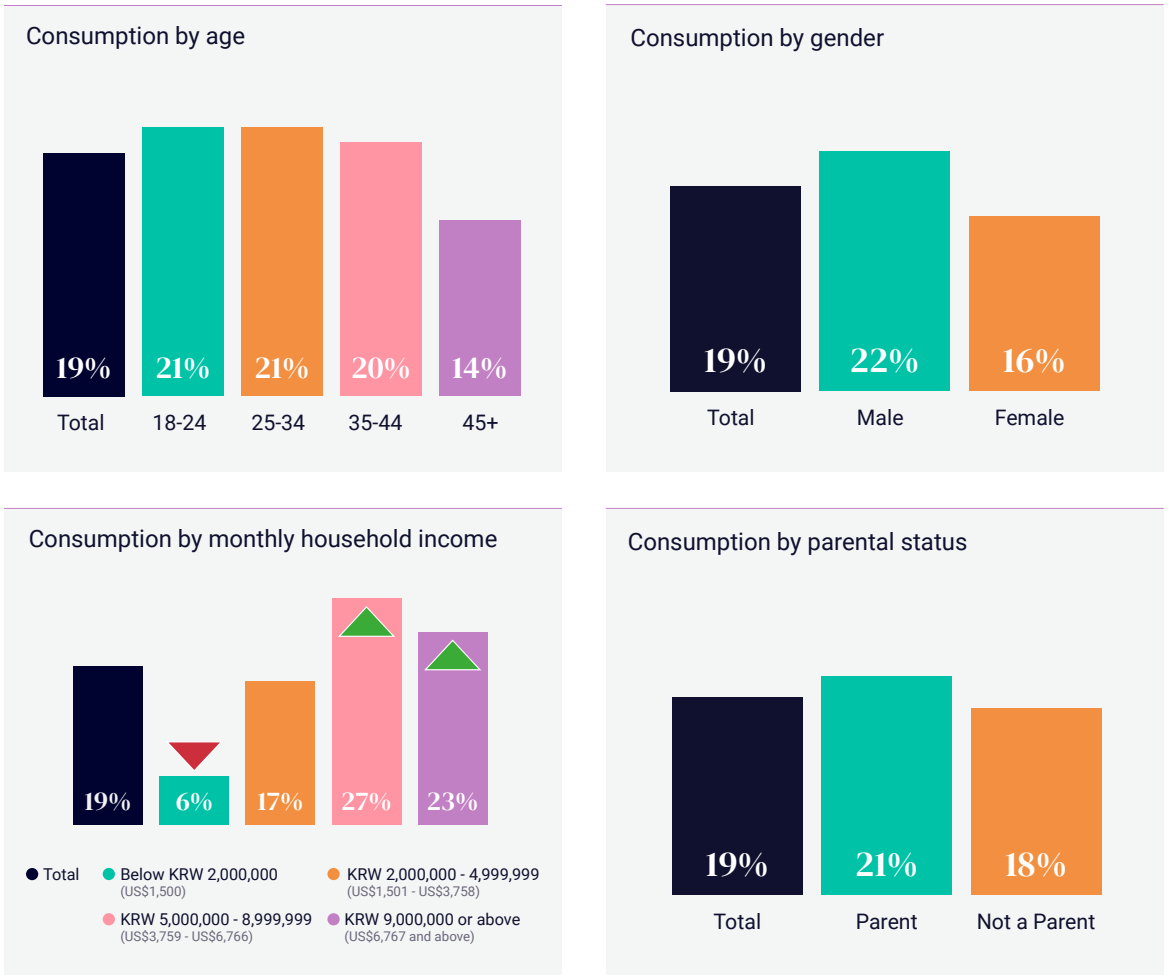
While the majority of South Koreans are meat eaters, 26% of consumers indicated they wanted to reduce meat consumption.

Plant-based meat consumption

About one in five South Koreans indicated they have eaten plant-based meat at home or at restaurants and other outlets in the past six months, with a trend observed towards slightly higher consumption among males.

Consumption of plant-based meat is significantly higher among consumers who have a monthly household income above KRW 5,000,000 (about USD3,856), and KRW 9,000,000 (about USD6,767), and significantly lower consumption indicated in monthly incomes less than KRW 2,000,000 (about USD1,500), as Figure 2 shows. While consumers aged 45 years and over are more likely to be flexitarians or pescatarians, consumption of plant-based meat is relatively lower for this age group, suggesting an opportunity for plant-based meat brands to cater to the needs of these age groups with functional health claims.

Figure 2: Plant-based meat consumption, by demographic



Base: 1,000 internet users aged 18-45; 950 internet users aged 18-45+ who shop for groceries in the household.
Source: Rakuten Insight/Mintel.

▲ Significantly higher than total at 95% confidence interval. ▼ Significantly lower than total at 95% confidence interval.

Drivers

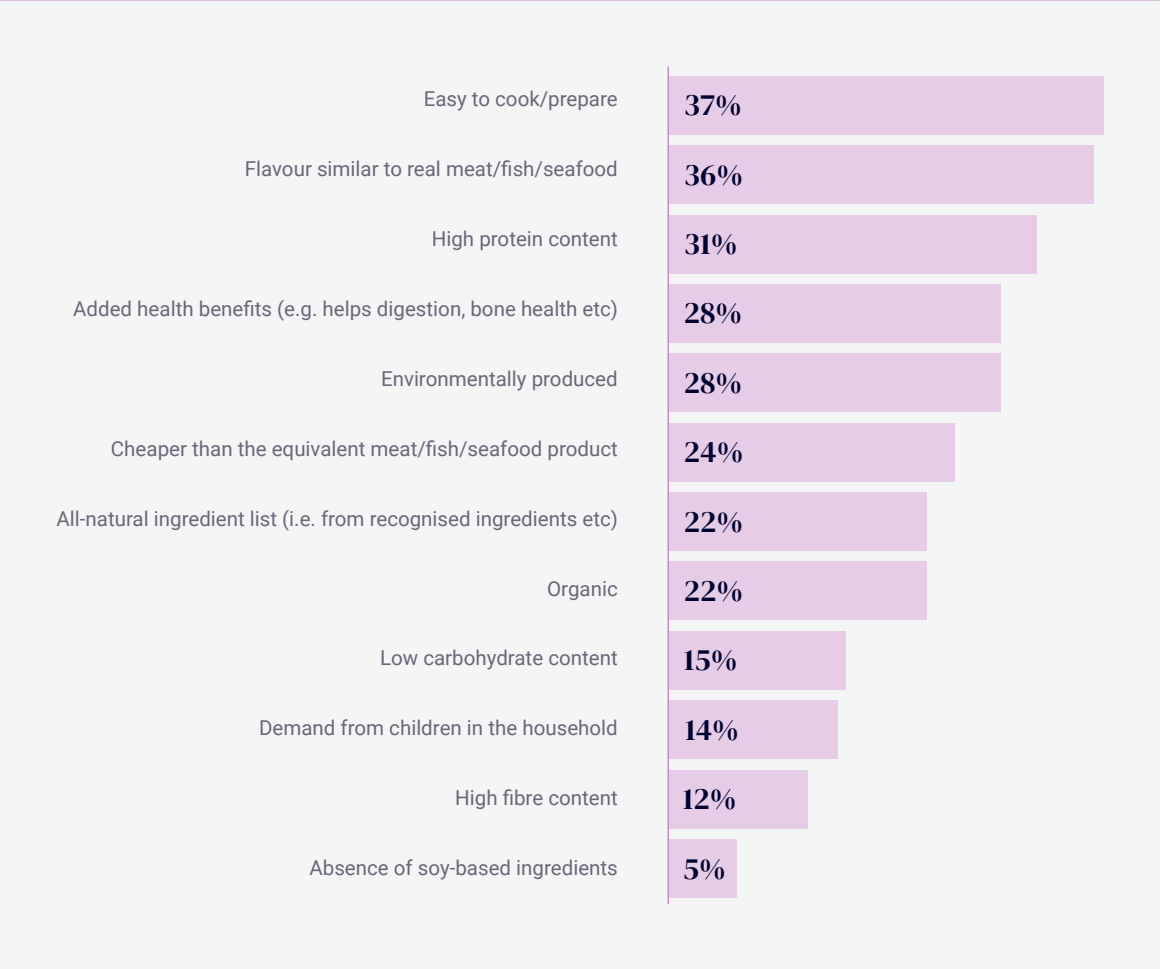
Key drivers for South Koreans who consume plant-based meat are to improve overall health (39%), taste preferences (33%), environmental concerns (28%), safety concerns including avoiding animal-borne diseases (25%), to add more variety of proteins to diet (25%), and reducing consumption of meats (21%).

South Koreans prioritise convenience and taste when purchasing plant-based meat, with ease of preparation and similar flavour to conventional meat ranking as the top two factors, as Figure 3 shows.

As consumers become more health and environmentally conscious, they are naming high protein content, added health benefits and environmentally produced among the top five most important factors when purchasing plant-based meat.

Combining the top five factors will allow brands to reach more than eight in ten consumers. Added health benefits (28%) and environmentally produced (28%) attributes are significantly higher among consumers aged 45 years and over. Communication of the nutritional and health benefits of plant-based meat products (e.g. high protein, muscle growth, satiety) could help to increase adoption. South Koreans might also resonate with plant-based meat's sustainability benefits.

Figure 3: Factors when purchasing plant-based meat products



Base: 793 plant-based meat buyers aged 18–45+ who would consider purchasing again or non-plant-based meat buyers who would consider purchasing in the future.
Source: Rakuten Insight/Mintel.

Barriers

More than one-third of consumers who don't eat plant-based meat cite taste as the biggest barrier to eating these products, as Figure 4 shows.

The second highest barrier is price; there is more information about price comparisons in Table 4. Poor taste and high price are common barriers to entry for current plant-based meat options across the countries surveyed for this report. In-country experts note that many Koreans perceive plant-based meat products as having too many preservatives.

Figure 4: Barriers to consuming plant-based meat

36% Not tasty

29% High price

20% Do not like the texture

18% Doesn't fit with types of dishes I/we like to cook

18% Too processed

Base: 244 plant-based meat consumers aged 18–45 who would not consider consuming again or non-plant-based meat consumers who would not consider consuming the product in the future.
Source: Rakuten Insight/Mintel.

Tailoring to South Korean tastes

Since most plant-based meat brands are from domestic companies, many of the products launched are well-catered to the local food culture and taste preferences of South Korean consumers.

Notable innovations that are unique to the South Korean plant-based meat market are products developed to mimic South Korean traditional meat dishes, which are prepared using various cooking techniques. In the past few years, companies have been launching plant-based versions of uniquely prepared meats (such as bulgogi—marinated barbecued meat slices, tteokgalbi—grilled beef patties traditionally made with marinated ground beef short ribs—and hambak steak—ground burger patty typically served with savoury and tangy sauce).

Pulmuone grilled plant-based Bulgogi with Spicy Sauce (below left) was launched in January 2022 and is made with soy protein, and Pulmuone plant-based Bulgogi Fried Rice (below right) is made with soy protein in bulgogi sauce, launched in April 2022.

Pulmuone grilled plant-based bulgogi products

Country of origin preferences

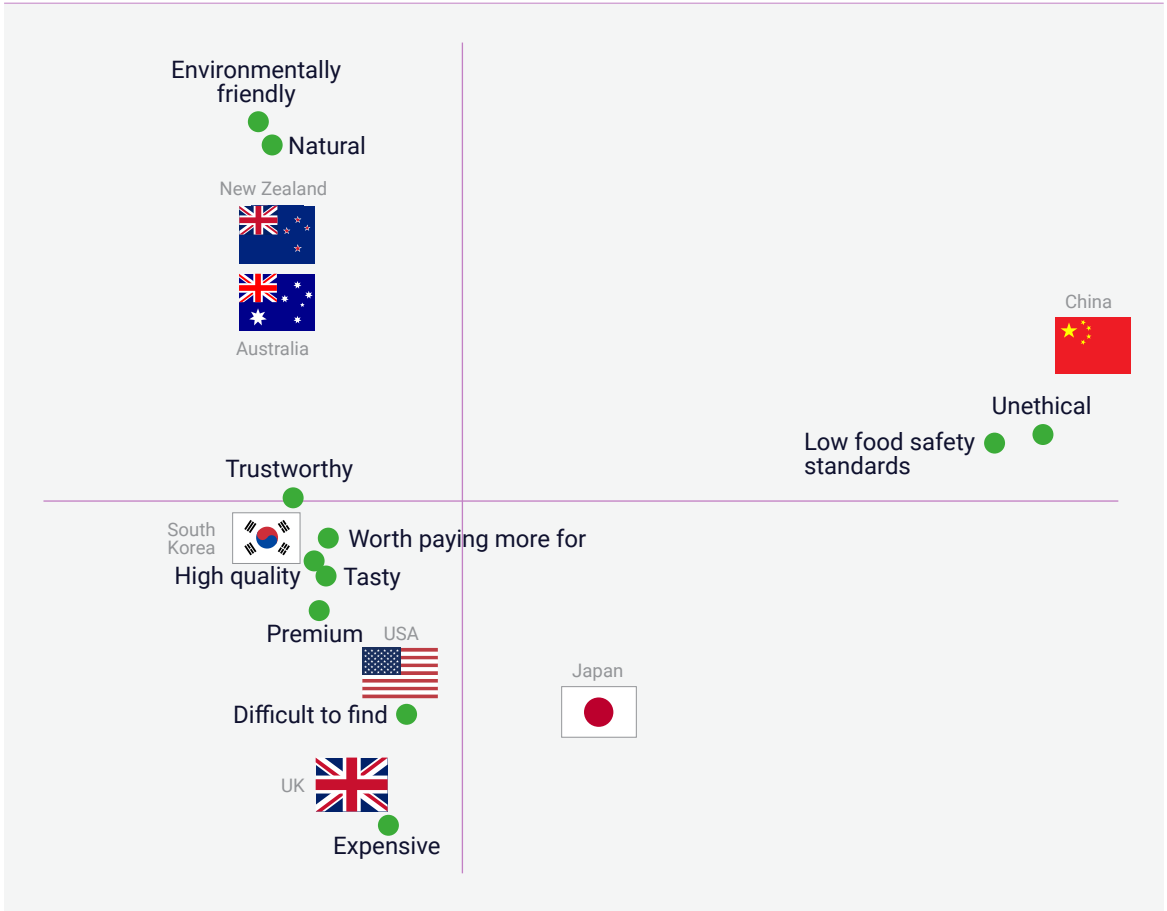
South Korean consumers have a strong preference for local products, which are viewed as more trustworthy, high-quality, premium, tasty and worth a higher price.

That said, Australian and New Zealand products are perceived as being more natural and eco-friendly, which offers the potential to stand out in the market, given environmental and food safety concerns are key motivators for consuming plant-based meat in this market.

Although to a lesser degree, South Koreans also have an issue with the highly processed image of plant-based meat offers, which perceptions of Australian and New Zealand products being 'natural' could help to counteract.

Relative to other foreign markets evaluated, Australian and New Zealand products have the most favourable perceptions, as Figure 5 shows. Products from the United States and the United Kingdom are seen as more expensive and difficult to find, while Chinese products come across as being unethical and having low food safety standards.

Figure 5: Perceptions of provenance



Correspondence analysis measures the relationship between and within two groups of variables and is used for perception measurement in market research. In this research, country perceptions were measured against the range of attributes represented in Figure 5. It is a statistical visualisation method for picturing the associations between rows (image, attitudes) and columns (brands, products, segments, etc.) of a two-way contingency table.
Base: 1,000 internet users aged 18+.
Source: Dynata/Mintel.

Place of purchase and frequency

South Koreans are multichannel shoppers, with 81% of consumers shopping for groceries instore and online; this is true for plant-based consumers as well (80%). Supermarkets and hypermarkets are the most common channels (87%) for grocery shopping, followed by online retailers at 60%. As previously noted, the online category is growing in popularity. Plant-based meat consumers are more likely to shop in traditional markets, convenience stores, natural supermarkets and drugstores, as well as in online retailers and delivery apps. This suggests a preference for freshness and convenience solutions among plant-based meat consumers.

About one in five South Korean consumers surveyed claim they have personally consumed plant-based meat either at home or at restaurants/food outlets in the past six months. Fourteen percent of consumers claim to have purchased plant-based meat at retail outlets in the past six months. Given that there is a higher proportion of consumption of plant-based meat in restaurants/food outlets, manufacturers may encourage more in-home consumption of plant-based meat by offering ready meals.

Consumers generally look to social media (33%), traditional media (such as TV and radio, 32%), food and beverage brands (30%), and food and beverage retailers (29%) to learn more about plant-based meats. Consumers who rely on social media tend to be aged 18–24 years (37% vs total at 33%), while consumers 45 years and over-rely more on traditional media (38% vs total at 32%).

Consumer perceptions of cellular agriculture

One-third of South Koreans are aware of cultivated meat, and many express concerns over the unfamiliarity and unnatural aspects of the technology. There is interest in purchasing cultivated meat products when they become available, with 3% indicating they would definitely purchase the product if it was available and 29% indicating they would likely purchase it.

Taste is also a key concern around cultivated meat, but it is positively perceived as highly environmentally friendly and unique. Besides raising awareness and educating consumers about the safety of the technology, cultivated meat start-ups can leverage these two key product benefits to encourage trial among South Koreans, who are conscious about their food choices and how they impact the environment.

Consumers expressed similar concerns over products of precision and biomass fermentation, citing unfamiliarity (51%), taste (33%) and perceptions of unnaturalness (32%). South Korea's awareness of new methods of precision and biomass fermentation is lower than cultivated meat, with only 14% saying they have heard of the technology. Consumers are slightly more open to purchasing products from precision and biomass fermentation, with 3% saying they would definitely purchase and 34% saying they would likely buy it.

Products of precision and biomass fermentation are associated with being environmentally friendly and having unique and exciting attributes, which can strike a chord among South Koreans who are environmentally conscious and who enjoy seeking a unique dining experience.

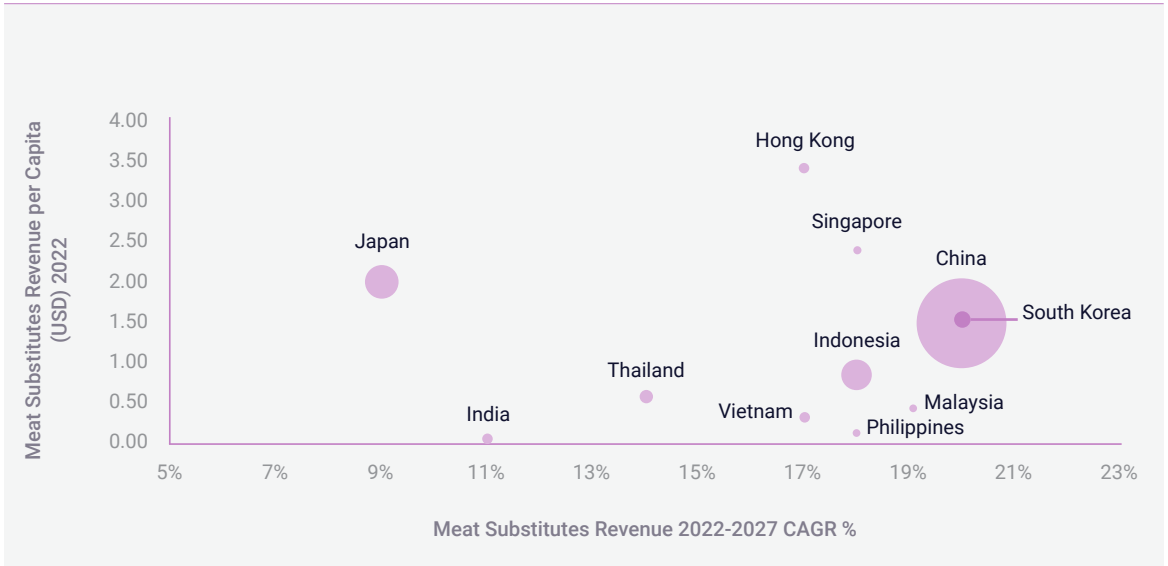
Alternative proteins landscape

Market size

South Korea's meat substitutes market reached a total revenue of USD77.19 million in 2022, equivalent to USD1.50 per capita, as Figure 6 shows. South Korea has one of the highest growth rates in the region alongside China (37%, volume), with the market projected to grow at a CAGR of 20% between 2022 and 2027.[25]

Some industry experts predict the growth could be up to 30% in the next five years. South Korea's volume of meat substitutes sold in retail was expected to reach 5.1 million kg in 2022, which equates to 0.1 kg per capita. With a 24% CAGR between 2022 and 2027, volumes are projected to reach 15 million kg by 2027.[26]

Figure 6: Meat substitutes market revenue size and growth, by selected Asian markets



Note the size of the bubble represents the total meat substitutes revenue (million USD) in 2022. As defined by Statista, the Meat Substitutes segment covers plant-based meat and mock meat.

Company representation

Table 1, Table 2 and Table 3 show a range of domestic and international alternative protein brands and companies producing plant-based meat or developing cellular agriculture products in South Korea. The South Korean market is dominated by local companies, which account for over 90% of all plant-based meats launched by May 2022, as Table 1 and Table 2 show. The key players in the domestic market can be broadly categorised into traditional vegan product companies, emerging start-ups and major local food companies.

South Korea has attracted leading international plant-based meat companies (such as US-based Beyond Meat, Hong Kong's Omni and Australian-based v2food), shown in Table 2. Partnering with Burger King in South Korea, v2food supplied plant-based burger patties for 'Plant Whoppers' across all 240 outlets in the country.[28] Local industry experts point out that international products can lack competitiveness in the Korean market due to high prices, as well as the product format and taste not being aligned with Korean consumers' needs. For instance, burger patties are not heavily consumed in this market, while dishes such as Bulgogi (stir-fried pork) are said to drive more sales. This indicates that companies should localise their formats and cuisine offerings to suit popular South Korean dishes rather than introduce Westernised products.

The South Korean market is dominated by local companies, which account for over 90% of all plant-based meats launched by May 2022.

Table 1: Domestic plant-based meat brands sold in South Korea, at May 2022

Domestic brands		Plant-based meat products (style and/or format)	Distribution channels
고기대신	Better Than Meat (ALTist)	Nuggets, cutlet, steak, Tteokgalbi (short rib)	Instore retail Online retail
britebelly	BriteBelly	Tteokgalbi, BBQ steak, meat dumplings, meatballs, burger	Foodservice Instore retail Online retail
DEVOTIONFOODS	Devotionfoods	Burger patty, mince - using proprietary technology leading to plant-based meat products with higher protein content than conventional meat	Foodservice
MEAT ZERO 미트제로	Meat Zero (Daesang)	Dumplings	B2B
UNTUNA	Untuna (Ottogi)	Canned tuna	Instore retail Online retail

Domestic brands		Plant-based meat products (style and/or format)	Distribution channels
PlanTable	PlanTable (CJ CheilJedang)	Dumplings, teokgalbi, short rib patty, burger	Instore retail Online retail
Pulmuone	Pulmuone	Mince, chicken tenders, Korean-style dishes	Instore retail Online retail
삼육식품 Sahmyook	Sahmyook	Burger, sausage, strips	Online retail
SOY MARU VEGAN FOOD	Soymaru	Bulgogi, steak, strips, cutlet, burger, nuggets, ham	Foodservice Instore retail Online retail
UNLIMEAT	Unlimeat (Zikooin)	Slices (BBQ and Plain), burger, mince, dumplings, pulled pork, jerky (using upcycled grains)	Foodservice Instore retail
VEGEFOOD EST.1998	Vegefood	Jerky, sausage, strips, steak, patty, cutlet, nuggets, local dishes (such as Bulgogi	Instore retail Online retail
Veggie garden	Veggie Garden (Nongshim)	Grilled steak, meatballs, mince, patty, Korean cuisine alternatives (such as tangsuyuk (sweet and sour pork)	Instore retail Online retail
ZERO MEAT	Zero Meat (Lotte Foods)	Burger, cutlet, nuggets	Instore retail Online retail

The above is not a complete list of every available brand.

Table 2: International plant-based meat brands sold in South Korea, at May 2022

International brands		Plant-based meat products (style and/or format)	Brand Origin	Production	Distribution channels
	Alpha Foods	Nuggets	United States	Imported	Online retail
	Beyond Meat	Beef, sausage, burger	United States	Imported	Instore retail Online retail
	Omni (Green Monday)	Mince, strips, luncheon meat	Hong Kong	Imported (Thailand)	Foodservice Online retail
	Sweet Earth (Nestlé)	Burger	Switzerland	Imported	Foodservice
	v2 (v2food)	Burger	Australia	Imported	Foodservice

The above table is not a fully comprehensive list of brands.

Cellular agriculture companies

Food made using cellular agriculture technologies are not yet approved for sale in South Korea. South Korean universities are driving innovation in the cultivated meat space, with researchers from Sejong University producing South Korea's first pork and beef. Universities are also collaborating with domestic start-ups (for example, Space F and Seoul National University), for the potential commercialisation of cultivated meat.[29]

Local start-up CellMEAT, which developed the world's first cultivated dokdo shrimp prototype, is looking to commercialise cultivated shrimp and branch into other types of cultivated seafood.[30] Another local start-up, SeaWith, is also developing products for commercialisation in the coming years after testing its cultivated beef in a tasting event in May 2021.[31]

Foreign cultivated-meat companies are also present in South Korea. Aleph Farms recently established a partnership with a large Korea-based food company, CJ CheilJedang, to support its plans to scale up and expand into the APAC region.[32] Other companies are also establishing international partnerships to access the region. Table 3 outlines some of the key cellular agriculture companies operating in South Korea in 2022.

Table 3: Cellular agriculture companies with operations in South Korea, at December 2022

Companies		Location	Area of focus	Approximate disclosed funding (USD)
CellMEAT	CellMEAT	South Korea	Vertically integrated	4.50 million
CJ CHEILJEDANG	CJ CheilJedang	South Korea	Precision fermentation	Revenue of KRW25.81 trillion (2021)
DaNAgreen	DaNAgreen	South Korea	Scaffolding	-
Noah Biotech	Noah Biotech	South Korea	Vertically integrated cultivated	-
seawith	SeaWith	South Korea	Vertically integrated cultivated	5.6 million

Product formats

Inspired by traditional South Korean meat dishes, domestic plant-based meat brands are emerging as market leaders with product innovations mimicking South Korean traditional meat dishes prepared using specific local cooking techniques and traditional flavours.

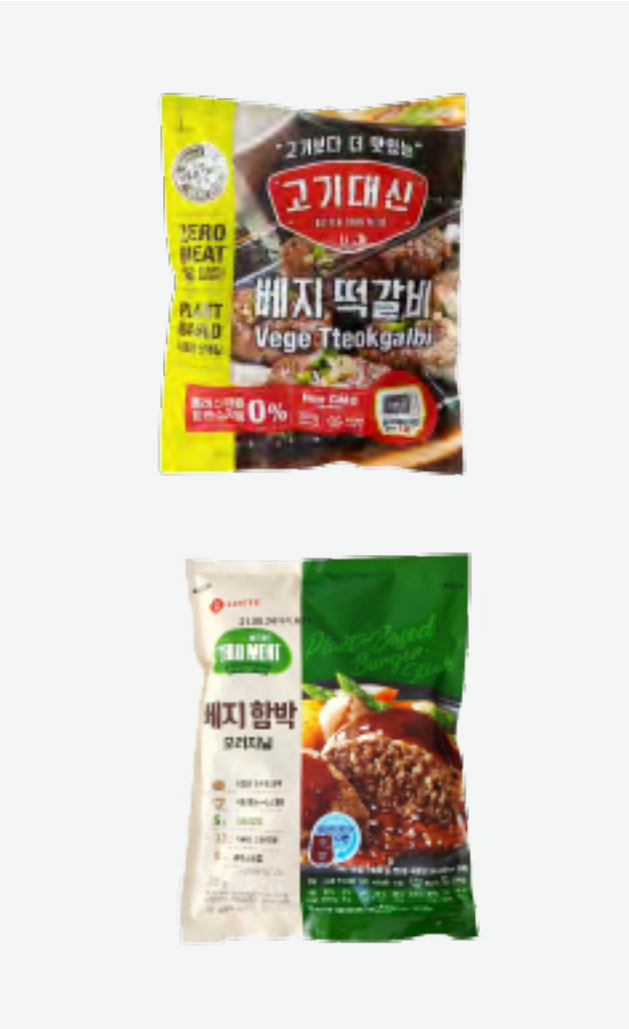
Beyond the growing availability of plant-based meat ready meals in the South Korean market, consumers can now also choose meal kit products designed as convenient options for those who prefer to make freshly cooked meals at home. A major South Korean meal kit provider, Fresheasy, has partnered with v2food to incorporate plant-based meat into its meal kit offerings.

Local establishments offer fusion and international cuisine experiences in South Korea, innovating with plant-based menu items inspired by international or fusion cuisines. For example, Plant Café and Kitchen recently began serving Greek-style Gyro Pitas with sliced marinated soy meat filling and Chelo Kebab featuring smoked soy meat kebab served with basmati rice, saffron-infused butter and fire-roasted veggies as a chef's special menu item.[33]

International brands (such as Domino's Pizza) introduced five plant-based pizzas made in partnership with Unlimeat. The plant-based versions included a newly created menu item, the Plant-Based Meat Signature Pizza, which featured Unlimeat's plant-based meat slices with other flavourings and toppings. The other Domino's products included plant-based adaptations of existing classic pizzas—Korean Sweet Potato, Hawaiian Shrimp, Super Deluxe and Super Supreme—which offered the option of swapping the meat topping for plant-based meat.[34]

In the past few years, companies have been launching plant-based versions of uniquely prepared meats such as Bulgogi—marinated barbecued meat slices (see case study on page 8); ALTist Better Than Meat Vege Tteokgalbi—marinated ground beef-style short ribs made with soy and wheat protein (bottom right); and Lotte Foods Zero Meat Original Veggie Hamburger Steak—round burger patty made from soy protein, served with savoury and tangy sauce (top right).

Figure 7: ALTist and Lotte Foods products



Price

Unlike some other Asian markets included in this study, the price premium of plant-based meat products in South Korea is only slightly higher than their meat equivalents, although South Korea also tends to have high conventional meat prices as Table 4 shows.

Industry interviews indicate that the plant-based meat price premium used to be driven by imported brands (such as Beyond Meat). However, this premium has recently declined due to the large number of local companies entering the market, although economies of scale have not yet been realised, and may bring prices down further.

South Korea's heavy reliance on imported food, especially conventional beef and pork products, is among the key contributors to high conventional meat prices in the country.[35] The low price gap between plant-based meat and conventional meat in the market increases the attractiveness of plant-based meat products, especially among consumers who are price-conscious, favouring the future growth of the category.

Half of South Korean consumers claim that they are willing to pay the same price for plant-based meat compared with conventional meat/seafood, which allows plant-based meat to be competitive with conventional meat. Those who are willing to pay more for plant-based meat compared to conventional meat/seafood tend to be more engaged with the category, having consumed plant-based meat in the past six months (37%).

Table 4: Price comparisons, selected plant-based meat products

Product format	Average price per 100g of locally produced plant-based meat	Average price per 100g of conventional meat	Price premium for plant-based meat in comparison to conventional meat	Total pack size of plant-based meat
Chicken-style, crumbed	USD2.25	USD1.80	**25%**	200-360g
Burger	USD2.26	USD2.53	**-10%**	175-480g
Pork-style, strips	USD2.32	USD2.23	**4%**	165-500g
Ready meals, meal kits	USD2.02	USD1.63	**24%**	169-596g

Source: Mintel Global New Products Database.

Partnerships

International brands in South Korea seek partnerships with local foodservice players to access the market and service local demand.

For example, US-based Beyond Meat has partnered with Dongwon F&B to distribute its product in the market,[36] while Nestlé's Sweet Earth brand from Switzerland partnered with Lotteria foodservice to sell its 'Sweet Awesome Burger'.[37] However, more progress to meet consumers' taste, quality and price expectations is required for the expansion of consumer demand.

Franchise restaurants are said to incorporate plant-based products as a token rather than for real profits, according to local industry interviews. For instance, Subway and Lotteria have launched products using plant-based meat, but most of them have been discontinued. There seems to be a pattern of products being launched and then discontinued due to poor sales.[38]

The strong competition from local players is a key obstacle for exporters looking to enter the market.[39] Local industry interviews suggest that international brands should look to collaborate with domestic distributors or manufacturers, which they can do through several mechanisms. First, through the supply of products made with Australian or New Zealand ingredients, which can carry a 'clean and green' association. Second, by developing private label products in collaboration with major distributors (such as Emart and Coupang). Third, by participating in product development in affiliation with major food companies that are yet to develop their own products.

Manufacturing and sourcing

South Korea is heavily dependent on imports to meet its food and agricultural needs, with domestically produced foods accounting for only 45% of its total annual food demand. According to industry experts, most of the ingredients for plant-based protein (such as textured vegetable protein and vegetable protein isolate) are imported because local production is insufficient and plant protein fractionation capacity is lacking compared to other international markets. The lack of investment into production facilities is said to be due to the low profitability, compared to the costs of importing ingredients, rather than to a skills or labour deficit.[40]

South Korea has a well-established food processing industry with over 30,000 food processing companies and USD56 billion in revenue in 2020. South Korean companies rely heavily on imported ingredients and commodities, presenting an opportunity for imported agricultural goods, including ingredients used in plant-based meat.[41] Plant-based meat co-manufacturing services are available in this market: for example, local company Soymaru co-manufactures for large companies and start-ups.

Ingredients

In South Korea, imported ingredients from the US, Australia and Brazil are considered far superior in terms of cost, production volume and consistency of quality compared to local ingredients.

Soy, pea, bean and wheat protein are the most commonly used protein ingredients in plant-based meat, while some plant-based chicken products are made with mushrooms.

South Korean plant-based meat business Unlimeat uses soy, chickpea, and lentil protein in its products and also incorporates upcycled grains, oats and nuts that would have otherwise been discarded due to their cosmetic imperfections. The Lotteria plant-based burger patty is made of wheat and beans, while Burger King's plant-based Whopper uses a soy-based patty from Australian company v2food.[42] Both the PlantTable and Pulmuone local brands also use soy protein in their products,[43] while Veggie Garden V-MINCE products use pea protein.[44]

Investment

There have been considerable efforts made by both the public and private sectors to drive growth in South Korea's alternative proteins market.

Zikooin Company, which owns Unlimeat, South Korea's leading plant-based meat brand made from upcycled food waste, received investments totalling USD23 million in 2021. Part of this will enable the construction of one of Asia's largest plant-based meat factories at nearly 9,000 square metres.[45] More recently in May 2022, Unlimeat launched its plant-based jerky range in the US via a Kickstarter crowdfunding campaign. The range sold out in South Korea shortly after its initial launch in April 2022.[46] Seoul-based plant-based meat start-up Viomix Tech raised USD15 million in September 2021 from domestic and international backers.[47]

Local start-up Intake is tapping into the South Korean market gap for whole-cut plant-based meat formats (such as pork belly), given the market has primarily been focused on beef-style products and processed meat formats like sausages and burgers. Intake is receiving support from Korea's Ministry of Agriculture, Food and Rural Affairs for collaborative research with the Seoul National University, Kyonggi University, and Ewha Womans University to develop plant-based ingredients that can emulate the experience of cooking and eating conventional pork belly and neck. The company is wrapping up a Series B funding round after investing more than USD3.8 million in plant-based meat developments over the past three years.[48]

In the cultivated meat domain, South Korean companies are seeking to increase scale and reduce costs. SeaWith raised a USD5.43 million Series A investment in February 2022 for cultivated meat production using non animal algal based growth medium, claimed to deliver cultivated steak at USD3/kg by 2030.[49] CellMEAT closed a USD8.1 million Series A funding round in April 2022 to continue to develop its cultivated shrimp prototype and scale up production to 10 kg/day, as well as develop cultivated crab and lobster.[50] Meanwhile, South Korea-based start-up Space F secured USD15 million in government funding in May 2022 to further develop cultivated meat production equipment, which will support commercialisation efforts.[51]

Regulatory and trade overview

South Korea's regulatory environment is considered favourable in measures of ease of doing business, and a positive policy agenda. Some industry experts point to an environment of large food companies making significant investments in plant-based and cellular food innovation.

The Ministry of Food and Drug Safety (MFDS) announced in January 2023 that the authority was working towards the establishment of legislation for alternative proteins, including definition, specification, labelling and more, as well as safety assessment of technologies like cultivated meat, to be implemented in 2024. MFDS released a draft amendment of the Food Code to establish a specific food standard regulating alternative protein foods for public comment during February.[52] MFDS also announced that new food additives standards applying to foods produced by using new technology, including alternative protein foods, will be developed.[53]

Public-private partnerships will further strengthen the cultivated meat ecosystem with the formation of an industry, research and local government cellular alliance in March 2023 and the opening of the nation's first Cellular Agriculture Industry Support Centre in North Gyeongsang Province, which opened later in the same month.[54, 55]

Some industry experts interviewed as part of this research are optimistic that, after Singapore, South Korea will be the next Asian market to move ahead in regulations around alternative proteins (such as cultivated meat) due to the combination of positive investment sentiment, government enthusiasm, and recognition of food security needs.

Trade agreements

South Korea's trade arrangements are favourable towards Australia and New Zealand. Australia's free trade agreement with South Korea (KAFTA)[56] gives exporters tariff-free access to agricultural and manufactured goods, while New Zealand's free trade agreement with South Korea (KNZFTA)[57] means 98% of goods exported to South Korea are tariff-free. Australia and New Zealand also benefit from multilateral agreements, including Regional Comprehensive Economic Partnership (RCEP) and the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP); South Korea will apply to join the latter soon. However, exporters should keep in mind that tariffs and duties are frequently reviewed by the government and are subject to change without notice.

Definitions and classifications

Table 5: Regulatory definitions and classifications

	Definition
Alternative protein	No specific definition.
Plant-based meat	No specific definition.

Table 6: Permissibility of standard foods and alternative proteins

	Relevant permissibility mechanism
Ingredients approved for food products	Must be listed in the Food Code or Food Additives Code. It is not permitted to use any ingredient without a significant history of consumption in South Korea. Alternative proteins, including mycoprotein or cultivated meat, are not specifically listed in any food regulations and are not permitted, as none are defined in the legislation/codes.
Unapproved ingredients	Permission Standards of Temporary Standards and Specification of Foods under the Food Sanitation Act defines the type of foods and the procedure to obtain permission for temporary standards and specifications if a company wishes to use the novel ingredient which is categorised as any of the below: • food raw materials / ingredients • raw materials (e.g. agricultural products, livestock products, fishery products, microorganisms, etc.) that have not been used in South Korea • ingredients that are obtained using extraction, concentration, separation, culture, etc., from agricultural products, livestock products, fishery products, etc. • food additives • additives that are not laid down by Food Additives Code • GMO-derived food additives which are imported, developed or manufactured for the first time • livestock products that do not have manufacturing standards and component specifications. If a company wishes to use a novel ingredient within the aforementioned scope, the company must obtain permission for temporary standards and specification for the novel ingredient in accordance with Permission Standards of Temporary Standards and Specification of Foods.

	Relevant permissibility mechanism
Cellular agriculture	There is no specific legislation that outlines provisions concerning cellular agriculture technologies. However, some new food processing / manufacturing technologies can be assessed through the procedure for temporary standards and specification of a novel ingredient in accordance with Permission Standards of Temporary Standards and Specifications of Foods (e.g. ingredient obtained using nano-technology). Genetic engineering techniques will be subject to GM legislation.
Final product containing alternative proteins	No specific compositional standards are established under the Food Code. Composite processed products containing meat substitutes/analogues as ingredients fall under the scope of relevant conventional food standards under the Food Code depending on the factors (such as predominant ingredients, state and physical forms of the products and the manner of consumption). If the products do not fall under any established food standards in the Food Code, there is a section 24-2 'other processed products', which may cover the composite products of interest.
Genetically modified (GM) products	Several regulations on the genetic modification of agricultural crops, livestock and general food (e.g. safety assessment of GM foods, testing methods) and labelling standards of GM foods in South Korea. GM materials are subject to pre-market authorisation procedures.

Table 7: Labelling regulations

	Legislation
Alternative proteins	No specific legislation. Horizontal labelling requirements for foodstuffs will apply.
Foodstuffs	Food Labelling Standard. Enforcement Decree of Act on Labelling and Advertising of Foods. Standard for Determining Unfair Labelling and Advertising of Foods.
Ingredients	No specific labelling requirements. Product naming requirements apply to ingredients.

	Legislation
Country of origin	Notification of Labelling Regulation Management of Country of Origin. Country origin declaration is mandatory for imported foodstuffs; the name of the country (e.g. Japan, UK) or self-governing region (e.g. Hong Kong, Guam) shall be used. The name of any regional or economic union (e.g. EU, ASEAN, NAFTA) is not allowed to be used as the country of origin.

Table 8: Naming regulations

	Requirements
'Meat' or the corresponding word meaning conventional 'meat' in the Korean language 육 (yuk) or 고기 (gogi),	Food Labelling Standard. The name must not be changed to imply any other meaning beyond the original meaning, unlike English (e.g. vacon for vegetarian bacon, vEEF for vegetarian beef). For example, brands should use a prefix to qualify that the product is a plant-based version of bacon. The Food Labelling Standard does not explicitly restrict or prohibit the use the words for conventional meat (e.g. 육 (yuk) or 고기 (gogi)) and other product names for the meat equivalents (e.g. meatball and hamburger in Korean) in labelling including product name and product claims for alternative products. The Korean words for conventional meat 육 (yuk) or 고기 (gogi) or other product names for the meat equivalents may be used together with descriptive words (e.g. plant-based, vegetarian in Korean) to reflect the product is a plant-based alternative.

Table 9: Claims regulations

	Legislation
Nutritional claims	Food Labelling Standard. Only listed nutrition claims are permitted for use. For example, for trans fat, only claims 'low' and 'reduced' or terms with similar meaning are permitted, whereas absence claims (such as 'no') is not permitted for trans fat. There are specific rules relating to 'no sugar' claims.

	Legislation
Health claims	Regulations on Function Labelling or Advertising of Foods which are Not Considered as Unfair Labelling or Advertising. Enforcement Decree of Act on Labelling and Advertising of Foods. There are specific rules relating to the use of superfood, glycemic index or glycemic load since those terms do not have a clear definition and are not backed by objective and scientific evidence.
Marketing claims	There are no specific provisions on marketing claims other than such claim should be truthful and not misleading or deceptive or is likely to create an erroneous impression regarding its value, merit or safety. Standard for Determining Unfair Labelling and Advertising of Foods lays down the general rules for non-misleading claims, with examples of misleading claims.
Allergen claims	For absence claims for allergens (e.g. no nuts), it is understood the information under the section 'Absence / non-additional claims for additives or bulk ingredients' applies. There are no specific provisions laid down to address the use of absence claims for ingredients under the current labelling legislation; the general truthful and non-misleading principles apply. For allergens, the claims 'low' or 'reduced' would not be acceptable.
Gluten-free claims	Appendix 2 of Labelling Standard for Consumer Safety from Enforcement Rule of Act of Labelling and Advertisement for Foods.

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Japan

Summary

Japan has one of the largest economies in the world. While it is considered a high-income country by the World Bank, consumers are price-sensitive while valuing quality and innovation. Japan is ranked thirtieth globally by the World Bank for ease of doing business and is ranked third among the five countries included in this report.

Traditional cuisine washoku is heritage-listed by UNESCO in recognition of both the traditions and ingredients of Japanese food. Strong meat and seafood eating dietary preferences, a desire for a varied diet with grains and vegetables, a relatively low desire to reduce meat intake, and less acceptance of plant-based foods characterise the Japanese market. Australian and New Zealand exporters can leverage an increased desire for convenience with Western-style products through foodservice and convenience retail channels, providing offerings that meet taste expectations and are easy to prepare.

The Australia-Japanese partnership is Australia's closest and most mature relationship in Asia and is fundamental to both countries' strategic and economic interests. The nations share a Special Strategic Partnership and cooperate closely in several multilateral political forums as well as economic partnerships.[1] Similarly, New Zealand has strong political ties with Japan, sharing substantial trade, economic, tourism, science and people-to-people links.[2]

Due mostly to the lower CAGR prediction of 9% to 2027, Japan is the fourth most favourable market for plant-based meats in Asia. The volume of meat substitutes sold in retail reached 12.6 million kg in 2022, an equivalent consumption of 0.1 kg per capita.[3] With a 9% CAGR predicted between 2022 and 2027, volumes are projected to reach 24.4 million kg by 2027.[4]

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Market landscape

Socio-economic and cultural factors

Japan is one of the largest economies in the world. In 2022, its GDP reached USD4.2 trillion, third to the United States and China.[5] Japan was one of the first countries in Asia to advance its value chain from cheap textiles to advanced manufacturing and services. Today, this accounts for the majority of its GDP and employment, while primary industries, including agriculture, account for just 1%.[6]

Agriculture was an integral part of Japan's economy in the early 20th century. As the farming population aged and farmland made way for urbanisation, Japan now relies significantly on food imports and the remaining agricultural sector is heavily protected.[7] In 2022, the government of Japan introduced funding and regulatory support to increase food security by promoting wheat and soybean production.[8]

Japan's economic recovery following COVID-19 is strong and the International Monetary Fund says the country's economy is growing at its fastest rate in twelve years.[9] While this strong economic outlook is credited to deliberate policy support, high vaccination rates and pent-up consumer demand, Japan also faces structural challenges, including supply chain impacts from the war in Ukraine, an ageing and shrinking population, stagnant productivity and climate change risks.[10]

Japan is classified as a high-income society where quality and innovation often appeal to consumers, making it potentially receptive to plant-based meats.[11] Demand for food and beverages with high protein content has gained greater momentum since 2018 when the Japanese Government increased its recommended protein intake for seniors to help prevent ageing-related health issues.[12] While Japan has a long history of eating traditional plant proteins derived from soy (such as tofu, miso and natto)[13], the concept of a balanced diet containing various food groups (such as fruits, vegetables, dairy, grains and particularly meat) has a significant influence on the eating habits of Japanese consumers, suggesting they are unlikely to completely replace conventional meat with plant-based meats.[14]

Food in Japan is an important part of history and modern society. Traditional Japanese cuisine washoku is recognised by UNESCO as Intangible Cultural Heritage. This recognition is about more than the food itself, extending to the presentation, traditions and ingredients that go with it. For example, the foods served at new year celebrations all have a symbolic meaning that represents success for the year to come. UNESCO also recognised the sense of social cohesion fostered by Japanese foods, and its focus on healthy eating.[15]

A typical Japanese meal is usually composed of a main dish (protein-based) and four elements which tend to include a variety of vegetables, rice, soup, side dishes and pickled vegetables. Common dishes in Japan include sushi, sashimi, tempura, udon and ramen. Given the current consumer desire to include meat as part of a balanced diet, plant-based meat could be positioned as a cost-effective and healthy meal element alongside existing meal components rather than as a substitute for meat, helping normalise it as another protein option.

Given the current consumer desire to include meat as part of a balanced diet, in the first instance plant-based meat could be positioned as a cost-effective and healthy meal element alongside existing meal components rather than as a substitute for meat, to allow consumers to become familiar with plant-based meat.

Retail and foodservice landscape

Japan's food and beverage retail sector comprises supermarkets, department stores, convenience stores, drugstores and e-commerce. The total retail sales generated by food and beverage in Japan in 2020 was USD474.13 billion, of which supermarkets represented 73% of sales, followed by convenience stores with 14%.[16]

The dominant supermarket chains are AEON Retail, Ito Yokado, Life Supermarket and Seiyu. Specialty supermarkets carrying exclusive imports include Kinokuniya, Meidi-ya and Seijo Ishii. Drugstores and e-commerce sales of food and beverages are gradually increasing. The convenience store channel, led by 7-Eleven, Lawson and Family Mart, is highly competitive, making it difficult to gain and retain shelf space.[17]

Plant-based meats are in a range of channels across Japan, including supermarkets and convenience stores. In 2020 Japan's leading convenience stores introduced ready meals (such as plant-based burgers and pasta with sauces made with plant-based meat). Ready meals are showing high growth and convenience stores are leveraging plant-based meat in their marketing initiatives.[18] Industry experts point out that convenience stores occasionally run promotions for plant-based meat, but supermarkets rarely do.

Japan's foodservice sector generated USD239.1 billion in sales in 2020 and is seen as a key channel to increase consumers' exposure to new products. Leading the sector with 28% of sales was takeout, which includes ready-to-eat meals sold in Obento (lunch box) shops, convenience stores, supermarkets and department stores. Restaurants comprised 18% of sales, institutional foodservice 15%, and fast-food 12%. This data is likely to be influenced by COVID-19 lockdowns which required food to be taken away. Other smaller foodservice segments included pub dining and drinking venues, which comprised 10% of sales, hotel restaurants 8%, coffee and tea shops 4%, and food delivery 3%.[19]

Foodservice has been a significant contributor to Japan's increase in plant-based meat offerings and plays an important role in raising awareness and consumer trials and several brands have been featured on fast-food and coffee chain menus since 2020. Most international plant-based meat brands entering Japan are focused on access via foodservice (such as Dutch company The Vegetarian Butcher and Australian company v2food). Quick service restaurants (QSRs) regularly launch and promote plant-based menu items (such as Burger King's plant-based Whopper) using Australian brand v2foods' patty. Mos Burger, Japan's largest domestic burger chain, and another domestic chain, Freshness Burger, have both launched burgers featuring soy-based meat patties.

There are opportunities for plant-based meat integration into Japanese fast-casual restaurant chains with meatless offerings replacing conventional meats. For example, the Japanese-style barbecue chain Yakiniku Like collaborated with Next Meats to supply harami (skirt steak) and karubi (short rib) plant-based meat dishes alongside conventional meat dishes.

Interviews with local industry experts reveal that plant-based meat foodservice offerings typically lean towards temporary or seasonal menu items rather than permanent menu fixtures. In 2019, there was a sudden increase in the popularity of halal food, along with vegetarian and vegan options, which led some foodservice outlets to have permanent plant-based meat offerings in certain locations. Some permanent menu items were paused as COVID-19 started to impact Japan, and some QSRs (like Mos Burger and Freshness Burger) have kept plant-based meats permanently on menus.[20]

Ready meals are showing high growth and convenience stores are leveraging plant-based meat in their marketing initiatives. Industry experts point out that convenience stores occasionally run promotions for plant-based meat, but supermarkets rarely do.

Consumers

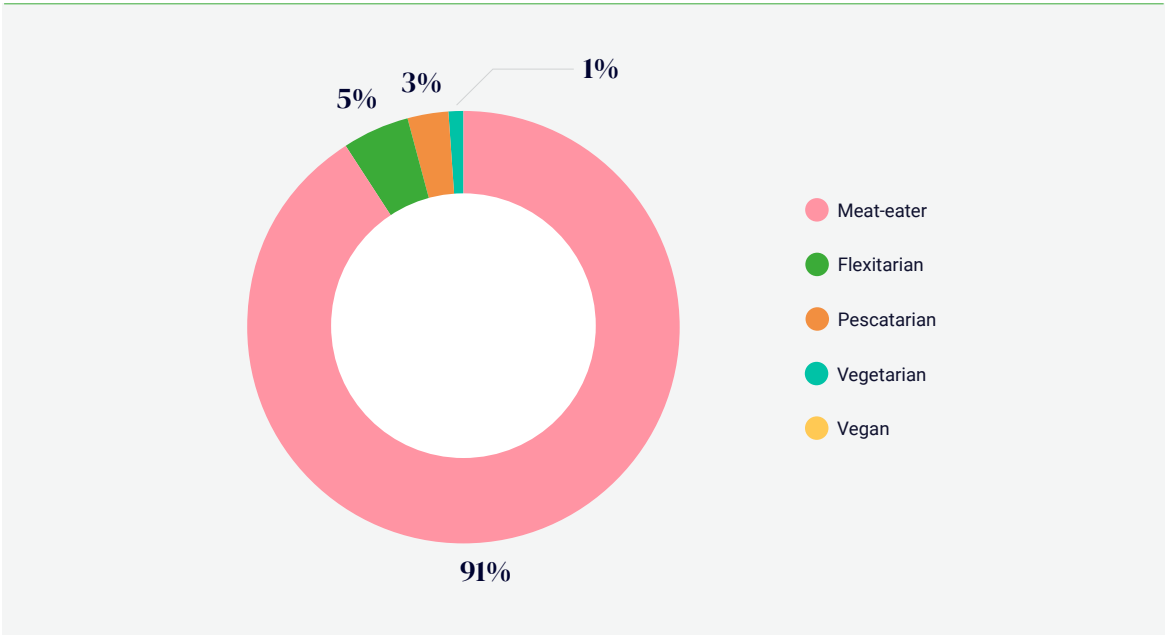
Dietary preferences

Japan is a meat-eating nation, and there is currently a low desire to reduce meat consumption.

Ninety-one percent of Japanese surveyed identified as meat-eater, while only small percentages identified as pescatarian, flexitarian, vegetarian and vegan, as Figure 1 shows.

There was a significant difference, albeit low at 8%, in consumers aged 55 and over and eco-conscious and organic identifying as flexitarians. Seven percent of consumers plan to eat less of at least one type of meat in the next six months. The intent to reduce red meat is slightly higher, at 5%, compared to poultry and fish/seafood at 2%.

Figure 1: Dietary preferences



Base: 1,000 internet users aged 18-45+
Source: Rakuten Insight/Mintel.
Meat-eaters eat red meat or poultry.
Flexitarians eat plant-based options at some meals, replacing red meat, poultry, fish/seafood, eggs or dairy.
Pescatarians eat no red meat or poultry but eat fish/seafood, dairy and eggs.
Vegetarians eat no red meat/poultry or fish/seafood but eat dairy and eggs.
Vegans eat no animal products.

> **The main difference between Japan and overseas markets is plant-based meat in Japan is merely an "alternative" meat, while plant-based meat brands overseas aim to replicate animal meat and market themselves as providing the same experience as "real meat". Japanese brands' attitude is to present plant-based meat as a complement instead of a substitute for animal meat, and Japanese consumers do not seem to be ready to accept them as "real meat" either.**

Mr Takao Yamamoto
Senior Officer at Miyoshi Oil & Fat Co.

Plant-based meat consumption

Nine percent of Japanese have eaten plant-based meat either at home or at restaurants/food outlets in the past six months.

Consumption of plant-based meat is significantly higher in 18–24 year olds at 17% compared to 9% across all age groups. Although not statistically significant, there is a trend toward higher consumption among consumers with an income above JPY 10,000,000 (about USD76,183) as Figure 2 shows.

Figure 2: Plant-based meat purchase and consumption, by demographic

Base: 1,000 internet users aged 18-45; 950 internet users aged 18-45+ who shop for groceries in the household.
Source: Rakuten Insight/Mintel.

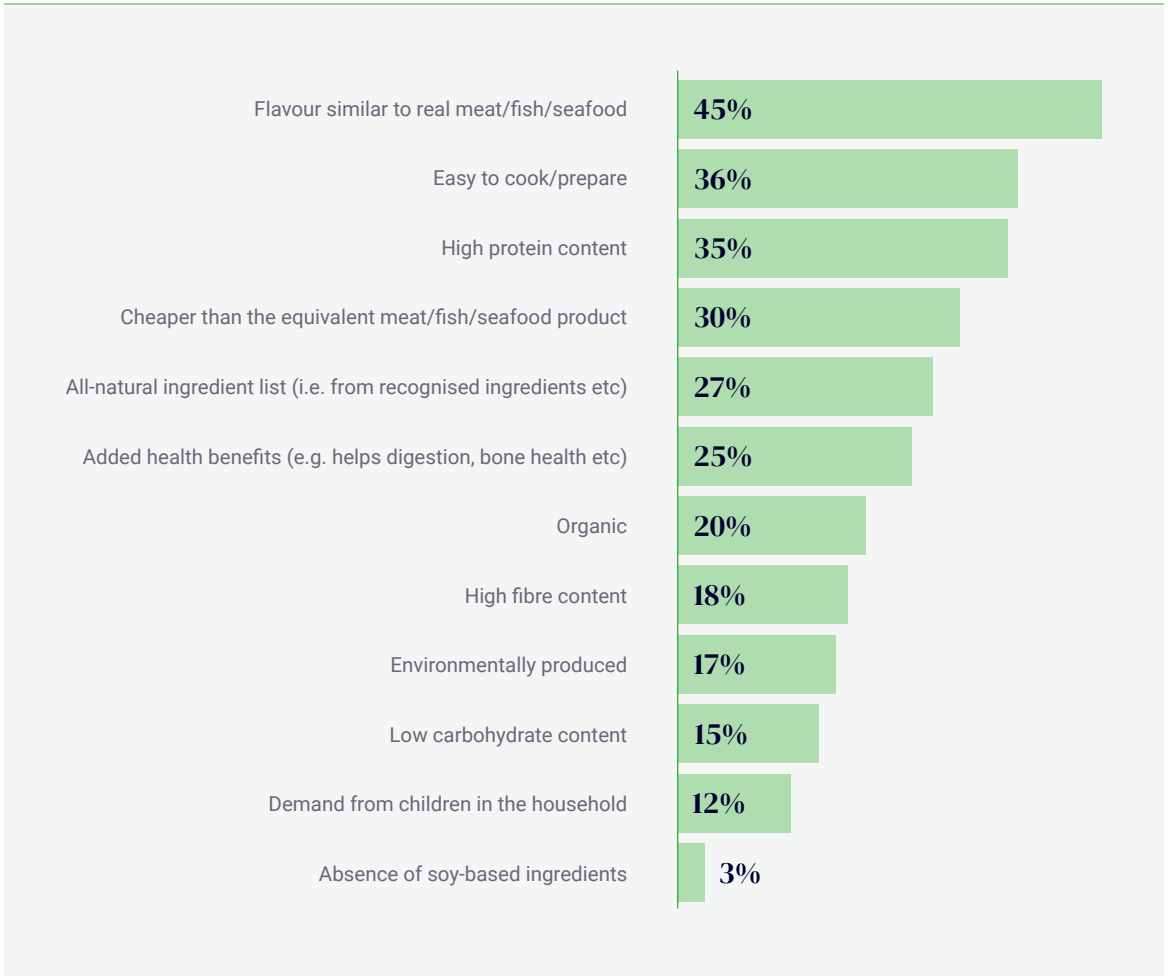
▲ Significantly higher than total at 95% confidence interval. ▼ Significantly lower than total at 95% confidence interval.

Drivers

When shopping for plant-based meat, meat-like flavour (45%), convenience (36%), protein content (35%), and price (30%) top the list of most important factors for consumers, as Figure 3 shows. The research indicates that to reach over 80% of consumers, plant-based meat manufacturers should highlight taste, high protein, ease of cooking and health benefits while delivering value when compared to conventional meat.

The top drivers for consuming plant-based meats are improving overall health (46%), liking the taste (26%), adding more variety of proteins to their diet (25%), safety concerns including avoiding animal-borne diseases (22%), avoiding the cost of meat and seafood (19%) and environmental concerns (18%).

Figure 3: Factors when purchasing plant-based meat products



Base: 398 plant-based meat buyers aged 18–45+ who would consider purchasing again or non-plant-based meat buyers who would consider purchasing in the future.
Source: Rakuten Insight/Mintel.

Barriers

The biggest barrier to plant-based meat consumption is taste, as Figure 4 shows. Women are especially sensitive to the palatability of plant-based meats: 32% report taste as a barrier. This is followed by perceptions of it being too processed and a lack of availability.

Perceptions that plant-based meat is 'too processed' may also discourage consumers from eating plant-based meats in the future, especially with health being an important consideration in this market. Experimenting with a shorter ingredient label, looking for additives that have multiple benefits, or exploring different processing methods/ingredient descriptions (such as sprouted pulses) could help increase plant-based meat's 'natural' associations.

Japanese consumers are very price-sensitive about plant-based meats when comparing them to conventional meat and seafood. More than half claim they wish to pay less for them and 33% are willing to pay the same for plant-based meat relative to its conventional equivalent. Those who are willing to pay more for plant-based meat compared to conventional meat/seafood tend to be eco-conscious buyers (19%) and ethical buyers (21%).

Figure 4: Barriers to consuming plant-based meat

Base: 590 plant-based meat consumers aged 18–45 who would not consider consuming again or non-plant-based meat consumers who would not consider consuming the product in the future.
Source: Rakuten Insight/Mintel.

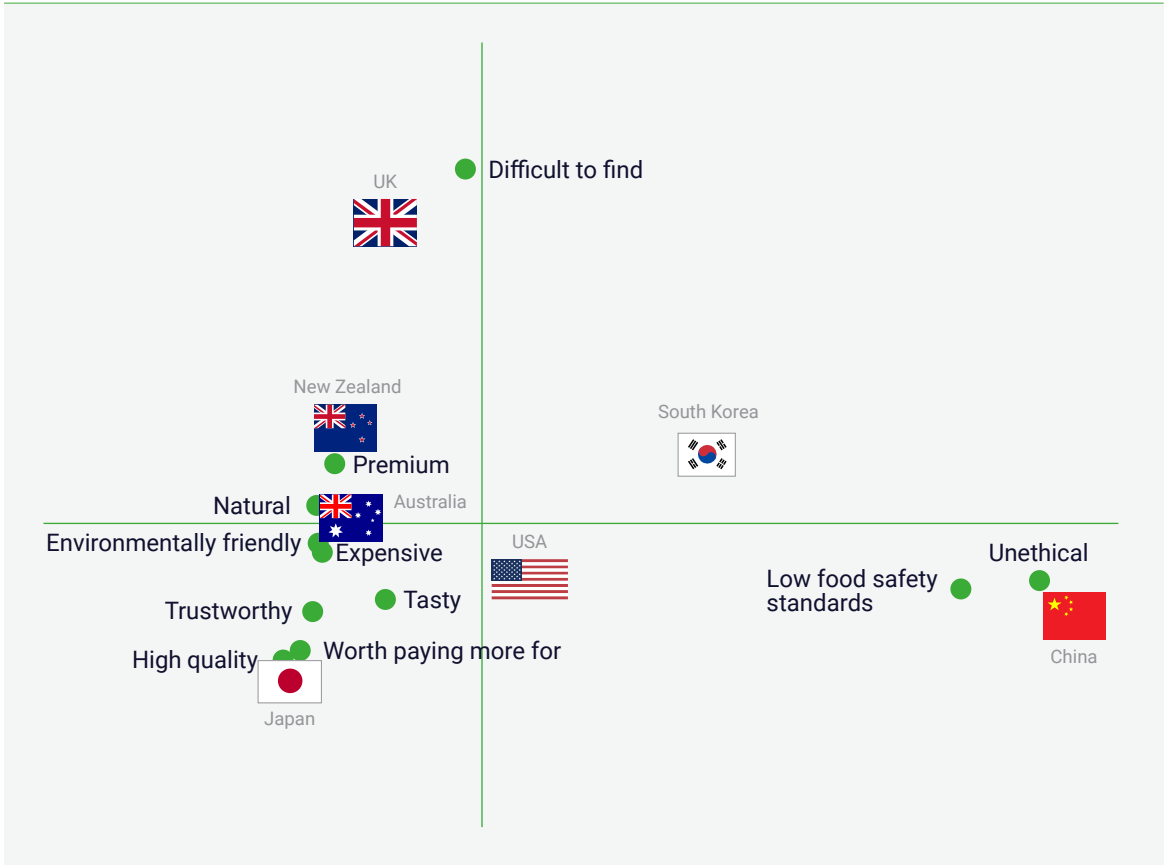
Country of origin preferences

Japanese consumers have a strong preference for local products,[21] viewing them as higher quality, better tasting, more trustworthy and worth a premium price.

Of the foreign countries analysed, Australia and New Zealand are perceived the most favourably and are associated with natural and eco-friendly attributes, but their relative premium perception also means their products are seen as expensive, as Figure 5 shows.

Products with British and Chinese provenance are perceived more negatively. The former is perceived as difficult to find, and the latter is perceived as unethical and having low food safety standards.

Figure 5: Perceptions of provenance



Correspondence analysis measures the relationship between and within two groups of variables and is used for perception measurement in market research. In this research, country perceptions were measured against the range of attributes represented in Figure 5. It is a statistical visualisation method for picturing the associations between rows (image, attitudes) and columns (brands, products, segments, etc.) of a two-way contingency table.
Base: 1,000 internet users aged 18+.
Source: Rakuten Insight/Mintel.

Place of purchase and frequency

There are important and significant differences between general Japanese consumers and plant-based meat consumers. Most general consumers prefer to shop in-store only (61%), with fewer using both online and in-store channels (39%), whereas plant-based consumers are likely to use both online and in-store channels (51%) or all in-store (49%).

In Japan, supermarkets and hypermarkets (including department stores) are the most common general consumer channels for grocery shopping (96%), followed by drugstores (44%) and convenience stores (31%), with traditional/wet markets (20%) and natural supermarkets (4%) making up smaller percentages. Although also using supermarkets and hypermarkets (93%), plant-based meat consumers are significantly more likely to shop in drug stores (56%), convenience stores (42%), traditional markets (32%) and natural supermarkets (18%), suggesting a higher preference for fresh and natural foods.

Of the 9% of consumers who have consumed plant-based meat in the past six months, most of them (40%) consume plant-based meat on a weekly basis (up to six times a week), 18% consume plant-based meat 2–3 times a month, reflecting that consumers occasionally replace conventional meat with plant-based meats rather than strictly limiting themselves to plant-based meat. Five percent report eating plant-based meats daily.

Most consumers (34%) use traditional media, TV and radio, to source information about plant-based meat, particularly 55-year-olds and older. Food and beverage retailers (such as supermarkets and convenience stores are also key channels for plant-based meat information (30%), particularly for people over 55. Many, particularly 18-34-year-olds, also get information from social media (27%).

Consumer perceptions of cellular agriculture

At the time of publishing, cultivated meat and products of precision and biomass fermentation were not approved for sale in Japan. As discussed later in this report, there are a number of cultivated meat R&D projects and start-ups in the country and the Japanese Government is expected to review cultivated meat regulation in 2023.

Twenty percent of 1,000 Japanese surveyed were aware of cultivated meat. Two percent indicated they would definitely purchase it and 10% indicated they would likely purchase it once it became available.

The potential barriers are unfamiliarity with cultivated meat (46%), perceptions of it being unnatural (39%), taste concerns (32%), health concerns (26%), and assumed high prices (22%).

Awareness of products of precision and biomass fermentation is lower than cultivated meat at 11%, with 1% indicating they would purchase and 12% likely to purchase these products once they are available. The potential barriers to purchase are unfamiliarity with precision fermentation (52%), taste concerns (31%), perceptions of unnaturalness (29%) and health concerns (24%).

Cultivated meat and products of precision and biomass fermentation are highly associated with being environmentally friendly and unique, and many Japanese consumers indicated they are open to trying new experiences.[22] Awareness about the safety of these technologies, their novelty, and contribution to food security could increase product appeal and encourage trials.

Twenty percent of 1,000 Japanese surveyed were aware of cultivated meat. Two percent indicated they would definitely purchase it and 10% indicated they would likely purchase it once it became available.

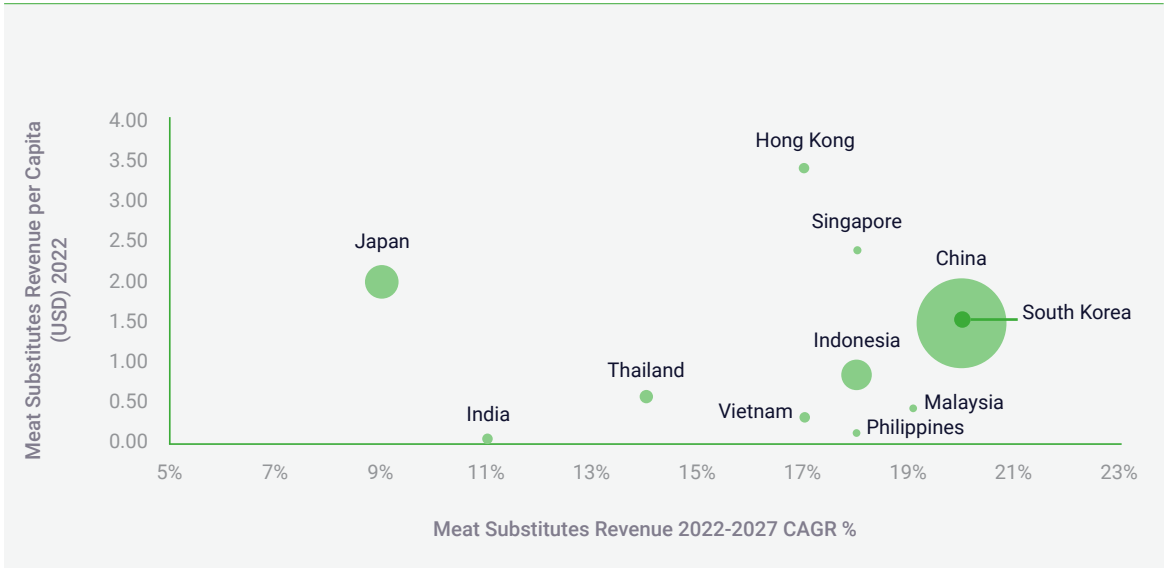
Alternative proteins landscape

Market size

The meat substitutes market in Japan was forecast to reach USD247.50 million in 2022. Compared to other Asian markets, Japan has a high revenue per capita (USD1.47), while the projected revenue growth between 2022 and 2027 is slower at 9% CAGR.

Japan's volume of meat substitutes sold through retail was forecast to reach 12.6 million kg in 2022, an equivalent of 0.1 kg per capita. With a 14% CAGR between 2022 and 2027, volumes are projected to reach 24.4 million kg by 2027,[23] as Figure 6 shows.

Figure 6: Meat substitutes market revenue size and growth, by selected Asian markets



Note the size of the bubble represents the total meat substitutes revenue (million USD) in 2022. As defined by Statista, the Meat Substitutes segment covers plant-based meat and mock meat.

Company representation

Table 1, Table 2 and Table 3 show a range of domestic and international alternative protein brands/ companies and organisations supplying plant-based meat or developing cellular agriculture products in Japan.

Development of the 'new generation' plant-based meat category has been led predominantly by domestic food manufacturers, including major meat processors, plant oil crushers and processors, frozen food manufacturers, health food manufacturers and many leading retail and foodservice chains. Domestic companies dominate the market, and some regional and international companies also sell products in Japan, as Table 1 and Table 2 show.

One of Japan's leaders in the plant-based meat market is Marukome, the country's leading miso paste manufacturer. Its brand DAIZ Labo offers more than 30 soy-based meat products.[24] Otsuka Foods' Zero Meat includes plant-based sausages, meatballs and burger patties made from soy and egg whites.[25] Japan's two leading conventional meat processing companies, NH Foods[26] and Itoham,[27] launched plant-based meat brands NatuMeat and Just Like Meat!, respectively. NatuMeat uses konjac, instead of soy, for a chewy texture.

Next Meats, a local brand that produces flavour-focused, plant-based versions of traditional Japanese dishes, is increasing its production scale with an eco-friendly facility built in 2022.[28]

Table 1: Domestic plant-based meat brands sold in Japan, at May 2022

Domestic brands		Plant-based meat products (style and/or format)	Distribution channels
DAIZ	DAIZ	Burger, chicken nuggets, gyoza dumplings, spring rolls	Foodservice Instore retail
ダイズラボ	DAIZu Labo (Marukome)	Burger, Soboro, Keema curry, Gyoza mix of soy meat	Foodservice Instore retail Online retail
Green Meat	Green Culture (Green Meat)	Steamed dumplings, potstickers, keema curry	Foodservice
KaRuNa	Karuna	Mince, tuna flakes, rib-style meat	Instore retail Online retail
Good for Vegans	Kurakon Foods	Chilli con carne, mince, burger mix, Keema curry	Instore retail Online retail

Domestic brands		Plant-based meat products (style and/or format)	Distribution channels
	Madurai Food	Burger, nuggets, Keema curry	Instore retail
	Marude Oniku (Itoham Foods)	Soy meat stir-fry, ham cutlet, nuggets, burgers	Instore retail
	NatuMeat (NH Foods)	Ham, meatballs, cutlets, nuggets, burgers, sausages	Instore retail
	Next Meats	Yakiniku harami (skirt steak), rukalbi (short rib), gyudon (meat over rice), shoga-yaki (ginger pork), burger patty, chicken fillet, tuna	Foodservice Instore retail Online retail
	Try Veggie (Prima Meat Packers)	Soboro, meatballs, burger, chicken, katsu, meatballs	Foodservice Instore retail
	Saniku Foods	Bologna loaf, sausage, keema curry, tuna, mince, ham (Daniel Labo)	Instore retail Online retail
	Zero Meat (Otsuka Foods)	Ham, burger, sausage, nuggets	Foodservice Instore retail Online retail

The above is not a complete list of every available brand.

Table 2: International plant-based meat brands sold in Japan, at May 2022

International brands		Plant-based meat products (style and/or format)	Brand origin	Production	Distribution channels
	Omni (Green Monday)	Pork, gyoza/dumplings, musubi, katsu	Hong Kong	Imported (Thailand)	Foodservice Instore retail
	Top Tier Foods	Wagyu (beef)	Canada	Domestic	Foodservice
	v2 (v2food)	Burger	Australia	Imported	Foodservice
	The Vegetarian Butcher (Unilever)	Meatballs, burgers, sausage, burger, fish, chicken nuggets	Netherlands	Imported	Foodservice

The above is not a complete list of every available brand.

Cellular agriculture companies

Food products made using cellular agriculture are not yet approved for sale in Japan. Compared with other Asian countries, Japan is one of the most advanced in cultivated meat development with a growing number of cultivated meat start-ups and research labs present. Nissin Foods Group (part of the Monde Nissin Group) began an ongoing partnership with the University of Tokyo in 2017, with the aim of cultivating whole-cut steaks, rather than the more common minced meat-style format of cultivated meat.[29] The partnership is aiming to establish the basic technology to produce a palm-sized cultivated steak product by 2025.

In 2021, Osaka University researchers used 3D bioprinters and bovine stem cells to reproduce Wagyu's distinctive marbling in a solid steak-like piece.[30] One of the Japanese pioneers in this area is IntegriCulture, which aims to democratise cell-culture technology with open-source resources (such as a DIY cell-culture manual).[31] IntegriCulture recently announced a breakthrough with its production of 'edible duck liver-derived cells' made only from food that utilises its unique culture technology.[32] Integriculture has partnered with Japanese food manufacturer NH Foods (which produces both conventional animal meat products and has also introduced plant-based meats) for R&D.

In March of 2023 Prime Minister Fumio Kishida announced plans to develop and support the domestic cultivated meat industry, with Japanese academic and corporate partners forming a new Consortium for Future Innovation by Cultured Meat to accelerate progress later the same month.[33]

There is also a range of precision and biomass fermentation start-ups in Japan, some of which are detailed later in this report, alongside investments shown in the cellular agriculture sector, disclosed investment in companies in Japan has exceeded USD142.6 million in total.

> **Japan has the optimal environment and resources for cultivated meat research. Japan is already ahead in regenerative medicine and research on muscle tissue. This nation boasts highly-advanced technology for building three-dimensional tissue outside the body. While research on cultivated meat is conducted all over the world, Japan's technological prowess offers an advantage in this field.**
>
> NISSIN Group[34]

Table 3: Cellular agriculture companies with operations in Japan, at May 2022

Companies		Location	Area of focus	Approximate disclosed funding (USD)
ALEPH FARMS	Aleph Farms (in partnership with Mitsubishi Corporation)	Israel	Vertically integrated cultivated	*
	Diverse Farm	Japan	Vertically integrated cultivated	-
IntegriCulture	IntegriCulture	Japan	Vertically integrated cultivated	10.20 million
NISSIN GROUP	NISSIN Group (in partnership with University of Tokyo)	Japan	Cultivated steak muscle fibres	*
NUProtein	NUProtein	Japan	Cell-culture media	1.00 million

*Because Aleph Farms is headquartered and based in Israel, its investment figures have not been added to the total investment figure for Japan.

Product formats

Plant-based meat has been incorporated into a range of cuisine types in Japan. Local formats and flavours occupy a fair share of products and many plant-based brands are innovating in trending regional cuisines from China, Korea and Thailand. Western dishes using plant-based meat (such as Italian-style meatballs, pasta dishes and stroganoff) can also be found in the market.[35]

Burger patties are the most common plant-based format launched by plant-based meat manufacturers (30%). These patties often come in Japanese burger style (known as hambāgu), which is typically mixed with panko breadcrumbs and sautéed onions and served with a tangy demi-glace sauce. Other common formats include nuggets (7–8%), meatballs, meat cutlets (7–8%), and ready meals.[36] Local brands dominate the market, and Western formats (such as burgers) are less popular with consumers, despite being readily available.

Chicken-style (crumbed) is the most purchased product format bought by plant-based meat consumers, followed by uncrumbed pork-style. Uncrumbed chicken-style, uncrumbed beef-style and plant-based mince are also purchased by approximately one quarter of plant-based meat consumers.

Industry experts claim there is room for more variety of plant-based formats to meet consumer demand[37] and there is evidence this is occurring with Next Meats Co. releasing its first plant-based canned tuna, Next Tuna, in October 2021. The brand emphasises the nutritional qualities, claiming to be "low in fat, contains zero cholesterol and is high in protein".[38]

The new Marukome range is another example of a company introducing more formats. It introduced the 'Carne Di Soia' range, which Figure 7 shows, in collaboration with a well-known chef, Mr Tsutomu Ochiai, the owner and chef of 'LA BETTOLA da Ochiai' restaurant. The range is made with soybean that is pre-seasoned to complement different types of cuisines and is available in Japanese-style meat chunks, western-style mincemeat and Chinese-style meat fillet.[39]

Figure 7: Carne Di Soia range

Price

Plant-based meats are generally more expensive than conventional meat equivalents in Japan.

The average price premium of plant-based meats can range between 14% and 41%. Ready meal formats have the least price difference at 14%. The average price of plant-based meatballs is 41% higher than their meat equivalents, followed by crumbed chicken-style (such as nuggets) and burgers at 30% and 17%, respectively. Many plant-based meat products are in single-portion pack sizes that typically weigh 60g to 200g.

Japanese consumers are very price-sensitive when it comes to plant-based meat, with more than half of consumers expecting to pay less for plant-based meat than conventional meat and seafood, while 33% are willing to pay the same for plant-based meat relative to its equivalent. Those willing to pay more than conventional meat/seafood tend to be eco-conscious (19%) and ethical buyers (21%).

Table 4: Price comparisons, selected plant-based meat products[40]

Product format	Average price per 100g of imported plant-based meat	Average price per 100g of conventional meat	Price premium for plant-based meat in comparison to conventional meat	Total pack size of plant-based meat
Burger	USD1.90	USD1.62	**17%**	67–300g
Chicken-style crumbed	USD1.93	USD1.48	**30%**	63–200g
Meatballs	USD2.09	USD1.48	**41%**	63–150g
Ready meals	USD1.65	USD1.45	**14%**	100–300g

Source: Mintel Global New Products Database.

Partnerships

Domestic and international partnerships are helping to drive the plant-based meat market in Japan in two ways: through the entry of new products via existing channels and new product innovation.

Multinational quick service restaurants, such as Burger King, have introduced plant-based products on their menu (including a partnership with Australian brand v2food), as have domestic QSRs (such as Mos Burger). International plant-based meat companies often partner with QSRs as a gateway to the Japanese market.

In the pre-commercial space, international and domestic partnerships are important in developing and scaling Japan's leading cultivated meat innovations. Cultivated meat pioneer IntegriCulture partnered with Singapore's Shiok Meats to scale the production of Shiok Meat's cultivated shrimp meat. Japanese cultivated meat start-up Diverse Farm developed a joint venture between Japanese Michelin star chef Shimamura and cultivated meat company TissueByNet to produce a menu of cultivated meat delicacies (such as roasted cultivated duck loin).[41] Israel's Aleph Farms and Japanese Mitsubishi Corporation announced in 2022 a partnership to bring cultivated meat to the Japanese market. Aleph Farms is contributing with its manufacturing platform to develop cultivated whole-muscle steaks, and Mitsubishi is using its capabilities in biotechnology processes, manufacturing and local distribution.[42]

BBQ steaks and ribs

Japanese-style barbeque restaurant chain Yakiniku Like, in collaboration with Next Meats, sells plant-based meat.

The meatless offerings are served in two styles: harami (skirt steak) and kalbi (short ribs), which are charcoal-grilled, similar to the conventional yakiniku meat dish. The menu states that the plant-based soy meat has a texture and taste exactly like animal meat.

Yakiniku Like promotes that the Next Meats 2.0 has one-eighth of the fat content of conventional grilled meat but contains more than double the protein content of conventional meat.

Next Meats 2.0 features in Yakiniku Like website and menu. **Source:** Yakiniku Like.

Manufacturing and sourcing

In 2020, Japan's food processing industry manufactured USD218.3 billion of food and beverage products.[43]

The country has a large reliance on imported food products, including ingredients, domestically producing only about 38% of total calories consumed, with imports from the US and Australia supplying 23% and 9% of total calories, respectively.[44]

In Japan, some brands do not own processing equipment, and they rely on suppliers, partners or co-packers to manufacture their products. For example, leading food and beverage company Otsuka Foods works with Starzen to produce its Zero Meat hamburgers.[45] Fuji Oil is Japan's largest soy protein ingredients company supplying food manufacturers across the country, including those producing plant-based meat.[46] Japan's largest chemical company, Shin-Etsu Chemical, is entering the plant-based meat market and developing a cellulose-based binding agent that can improve the texture and structure of plant-based meats for different cooking methods and can also replace egg white.[47]

Ingredients

Japan relies heavily on imports for ingredients used in plant-based meats. It imports 83% of wheat and 78% of soybeans used by the food industry annually. Japan is among the world's top 10 importers of soybeans, a traditional ingredient in Japanese cuisine and the main source of protein in plant-based meat in the market.[48]

With the plant-based meat sector gaining momentum, annual production of plant protein ingredients grew by 6% between 2019–20 but remained flat in 2021, reaching 50,503 metric tonnes, comprising 44,725 metric tonnes of soy protein isolates[49] and 5,778 metric tonnes of wheat gluten.[50]

Although the industry is mainly focused on soy for its high protein and low caloric profile, industry experts in Japan suggest there is potential to diversify the sources of protein in plant-based meat products with other ingredients (such as pea, mung bean and faba bean protein).

Mixing multiple ingredients, instead of just soy, is said to help improve product taste, something industry experts expect will drive increased ingredient diversification in future.

Pea protein is used with soy in products by local brand Next Meats, which has indicated they are exploring other ingredients (such as microalgae). Mung bean protein is starting to appear in commercial scale plant-based meat products, for example, as an ingredient in Beyond Meat's jerky. Faba bean protein is used in Beyond Meat sausages[51] and chicken-style products for its texture, colour and water-holding properties.[52] Japan is among the top three importers of mung bean, while Australia was among the world's top five exporters of mung bean in 2020.[53] Japan is a potential market for Australian faba beans as local demand for it increases.[54]

Investment

Several government initiatives are supporting the development of alternative proteins in Japan. The government's five-year Basic Plan for Food, Agriculture and Rural Areas, launched in March 2020, provides a blueprint for the development of plant-based meats made with soy and other plant protein ingredients with the aim of expanding into new markets.[55]

In April 2020, the Ministry of Agriculture, Forestry and Fisheries (MAFF) set up the Food Tech Study Group, a group of 164 food companies, start-ups, research institutes and other bodies, to diversify sources of protein in the Japanese diet and strengthen the country's food security. Their July 2020 interim report drew special attention to plant-based meat and cultivated meat, labelling them as 'important sectors'.[56] In a white paper in 2021, the Japanese Government proposed that increasing consumption of alternative proteins would help address climate change and make progress towards achieving net zero emissions by 2050.[57]

Japan's cultivated meat sector has attracted new research funding in recent years. IntegriCulture raised USD16.4 million, including USD2.2 million from the Ministry of Economy, Trade and Industry, to build a small-scale facility for the company's CulNet co-culture system. IntegriCulture's most recent round of USD7 million Series B funding in January 2022 will be used towards producing cost-effective growth mediums, as well as making developments open source to accelerate commercialisation efforts. The first product creation, cultivated foie gras,[58] was announced in February 2023.[59] Researchers from separate teams received funding from the Japanese Government's JST-Mirai program to develop small-scale cultivated meat prototypes leveraging bioprinting and stacked hydrogels. A joint research project between the University of Tokyo and Nissin is leading the development of cultivated steak with three-dimensional tissue. Additionally, Osaka University's Matsuzaki Laboratory is using 3D printing technology to create cultivated meat with a complex structure akin to conventional meat, as well as sashimi-like structures.[60]

In the commercial sector, DAIZ, a local plant-based start-up, secured USD6 million Series A funding led by tech venture capital firm Mitsubishi UFJ Capital and Japanese state-backed fund A-Five. The capital raised will be used towards building one of the largest plant-based meat factories in Japan, with an estimated annual capacity of 3,300 tonnes. Its proprietary product 'miracle chip' is made from germinated soybeans, which it claims brings out the flavour and texture of the ingredient to emulate conventional meat without additives.[61]

In 2022, TWO Inc., owner of 2foods plant-based products, announced it successfully raised USD4.4 million in Series A funding from Kagome Corporation, a Japanese leader in processed tomato products.[62] Green Culture is another Japanese company focused on plant-based meats made from soy protein, which received USD2.4 million in Series A funding led by local food snacks manufacturer Kameda Seika, online grocer Oisix and the Universal Materials Incubator.[63]

In the cellular agriculture sector, disclosed investment in companies in Japan has exceeded USD142.6 million.

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Regulatory and trade overview

The regulatory environment for cultivated meat in Japan is developing, with Prime Minister Kishida encouraging in February 2023 plans to start developing Japan's cellular agriculture industry.[64]

Earlier in October 2020, the Food Tech Public and Private Council was formed by the MAFF for the purpose of fostering the new food tech industry. 'Food tech' has not been clearly defined, but alternative proteins, including cultivated meat, have been a focus of the council's discussions. As of June 2022, 420 companies, local authorities, national research institutes, universities and schools are members of this council.

In March 2022, the Food Safety Commission of Japan's research project into the safety assessment methods for alternative proteins was completed, and it is expected for release in 2023. In June 2022, the Ministry of Health, Labour and Welfare (MHLW) formed a team of research experts to discuss new rules regulating cultivated meat. With a new regulatory framework for alternative protein under discussion, major developments in this area are expected.

Also, in June 2022, a group called the Group by Members of Parliament for Promotion of a Sustainable Society by Cellular Agriculture was formed by the current ruling party, the Liberal Democratic Party. The goal of this group is to develop a regulatory system that allows the commercial sale of cultivated meat in Japan. By 2023, the group aims to submit a recommendation or a bill to the government that allows the tasting of prototypes of cultivated meat.

Trade agreements

Australian exporters have tariff-free access to Japan under the Japan-Australia Economic Partnership Agreement (JAEPA)[66], while the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) has either reduced or will eliminate tariffs for both New Zealand and Australian export goods over time.[67]

Australian and New Zealand exporters can also utilise the Regional Comprehensive Economic Partnership (RCEP)[68] free trade agreement, which came into effect in January 2022.

> **We will develop an environment to create a new market, such as efforts to ensure safety and development of labelling rules, and foster a food tech industry originating in Japan. Food tech, including cellular agriculture, is an important technology from the perspective of realising a sustainable food supply. We have to support efforts that contribute to solving the world's food problems.**
>
> **Fumio Kishid**
> Prime Minister of Japan, February 2023[65]

Definitions and classifications

Table 5: Alternative proteins specific definitions

Name	Definitions
代替肉 (substitute meat), or, 植物肉 (plant-based meat)	Meat made from plant ingredients (soy, flour, green peas, broad beans, etc.). The product made from flour is also called gluten meat. This category of meat is further divided into: 1. the products that do not contain animal-origin additives (animal fats, meat extract, etc.) intended for vegans, and 2. the products that contain animal-origin additives.
'培養肉' (cultivated meat)	Meat made by cultivating edible cells and not obtained from animals.

Table 6: Regulatory definitions and classifications

Food Sanitation Act (Act No. 233 of 1947)	
Foods	Defined as providing a nutritional purpose. If a food product is a 'food (ingredient)' and conforms to the requirements set by the Act and its subordinate or relevant regulatory documents, the product can be used with no specific restrictions for use. The exact regulatory requirements can vary depending on the nature and type of the product.
Additives	Defined as typically used to provide a technical effect, i.e., processing aid, etc. Food additives are regulated by a positive list system under which any new additives and/or new intended uses of additives are subject to pre-market approval by the MHLW.

Food Sanitation Act (Act No. 233 of 1947)	
Novel foods	The Act does not stipulate a pre-market approval system for novel foods (or novel food ingredients) under which foods are divided into old or new categories based on their history of consumption. The Act does give the MHLW the authority to ban the use of foods that do not have sufficient history of use and that are negatively associated with health.
Alternative proteins	Classified as a food, and thus subject to the requirements presented on the MHLW website, and some additional requirements if applicable. If an plant-based meat product is compliant with those requirements, its use would be permitted.
Genetically modified (GM) food and ingredients	The use of gene modification (GM) technology in food manufacturing is restricted. Any foods that are composed of GM organisms (crops) and foods (including additives) that are manufactured by using GM microorganisms are subject to pre-market safety evaluation and approval by the MHLW.

Table 7: Permissibility of standard foods and alternative proteins

Permissibility	
Plant-based meat	Permitted on a case-by-case basis.
Cultivated meat	Not permitted for human consumption.
Fermentation-derived meat	Permitted on a case-by-case basis.

Table 8: Labelling, naming and claims regulations

	Relevant legislation
Governing Acts	Food Law - Food Sanitation Act, page 148 of Mintel report, regulated by the responsible agency, as mentioned in In the cultivated meat and proteins from precision and biomass fermentation sector, disclosed investment in companies in Japan has exceeded USD142.6 million Food Labelling Act (Act No.70 of 2013). Food Labelling Standards (Cabinet Ordinance No.10 of 2015).
Misleading displays and labelling	Subject to punishment under the Act against Unjustifiable Premiums and Misleading Representations (Act No. 134 of 1962).
Food labelling system	Available in English from the CAA website.
Alternative protein-specific requirements	If a plant-based meat product is currently permitted for use in Japan, the labelling rules intended for conventional foods would be applied.

Table 9: Naming regulations

	Relevant legislation
Terms including 'Soy meat' and 'not meat'	Not considered as a violation of the Act against Unjustifiable Premiums and Misleading Representations (Act No. 134 of 1962) when such product name is accompanied by other label phrases (such as 'this product uses soy', 'made from soy', and 'meat is not used' in the way that general consumers perceive the product as 'not a real meat'.
Terms including 'burger' and 'sausages'	Permitted if the accompanying label contents clearly explain that the product is not conventional meat. Similarly, 'chickenless meat', 'chicken-free meat', and 'vEEF' would be permitted as they are not considered misleading when seen together with the other label contents.

	Relevant legislation
Vegan and vegetarian foods	New Japanese Agricultural Standards (JAS) for vegetarian and vegan foods are currently under discussion and are expected to be introduced by 2023. Although details of the new JAS are not yet known, the use of 'vEEF' may be permitted only when the product is certified as a JAS product after the new JAS comes into force.
As ingredients	The Food Labelling Standards (Cabinet Ordinance No.10 of 2015) state that the ingredients in the mandatory ingredient listing shall be presented by a generic name. If a plant-based product is made from soy, the name of the main ingredient would be 'soy' or 'processed soy'. In the Q&As related to the labelling of plant-based foods, the CAA states that the terms containing 'meat' and/or 'egg' are not appropriate generic names for ingredient listings.

Table 10: Claims regulations

	Claims
Food labelling and advertisements	Governed by the Food Labelling Act (Act No.70 of 2013), the Food Labelling Standards (Cabinet Ordinance No.10 of 2015) and the Health Promotion Act (Act No.103 of 2002).
Alternative proteins	No regulatory rules for claims specifically applicable to alternative proteins. If a plant-based meat product is currently permitted for use in Japan, the claim rules intended for conventional foods would be applied.
Health claims	Article 9 (10) of the Food Labelling Standards prohibits making health claims on packages of food products. Similarly, Article 65 (1) of the Health Promotion Act prohibits making any misleading health-related representation (including advertisement) related to food products. The exception is the food products that are classified as Food with Health Claims (FHC). According to Article 2 of the Food Labelling Standards, FHC are further divided into three subcategories: • Food with Function Claims ('FFC'), • Food for Specified Health Uses ('FOSHU'), • Food with Nutrient Function Claims ('FNFC'). Their major differences are the scope of active ingredients and the submission requirements. When food business operators wish to make a health claim, they must choose one of the three subcategories of the FHC. In other words, a FFC product cannot bear any FOSHU claims or any FNFC claims, and vice versa. It is permitted to make multiple claims for multiple functional ingredients within the same subcategory. For example, one FNFC product can bear three FNFC claims for Vitamin D, calcium and n-3 fatty acids if the product satisfies the requirements.

Claims

Marketing claims	All text and pictorial information presented on food product packages and advertisements are subject to the Act against Unjustifiable Premiums and Misleading Representations (Act No. 134 of 1962), which prohibits untruthful and misleading displays and labelling of products/services.
No/free claims	No additives/preservatives, free from added/artificial colourings, free from added/artificial flavourings, and free from added/artificial additives. In March 2022, the CAA announced that it would start regulating non-use claims. The guideline for non-use of food additives outlines punishable deviations from the Food Labelling Standards.

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Thailand

Summary

Thailand is the second-largest economy in Southeast Asia and has high levels of economic growth. A business-friendly regulatory environment, interconnected infrastructure, advanced processing capabilities and a strategically advantageous geographic location make Thailand a good market for the co-manufacturing and export of end products.[1] The Government's Future Food Roadmap supports innovation, including alternative proteins and 3D food printing.

Rising disposable incomes are driving increases in the consumption of plant-based meat and the population is decreasing its overall meat consumption. High rates of flexitarian diets in Thailand are driven by historical cultural influences, an appetite for novelty and a willingness to try innovative products.

Australia and Thailand have longstanding and deep trade and business connections, and the bilateral relationship between the two countries was elevated to a Strategic Partnership in 2020. Both nations cooperate in a broad range of mutual interest areas, including trade and investment, agriculture, migration and tourism.[2] New Zealand and Thailand also have long-standing and good relations that encompass bilateral political, security, trade, and economic links, and they work cooperatively on environmental issues and climate change.[3]

Thailand is the fifth most favourable market included in this research for plant-based meat. Its meat substitutes' revenue market is estimated to have a value of USD39.11 million in 2022 and is projected to grow at a compound annual growth rate (CAGR) of 14% between 2022 and 2027. Its volume of meat substitutes reached 4.3 million kg in 2022, an equivalent of 0.1 kg per capita. With a 15% volume CAGR between 2022 and 2027, volumes are projected to reach 8.9 million kg by 2027.[4]

> **Thai consumers still do not know how to integrate plant-based ingredients into their everyday cooking. Brands need to continuously develop products to address Thai consumers' lack of familiarity with the category (such as ready meals).**

Ratchanida Veeratanabutr
Insights Manager Alternative Proteins, Thai Union

Market landscape

Socioeconomic and cultural factors

Thailand has sustained strong economic growth and has significantly reduced poverty, moving from a lower-income to an upper-middle-income country in less than a generation.[5]

In 2022, Thailand's GDP was USD495 billion, with a growth rate of 2.6%.[6] Despite ongoing geopolitical risks due to divergent agendas with trading partners, Thailand's economic recovery from COVID-19 has been bolstered by tourism, private and public investment and domestic demand for consumables.[7] Historically, Thailand has successfully attracted foreign direct investment (FDI), and this has helped to drive economic growth in the last two decades. It is the third major FDI destination in the ASEAN (Association of Southeast Asian Nations) region, and FDI is highly concentrated: Japan, the United States and Singapore are the main investors.[8]

Thailand has relatively strong logistics in place to receive imported goods. The World Bank International Logistics Performance Index ranks Thailand thirty-second globally with a score of 3.41 out of 5, which places the country among the top-performing upper-middle-income economies after China but it is the lowest ranked out of the five markets assessed for this report.[9] This good standing is likely to continue since the Thai government announced in 2022 a USD42.8 million plan to invest in additional land, sea and air transport infrastructure throughout the country.[10]

The growth of Thailand's middle class, accompanied by rising disposable incomes and low unemployment, is driving the consumption of healthier products.[11] Plant-based meat is gaining popularity among Thai consumers because plant-based foods are perceived as healthy.[12] This has occurred amidst the backdrop of a reduction in meat consumption: 44% of Thais claim to have limited their meat intake in 2022, a 10% increase from 2021.[13]

Thai food has its own historical traditions and is influenced by regional neighbours, including China, India and other Southeast Asian countries (such as Myanmar, Vietnam and Malaysia). Meals in Thailand are shared family-style and commonly comprise rice, meat and/or fish, vegetables, noodles or soup. Snacks including chicken satay, raw vegetables with spiced sauces, dips, soups, salads and sweets are common. Thai meals generally include five key attributes: salty, sweet, sour, bitter and spicy.[14]

Plant-based foods have long been associated with Thai culture and the Buddhist religion. However, the form of Buddhism followed in Thailand does not strictly prohibit meat consumption.[15]

Although traditional plant proteins (like tofu) and mock meat are the most commonly available vegetarian protein options in the country, the recent trend of plant-based and flexitarian diets is driving consumer interest in plant-based meat.

The World Bank International Logistics Performance Index ranks Thailand thirty-second globally with a score of 3.41 out of 5, which places the country among the top-performing upper-middle-income economies after China.

Retail and foodservice landscape

Thailand has a developed food industry with established retail and foodservice channels and is one of the largest retail segments in Thailand at USD89.7 billion in 2020.[16]

In 2021, total food and drink sales in foodservice reached USD19.65 billion and have been steadily increasing since 2016.[17] Thailand has a very competitive food service sector but it imports about 30% to 35% of the food sold in foodservice. The small-restaurant segment, comprising local stores and street vendors, accounts for 75% of restaurant market share. Full-service restaurants make up 15% of Thailand's restaurant industry and are mostly focused on Asian cuisine, with shabu and hot pot formats gaining significant interest in the past three years. High-end restaurants have also gained momentum offering one-of-a-kind food and dining experiences. Thailand's quick service restaurant (QSR) segment has a 10% market share of the foodservice sector and is dominated by international franchises (such as KFC, McDonald's, Starbucks, Burger King and Taco Bell), which currently or have previously offered menus that include plant-based meat.[18]

Three main corporations lead the retail market in Thailand: Central Group, TCC Group and CP Group. Central Group owns supermarket chains Central Foodhall and TOPs Market; TCC Group owns Big C hypermarkets; and the CP Group owns convenience store chain 7-Eleven, Lotus and cash-and-carry chain Makro.[19] Thailand's supermarket and hypermarket segments are very competitive, with TOPs Market leading in the number of stores, followed by Big C, Villa Market and Foodland. Stores are generally concentrated around Bangkok and other major provinces, targeting medium to high-income earners with high-quality products and services.

To stand out from the competition in the highly competitive retail market, supermarket chains seek exclusive products from their foreign importers and import agents of unique and hard-to-find products. Most supermarkets have dine-in areas enabling suppliers to offer food items not only on shelves but also on restaurant menus or as takeaway prepared meals.[20] Hypermarkets and 'cash-and-carry' establishments cater to mainstream consumers and are expanding into provinces beyond Bangkok due to high land costs and lack of space for developments in the city. Main hypermarket operators include Tesco Lotus and Big C. Local industry interviews note that while the ratio of imported versus local products tends to be equal in Thailand, at Tesco Lotus and Big C it is more skewed towards local products, with a 70:30 ratio. These hypermarkets are also branching out into smaller-scale store formats (such as express stores and convenience stores).[21]

While there is potential to grow plant-based meat offerings in larger 'cash-and-carry' or hypermarket chains, industry experts suggest that supermarkets are the preferred channel for plant-based meat as they target mid- to upper-income consumers and urban residents, which is aligned with the target market for plant-based meat consumers. Supporting this view, Thai Union (a major seafood company with plant-based products) is said to focus on premium supermarkets, including Foodland, Villa Market and Gourmet Market, after attempts to enter hypermarkets revealed that consumers were not interested in more expensive options of products they were already buying.

Thailand has a very competitive food service sector but it imports about 30% to 35% of the food sold in foodservice. The small-restaurant segment, comprising local stores and street vendors, accounts for 75% of restaurant market share.

Convenience stores have benefitted from steady growth, driven by demand for convenient, low-cost and timesaving foods. It is also a highly competitive segment dominated by 7-Eleven with about 64% market share, followed by Tesco Lotus Express with a 9% share and Family Mart with 6%. 7-Eleven has vending machines selling food, beverages and non-food items in areas not conducive to opening a store.[22]

Online food retail sales in Thailand totalled USD47 billion in 2020, up from USD33 billion in 2017, but this only equates to 10 to 15% of total retail sales revenue.[23] The demand for more convenient and timesaving food, accelerated by COVID-19, prompted grocery retailers to strengthen their online presence. Thai Union is selling its plant-based products via online channels that deliver throughout Thailand and are said to have had a lot of traction with online consumers in Phuket. Plant-based products are also sold via retailers' social media channels, including Facebook, Instagram, Line and major e-commerce platforms (such as Shopee and Lazada).[24]

Due to COVID-19, many foodservice businesses adapted to new models such as the 'ghost kitchen' format, which is gaining popularity by allowing businesses to produce food for delivery in a cost-effective way. GrabKitchen successfully brought together restaurants under the same roof in busy urban areas in Thailand. The 'delco' model—small food outlets focused on takeaway and delivery in high-traffic areas – is also popular in Thailand. Recently this model has been shifting from department stores and community centres to stand-alone outlets in more convenient locations (such as the Bangkok Mass Transit System (BTS Skytrain) stations, petrol stations and office buildings.

Online food retail sales in Thailand totalled USD47 billion in 2020, up from USD33 billion in 2017, but this only equates to 10 to 15% of total retail sales revenue.

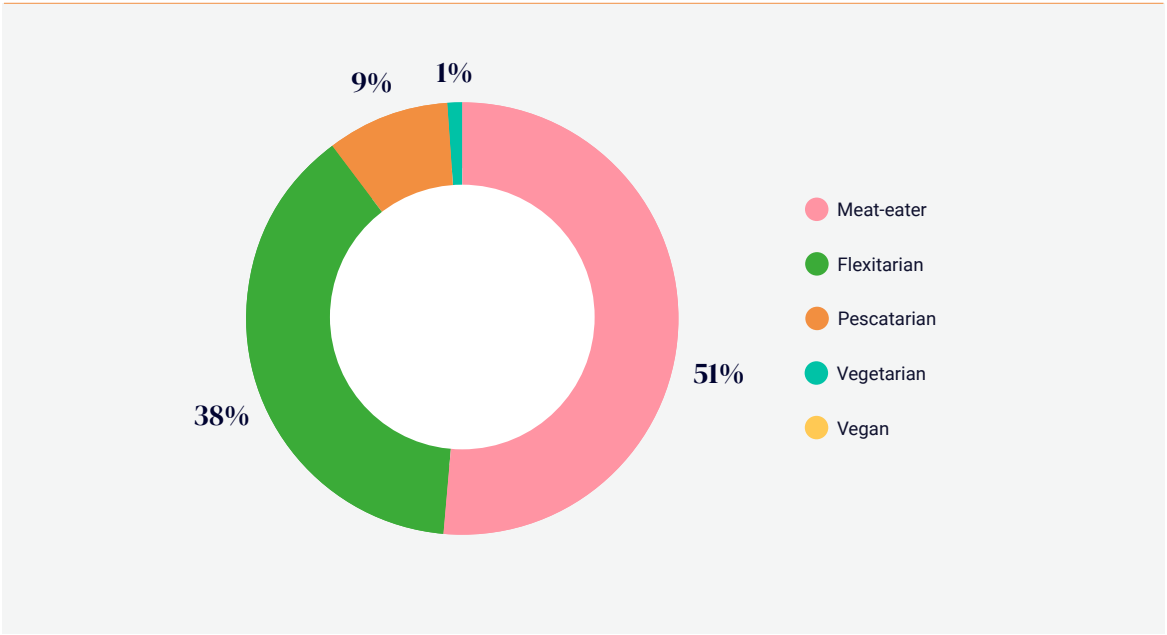
Consumers

Dietary preferences

In Thailand, meat-eater remains the most popular diet preference, representing 51% of consumers, but many Thais are reducing meat consumption and incorporating plant-based foods into their diets.

Compared to the other focus markets, Thailand has the highest percentage of consumers who identify as flexitarian (38%). This trend varies among different demographic groups, with higher numbers of female consumers (44%), consumers aged 35 - 44 (54%) and those with a significantly higher household income of more than TBH 50,000/month (USD1,466) (49%) more likely to be flexitarian.

Figure 1: Dietary preferences



Base: 1,000 internet users aged 18-45+
Source: Rakuten Insight/Mintel.
Meat-eaters eat red meat or poultry.
Flexitarians eat plant-based options at some meals, replacing red meat, poultry, fish/seafood, eggs or dairy.
Pescatarians eat no red meat or poultry but eat fish/seafood, dairy and eggs.
Vegetarians eat no red meat/poultry or fish/seafood but eat dairy and eggs.
Vegans eat no animal products.

Compared to the other focus markets, Thailand has the highest percentage of consumers who identify as flexitarian (38%).

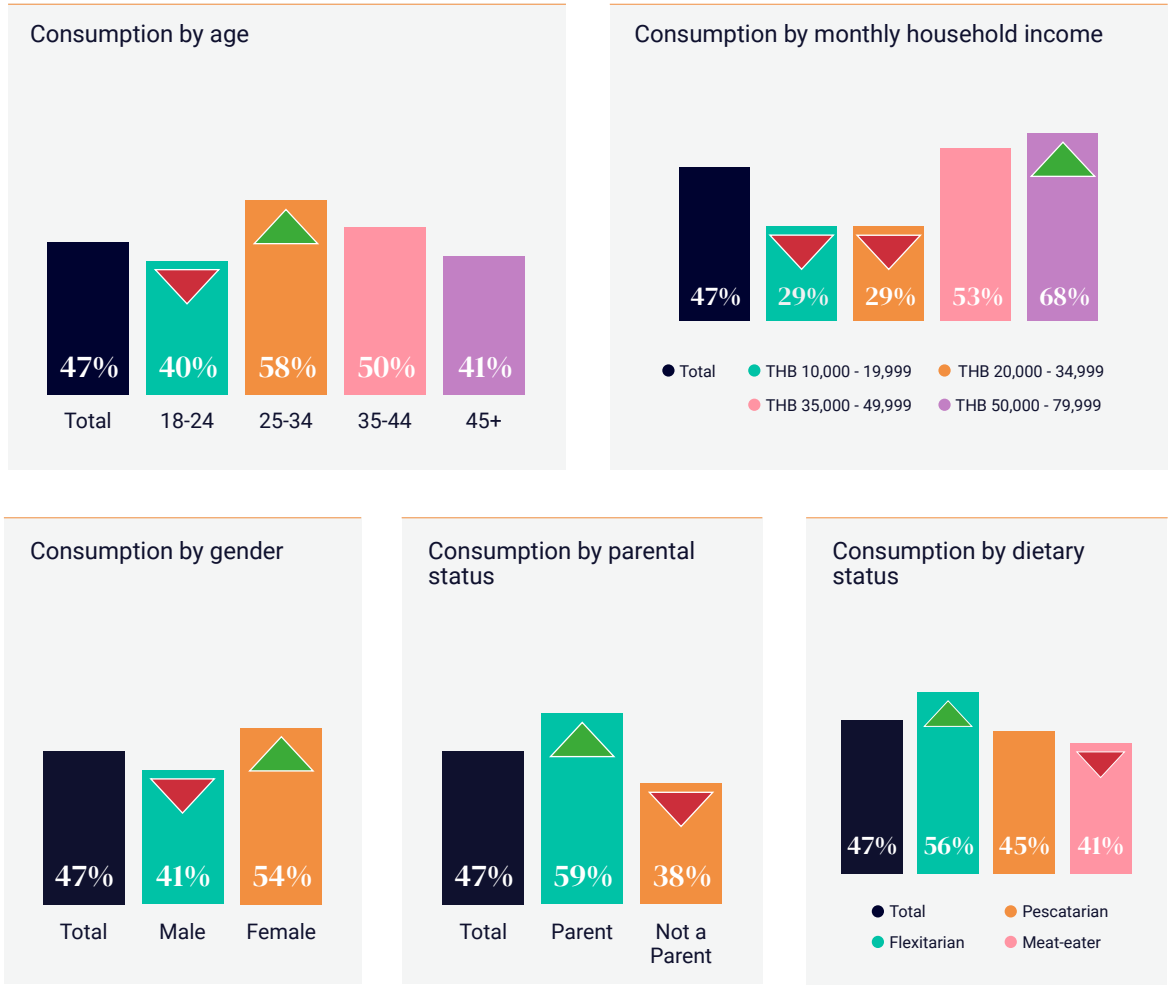
Plant-based meat consumption

Figure 2 shows that with almost half (47%) of the population having consumed plant-based meat overall, plant-based meat consumption is significantly higher among female consumers (54%), consumers aged 25–34 (58%), parents with children in the home (59%) and flexitarians (56%).

The consumption of plant-based meat rises with household income, especially among consumers with monthly household incomes between THB50,000–79,999 (about USD1,467– 2,347), which have the highest consumption rate (68%).

The desire to reduce meat/seafood is also becoming more common among Thais regardless of dietary preference: over one-third of consumers (35%) plan to reduce the intake of at least one type of meat, fish or seafood in the next six months.

Figure 2: Plant-based meat purchase and consumption, by demographic



Base: 1,000 internet users aged 18-45; 950 internet users aged 18-45+ who shop for groceries in the household.
Source: Rakuten Insight/Mintel.

▲ Significantly higher than total at 95% confidence interval. ▼ Significantly lower than total at 95% confidence interval.

Drivers

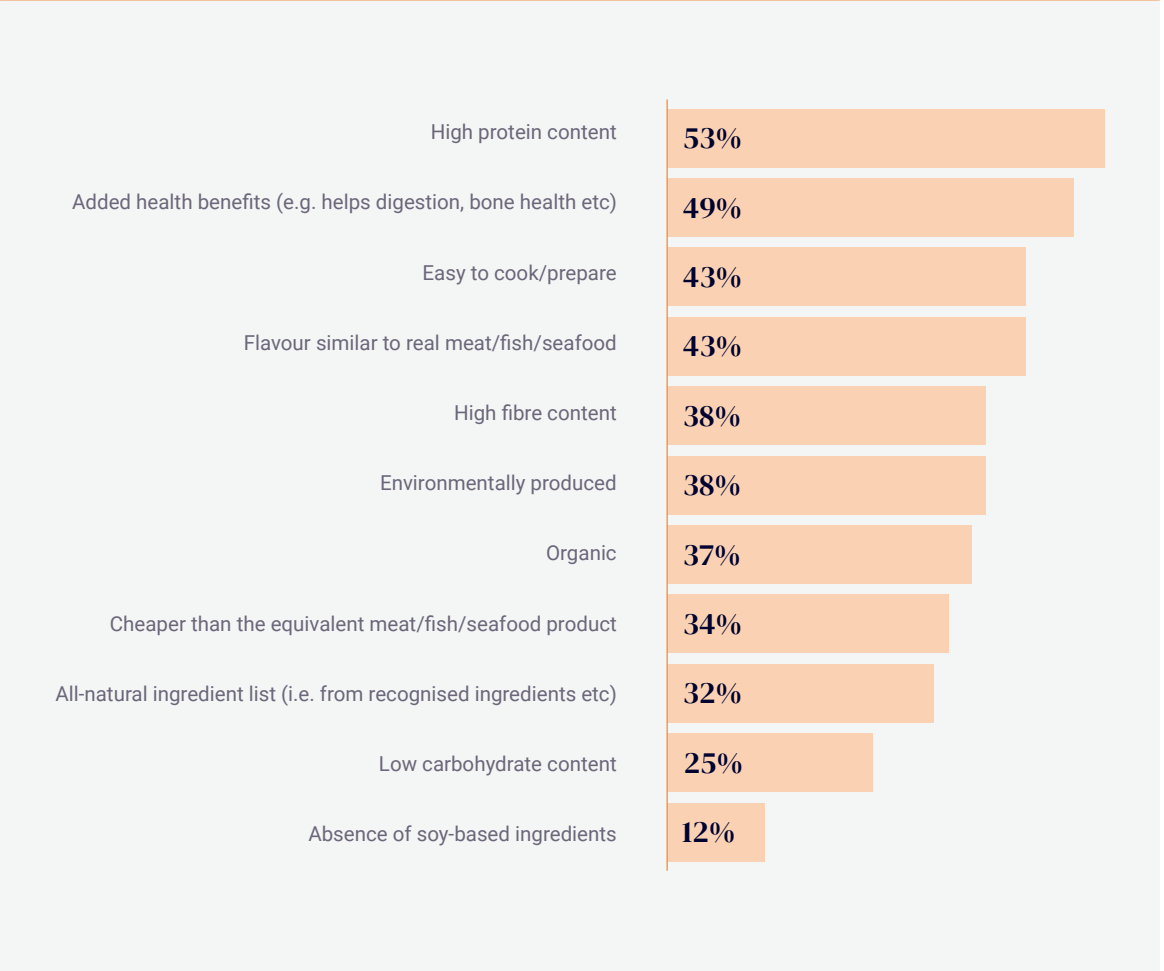
When purchasing plant-based meats, consumers consider high protein content (53%) and added health benefits (49%) as the most important factors, followed by ease of cooking/preparation (43%) and flavour that replicates conventional meat, fish or seafood equivalents (43%), as Figure 3 shows.

To have a wide reach and appeal to more than 80% of consumers, brands should call out high protein, health benefits, ease of cooking and meat-like taste attributes.

The primary drivers for buying plant-based meats for Thais are improving overall health (50%), adding more variety of proteins to diet (43%), environmental concerns (42%), safety concerns including avoiding animal-borne diseases (41%), liking the taste (40%) and animal welfare concerns (38%).

Messaging about health benefits and plant-based meat's role as a versatile protein source are useful to appeal to consumers, as these factors are also cited as key motivations among non-plant-based meat consumers who would consider consuming the product in the future.

Figure 3: Factors when purchasing plant-based meat products



Base: 913 plant-based meat buyers aged 18–45+ who would consider purchasing again or non-plant-based meat buyers who would consider purchasing in the future.
Source: Rakuten Insight/Mintel.

Barriers

Overall, Thai consumers are highly receptive to plant-based meat products, with only a small number (n=75) not considering consuming the products in the future. The two main barriers are high price and product format not suited to meal preferences, followed by a lack of sensorial appeal (such as taste and texture), as Figure 4 shows.

Figure 4: Barriers to consuming plant-based meat

Base: 75 plant-based meat consumers aged 18–45 who would not consider consuming again or non-plant-based meat consumers who would not consider consuming the product in the future (note: given the small base size for this question, the results must be interpreted with caution).
Source: Rakuten Insight/Mintel.

Country of origin preferences

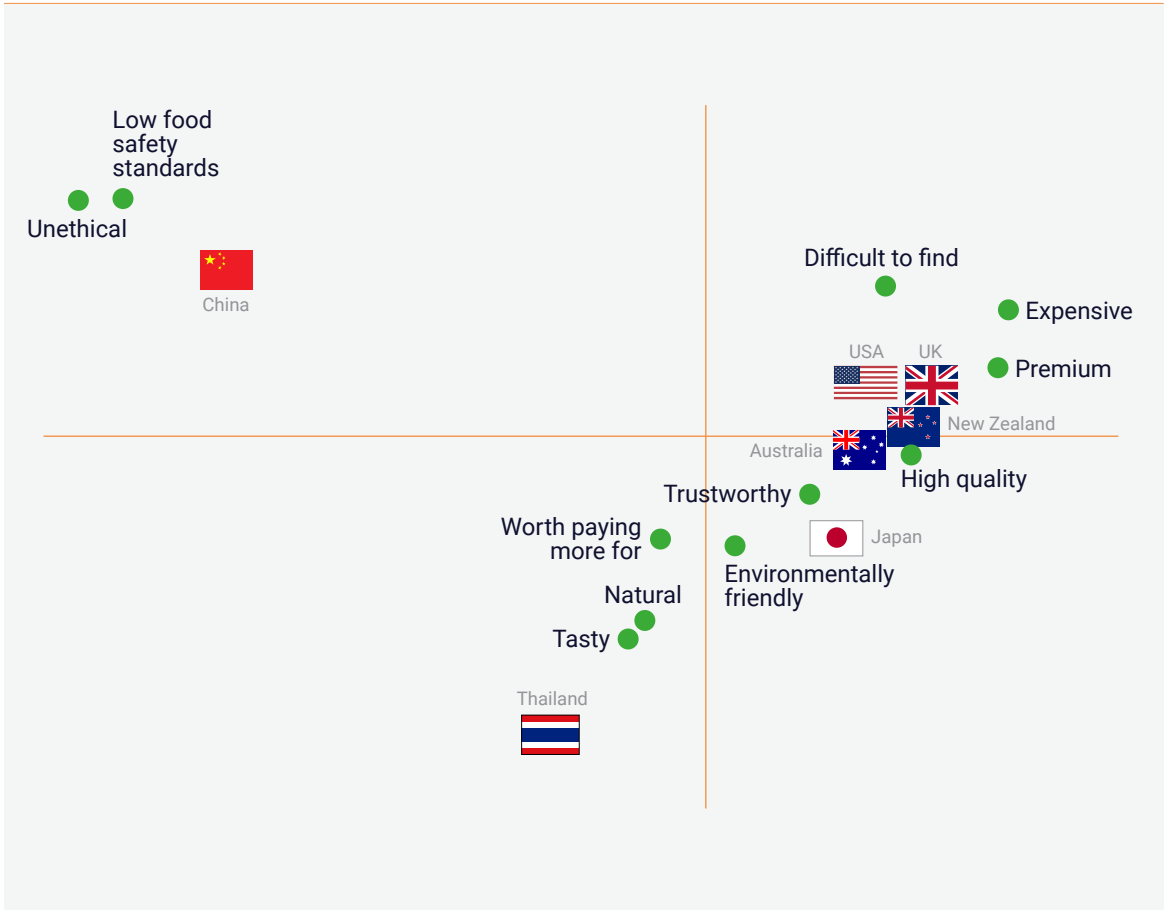
Australian and New Zealand manufacturers can benefit from the natural and eco-friendly perceptions Thais have of products from these countries. Thai consumers tend to have favourable perceptions of food from most countries, except for China. Australia and New Zealand products have relative advantages because they are perceived as being high quality and trustworthy; products from Japan also have similar perceptions.

Although the US and UK are also associated with high-quality and premium attributes, they are perceived as more expensive and difficult to find. Products made in China are perceived to have low safety standards and be unethical.

Local Thai products are perceived as tastier and more natural relative to other markets. Paying attention to local flavours and recipes and highlighting natural and environmental credentials could help Australian and New Zealand plant-based meat businesses to strengthen their country of origin profile even further in Thailand.

Australia and New Zealand products have relative advantages because they are perceived as being high quality and trustworthy; products from Japan also have similar perceptions.

Figure 5: Perceptions of provenance



Correspondence analysis measures the relationship between and within two groups of variables and is used for perception measurement in market research. In this research, country perceptions were measured against the range of attributes represented in Figure 5. It is a statistical visualisation method for picturing the associations between rows (image, attitudes) and columns (brands, products, segments, etc.) of a two-way contingency table.
Base: 1,000 internet users aged 18+.
Source: Rakuten Insight/Mintel.

Place of purchase and frequency

Eighty-one percent of plant-based meat consumers shop for their groceries through both online and instore channels (compared to 72% of general consumers) and are more likely to shop via online retail platforms than general consumers.

In regards to typical grocery shopping venues, most Thais tend to shop at supermarkets and hypermarkets (84% among total consumers and 91% among plant-based meat consumers), which usually have a wide selection of grocery items, including plant-based meat.[25] The next most common shopping venues, with attendance by around two-thirds of both plant-based meat and general consumers, are convenience stores, fresh markets and traditional/wet markets; with drug stores the least popular at only 21% for plant-based meat consumers and 17% for general consumers.

There is high engagement with plant-based meat among Thai consumers. Forty-seven percent of Thais claim to have consumed plant-based meat in the past six months. Over one-third of plant-based meat consumers (36%) say they substitute animal protein with plant-based meat daily, and 41% report consuming plant-based meat two to six times a week in a meal that would otherwise include meat/seafood. This aligns with existing findings from a 2020 global survey examining attitudes to plant-based meat, which found that the majority of Thai respondents (55%) said they want theirs to come from plants - among the highest in the world,[26] and other studies indicating high rates of incorporating plant based foods in their diets.[27]

Thai consumers report eating plant-based meats as part of their lunch, breakfast and dinner. The growing interest of Thai consumers in increasing their protein intake has created an opportunity for plant-based meat products to be incorporated across all main meals, including breakfast. According to the survey, plant-based meat is often consumed as a main dish (64%) and a side dish (63%).

To reach Thai consumers, social media is by far the most effective channel; 70% use social media to learn more about plant-based meat products (73% among plant-based meat consumers). Many Thai consumers also get information from other media outlets (such as TV and radio, 44%); food and beverage retailers (41%); brands (40%); and foodservice (34%).

There is high engagement with plant-based meat among Thai consumers. Forty-seven percent of Thais claim to have consumed plant-based meat in the past six months.

Consumer perceptions of cellular agriculture

Food made using cellular agriculture technology is not regulated for sale in Thailand, and at the time of writing this report, there were no regulatory developments underway in the country for these products. Thai consumers are the second most likely of all five markets surveyed to consume cultivated meat and products of precision and biomass fermentation.

One-third (34%) of Thai consumers have heard of cultivated meat, with 34% saying they would definitely purchase it and 33% indicating they would likely purchase it once it becomes available: the highest consumer acceptance among all five markets surveyed. The top drivers for consumption are the potential health benefits, better for animals, and trying something new. For those unwilling to try cultivated meat, potential barriers were listed as unfamiliarity (47%), likely high price (39%), concerns over health (35%) and concerns over taste (34%).

Consumer awareness of precision and biomass fermentation sits at 36%, with 36% of consumers indicating they would definitely purchase and 37% indicating they are likely to purchase products of precision and biomass fermentation. The top three reasons for being willing to purchase precision fermentation products are potential health benefits, trying something new and the products being better for animals. Unfamiliarity (59%), concerns over taste (39%) and concerns over health (38%) are the top three barriers cited by consumers unwilling to try these products.

Since taste and trust attributions are less associated with cultivated meat and products of precision and biomass fermentation, education about the production methods and the products' taste, texture and health attributes would be required to improve the appeal of these products.

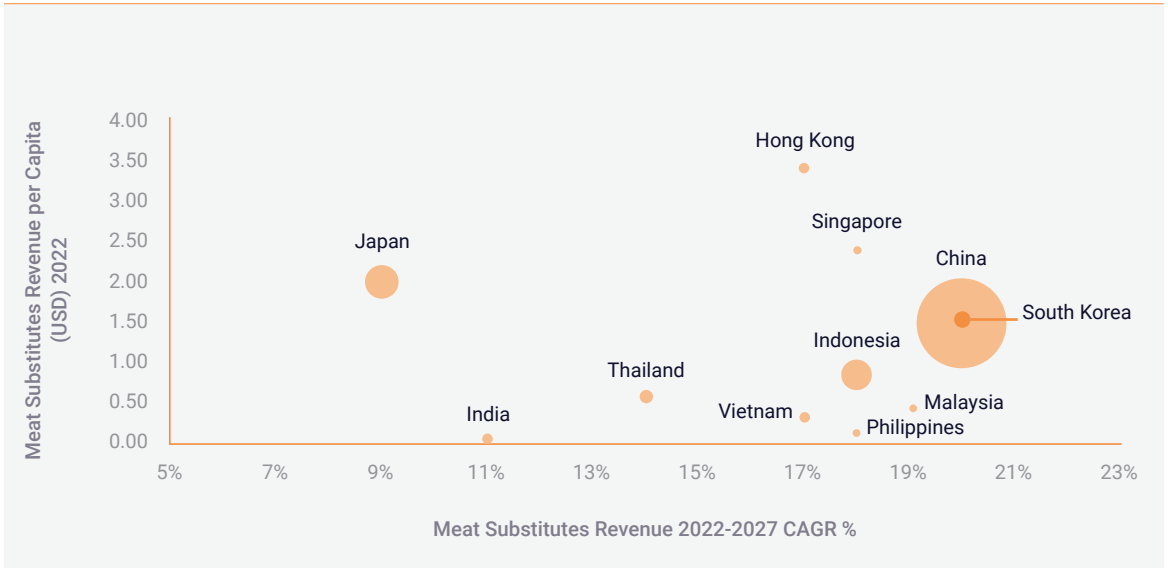
Alternative proteins landscape

Market size

Thailand's meat substitutes market reached USD39.11 million in 2022 and is projected to grow at a CAGR of 14% between 2022 and 2027.

Thailand's volume of meat substitutes sold in retail was expected to reach 4.3 million kg in 2022, with a volume growth of 16.9% in 2024. With about 15% volume CAGR between 2022 and 2027, volumes are projected to reach 8.9 million kg by 2027, as Figure 6 shows.[28]

Figure 6: Meat substitutes market revenue size and growth, by selected Asian markets



Note the size of the bubble represents the total meat substitutes revenue (million USD) in 2022. As defined by Statista, the Meat Substitutes segment covers plant-based meat and mock meat.

Company representation

Table 1, Table 2 and Table 3 show a range of domestic and international alternative protein brands/ companies and businesses supplying plant-based meat or developing cellular agriculture products in Thailand. Innovation in plant-based meat has been growing quickly in Thailand, with new product launches accounting for 12% of all meat substitutes launched in Asia between 2017 and 2022.[29] Local industry stakeholders point out that brands are incorporating Thai flavours to appeal to local tastes.

Although large domestic meat and seafood manufacturers (such as Thai Union Group and Charoen Pokphand Foods PLC (CPF) and local SME brands are prevalent in this market, the presence of international brands has grown in the past two years.[30] In addition to large US brands (such as Beyond Meat and PlantEver), Tyson Foods has recently launched its plant-based brand First Pride at ThaiFex Anuga Asia Food & Drink Trade Fair and invested significantly in local marketing with large billboard advertisements.[31] Experts note that international players have the upper hand with higher levels of investment and a longer timeframe to develop products.

Table 1 and Table 2 indicate prominent domestic and international plant-based meat brands sold in Thailand.

Innovation in plant-based meat has been growing quickly in Thailand, with new product launches accounting for 12% of all meat substitutes launched in Asia between 2017 and 2022.

Table 1: Domestic plant-based meat brands sold in Thailand, at May 2022

Domestic brands		Plant-based meat products (style and/or format)	Distribution channels
KROP	Krop (SeaTech Intertrade)	Dim sums, crispy pork belly	Instore retail Online retail
let's plant meat	Let's Plant Mea (Nithi Foods)	Burger, mince, meatballs, shrimp cutlets, ready meals	Instore retail Online retail
Mantra PLANT-BASED SEAFOOD	Mantra	Ready meals that include seafood alternatives, bacon, ham, shrimp balls, shrimp cake, shrimp mince	Food service Instore retail Online retail
Meat Avatar	Meat Avatar	Crispy pork, mince, dim sums, ready meals	Instore retail Online retail
MEAT ZERO	Meat Zero (CPF)	Ready meals, bologna, chicken patty, chicken nuggets, chicken popcorn, crispy pork, mince	Instore retail Online retail

Domestic brands		Plant-based meat products (style and/or format)	Distribution channels
meatly	Meatly (Betagro)	Katsu, pork	Foodservice Instore retail Online retail
meatoo	Meatoo (FoodDeeHub)	Beef ribs, fish cake, shrimp balls, salted fish, ready meals with mince and chicken	Instore retail Online retail
PLANT BASED	MudJai (Inno4 Co)	Meat skewers, patty	Instore retail
MORE MEAT	More Meat (More Foods Innotech)	Mince, larb meatballs	Instore retail Online retail
OMG Meat	OMG Meat (Thai Union)	Fish nuggets, chicken nuggets, dim sum, crab meat patty	Instore retail Online retail
VEGANREADY	Vegan Ready	Burger, sausage, nuggets, mince	Instore retail
Velicious Food	Velimeat (Velicious Food)	Mince	Online retail
โยตาอาหารเจ	Youta	Chicken, duck, pork, seafood, meatballs, sausage, dim sum	Instore retail Online retail

The above is not a complete list of every available brand.

Table 2: International plant-based meat brands sold in Thailand, at May 2022

International brands		Plant-based meat products (style and/or format)	Brand Origin	Production	Distribution channels
BEYOND MEAT	Beyond Meat	Mince, sausage, burger	United States	Imported	Foodservice Instore retail Online retail
FIRST PRIDE	First Pride (Tyson)	Burger, nuggets, chicken popcorn bites, larb bites	United States	Domestic	Instore retail Online retail
OMNI	Omni (Green Monday)	Mince, luncheon, strips, dim sum/dumplings, seafood	Hong Kong	Domestic	Foodservice Instore retail Online retail
Phuture	Phuture	Burger, mince	Malaysia	Imported	Foodservice Instore retail
PlantEver	PlantEver (Cargill)	Nuggets, meatballs	United States	Domestic	Online retail
v2	v2 (v2food)	Burger	Australia	Imported	Foodservice

The above is not a complete list of every available brand.

Cellular agriculture companies

Food made using cellular agriculture technology is not yet approved for sale in Thailand. Despite this, Thailand's leading local food companies are collaborating with and investing in global leaders in cultivated meat to help accelerate go-to-market strategies for cultivated products in Asia. Thai Union signed memorandums of understanding with US-based cultivated seafood leader BlueNalu in 2021[32] and with Israeli cultivated meat pioneer Aleph Farms in September 2021, in addition to investing with both companies, as mentioned in the partnerships section further below. Major agrifood business Charoen Pokphand Foods signed a partnership with Israeli cultivated meat company Future Meat Technologies in 2022 to develop and distribute cultivated meat products in Asia.[33] Some cultivated meat companies with operations in Thailand are shown in Table 3.

Table 3: Cellular agriculture companies with operations in Thailand, at May 2022

Companies		Location	Area of focus	Approximate disclosed funding (USD)
ALEPH FARMS	Aleph Farms	Israel	Vertically integrated cultivated	*
BlueNalu	BlueNalu	United States	Vertically integrated cultivated	*
FUTURE MEAT	Future Meat	Israel	Vertically integrated cultivated	*

*As Aleph Farms, Blue Nalu and Future Meat are headquartered in Israel and the United States but have agreements or partnerships with Thai companies, their investment figures have not been added to the total investment figure for Thailand.

Product formats

Manufacturers in Thailand and neighbouring countries are focused on developing pork, chicken and seafood alternatives. These are popular types of meat among Thai consumers, and beef is less popular.[34]

Plant-based meat products in Thailand are available in various formats and nuggets, mince and meatballs are by far the most popular.[35] Ready meals and meal kits made with plant-based meats are becoming more available as consumers' interest in health, convenience and plant-based foods continue to grow.[36]

Most manufacturers are making pork and chicken-style plant-based meats, and there are few companies making seafood-style products, making OMG Meat, owned by Thai Union Group, prominent in the market. Industry experts point out that while the fibrous texture of crab and tuna is easier to recreate with soy-based textured vegetable protein (TVP), replicating the springiness of shellfish, texture and flavour is less successful with TVP. Thai Union's innovation centre is reported to have created a method of mixing a gelatinous ingredient with water and coconut oil to mimic the bouncy texture and aroma of shrimp.

Since 2019, manufacturers have increasingly focused on making plant-based meats that suit local tastes and Thai cuisine. Format and flavour innovation are growing in variety and expanding from Western-style products (such as burger patties and sausages), commonly seen when plant-based meat was first introduced to Thailand by international companies.[37]

Most Thai manufacturers cater to local preferences by making products that are compatible with Thai cooking, feature local flavours or align with trending dishes. For example, Meat Avatar, which focuses on Asian-style plant-based meats, launched plant-based crispy pork—a local favourite meat dish—as its first product. Plant-based ready meals of popular local dishes (such as holy basil stir-fry and southern-style plant-based mince in yellow curry paste) are also available.

In 2021, OMG Meat introduced its ready-meal plant-based seafood range, including crab shumai, crab meat, fish nuggets and shrimp dumplings, shown in Figure 7. They also released plant-based BBQ pork buns and chicken nuggets. The products are promoted as being healthy, with high protein content and a taste, texture, and aroma similar to conventional meat/seafood equivalents.

Launched in May 2021, both the OMG Meat Plant-Based Crab Meat patty and the OMG Meat Plant-based Shrimp Dumpling are promoted as high in protein, with no cholesterol, preservatives or antibiotics. Their similar taste and texture to conventional seafood are emphasised and they can be eaten as a main meal or side dish in Thai-style meals.

Figure 7: OMG Meat plant-based seafood range

Source: Mintel Global New Products Database.

> **In order for our plant-based shrimp to have the same springiness as conventional shrimp, our innovation centre has come up with a new method, mixing the gelling agent with water and coconut oil, to mimic the bouncy texture and smell of the shrimp. The main focus of OMG Meat is to provide a consumption experience as close to the type of meat that we are replicating.**
>
> **Ratchanida Veeratanabutr**
> Insights Manager Alternative Proteins, Thai Union

Price

Unlike other Asian markets, where most consumers are willing to pay the same or less for plant-based meats compared to conventional meat equivalents, 42% of Thai consumers who are current buyers or interested in buying in the future are willing to pay more for plant-based meat products. This is especially true for flexitarians and current plant-based meat consumers.

The desire to live a healthier lifestyle, which drives demand for wholesome, nutritious food, has contributed to a growing appreciation of plant-based food among Thai consumers.[38]

Local plant-based meat manufacturers aim to be price competitive with conventional meat equivalents. The average price premium per 100 g of plant-based meat is highest in crumbed chicken-style products, which are priced 54% higher than meat equivalents. The price gaps are lower in mince and ready meal products, with price premiums of 23% and 9% respectively, which Table 4 shows.

Local industry experts point out that key pricing challenges in this market stem from relying on soybean imports combined with current low market volumes of locally grown soy. An increase in consumer demand and volume, coupled with increased competition from other soybean markets, notably China, could reduce prices.

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Table 4: Price comparisons, selected plant-based meat products

Product format	Average price per 100g of locally produced plant-based meat	Average price per 100g of conventional meat	Price premium for plant-based meat in comparison to conventional meat	Total pack size of plant-based meat
Chicken-style, crumbed	USD1.60	USD1.04	**54%**	150-380g
Mince	USD1.35	USD1.10	**23%**	200-1000g
Meatballs	USD1.98	-	**-**	85-240g
Ready meals	USD0.73	USD1.67	**9%**	220-340g

Source: Mintel Global New Products Database.

Partnerships

The majority of local and imported plant-based meat brands launch in Thailand by partnering with large foodservice chains to build brand recognition.

Collaboration between plant-based meat manufacturers and foodservice providers has become an effective way to introduce new menu items and increase adoption among Thai consumers. Many collaborations also demonstrate how the foods can be incorporated into local dishes.

Since 2020, local and international QSRs have introduced menus with plant-based meat, helping to popularise the food among flexitarians and meat eaters. Beyond Meat partnered with QSR chains in Thailand, including Starbucks, McDonald's and Sizzler,[39] while local brand Meat Zero partnered with Subway stores across Thailand to launch a plant-based garlic and herb patty in March 2022.[40] Plant-based meat options have also featured in upmarket restaurants (such as Mei Jiang, which offered a nine-course dinner with Chinese plant-based dishes).[41]

Beyond QSRs many other local foodservice outlets in Thailand also incorporate plant-based meat in Thai cuisine dishes. Khiang, a street-food restaurant chain under Zen Group, launched Meatless Pad Kaprao across all of its branches nationwide, see Figure 8. The plant-based pork used in Khiang's menu is supplied by Let's Plant Meat, a local plant-based meat start-up. The menu highlights the appealing taste similar to conventional pork while calling out the healthiness of plant-based meat.

While partnerships are driving the introduction of new products into the Thai market, partnerships are also driving research and development and capital investment to develop plant-based meat and cultivated meat industries.

Figure 8: Meatless pad kaprao (stir-fry plant-based meat with holy basil)

Source: Khiang. The product was launched by street-food restaurant chain Khaing featuring Let's Plant Meat.

Meat manufacturer teams up with foodservice

Betagro, a major meat manufacturer in Thailand, introduced plant-based pork products under the brand 'Meatly!' and is actively promoting it by partnering with top-tier restaurants in Bangkok, including Bangkok Trading Post. The restaurant has introduced new items (such as Spicy Meatly! Meatball Casserole and Meatly! Surf & Stuffed Umami Soba to its menu: both dishes are made with Meatly! plant-based pork).

Manufacturing and sourcing

The food and beverage manufacturing industry is the country's third largest industry contributing 21% to the country's GDP[42] at around USD70 billion in 2023.[43] Thailand 4.0 is the Thai government's 20-year economic development plan from 2017 to 2026. It focuses on reforming and advancing the country's economy,[44] and it includes positioning Thailand's food industry as a leading manufacturing hub and exporter.[45] The plan focuses on four key areas: fostering entrepreneurship, scaling innovations, leveraging online marketing platforms and improving food standards. Included in the plan is 'Future Food', a program that aims to become a key economic initiative to support innovations, including plant-based foods.

Thailand's food processing sector has developed rapidly and is one of the leaders in Southeast Asia. Thailand saw a 64% increase in plant-based meat exports in 2021, positioning it as the world's twenty-fifth largest exporter of plant-based meats.[46] There are many medium and large food processors that manufacture value-added products dependent on significant amounts of imported ingredients not grown locally.[47] Thai Union and NF Instant provide co-manufacturing or private label services for other major international plant-based meat businesses, with more companies in Thailand expected to offer services such as these in coming years.[48]

Ingredients

Soy has been the most popular plant protein source for plant-based food and beverage innovations in Thailand during the past three years.[49] Compared to other plant-based proteins, soy protein has wider availability, lower costs and broader applications.[50]

Local production of soybeans is minimal, and imports are needed to meet domestic demand. Soybean imports are expected to increase by 5% to 4.5 million metric tonnes between 2021 and 2023.[51]

Other sources of plant protein ingredients in Thailand include peas, wheat, mushrooms, seeds and rice.[52] Jackfruit is a popular ingredient for mimicking the texture of conventional meat–Thailand is one the top three producers of jackfruit in the world,[53] so there may be opportunities for plant-based meat start-ups to utilise it as an ingredient. Konjac, a tuber, is also used to mimic the texture of conventional meat, and its production could be increased since it can be intercropped with rubber, a dominant crop in this market.[54] Konjac and jackfruit can help to replicate conventional meat texture in plant-based meat products, but plant protein is often added to improve protein content.

Given the growing demand for plant-based protein products and Thai consumer's interest in novelty food, there are opportunities to explore less common plant-derived ingredients (such as pea, mung bean, jackfruit, chickpea and algae) and to innovate across the value chain, including sourcing, product formulation and processing.

Investment

To build a strong start-up ecosystem, the Thai government is fostering the development of R&D centres that connect public sector research facilities with universities and private labs (such as SPACE-F, Thailand's first food tech start-up incubator and accelerator, established in 2019).

Led by the National Innovation Agency of Thailand, Mahidol University and Thai Union, it aims to help entrepreneurs commercialise their products by connecting them to potential investors.[55] SPACE-F has helped bring to market brands (such as Let's Plant Meat and More Meat).

Thailand's plant-based meat market has attracted significant interest and investment from the private sector. NR Instant was the first plant-based food company to be listed on the Stock Exchange of Thailand in October 2020, raising about USD51.4 million in its initial stock offer. The company focuses on plant-based Thai foods (such as plant-based meat made from jackfruit).[56] State-owned energy company PTT Pcl, Thailand's largest company in market value, is also entering the plant-based protein market through a joint venture with NR Instant worth USD12.71 million, which will be operating commercially by mid-2023.[57]

The growing demand for plant-based foods in domestic and international markets has also prompted Thai Union Group, one of the largest manufacturers of tuna in the world, to set up a Global Innovation Centre in Thailand to create an alternative protein future which also considers novel food technologies for the multinational company. The company partnered with several start-ups through a venture fund aimed at the production of cultivated seafood. This included a USD30 million venture fund with US-cultivated seafood leader BlueNalu in 2019,[58] as well as investment towards Israeli cultivated meat pioneer Aleph Farms Series B USD105 million fundraising round in 2021 along with other industry-leading investors.[59] In 2022, Thai Union also invested USD10 million in Mara Renewables Corporation, a leading Canadian manufacturer of sustainably grown algae ingredients that can be used to nutritionally fortify plant-based foods.[60]

Regulatory and trade overview

Thailand is considered a gateway country to Southeast Asia due to its favourable regulatory environment. Currently, there are no regulatory developments underway in Thailand for cultivated meat and products of precision and biomass fermentation.

Exporters should be aware that Thailand scored 35 out of 100 on the 2021 Corruption Perception Index, which measures companies' perceptions of corruption in the government. This is the lowest rating of all markets surveyed in this report.

Trade agreements

The Thailand-Australia Free Trade Agreement (TAFTA) is one of two FTAs that Australian businesses can leverage to trade with Thailand under preferential rates. As a member of ASEAN, Thailand is also part of the ASEAN-Australia-New Zealand Free Trade Agreement (AANZFTA). Exporters should keep in mind that tariffs and duty rates are frequently updated and can change without notice.[61] Country of origin declaration is mandatory for imported foodstuffs, but there are no detailed rules laid down on the manner of declarations for origin.

Definitions and classifications

Table 5: Regulatory definitions and classifications

	Definition
Plant-based meat	No legal definition for plant-based meat or similar terms for alternative proteins. Based on the definition of novel foods, whereby foods being available for consumption for less than 15 years or using new production processes, mycoprotein products, plant-based meat and cultivated meat created through cell cultivation technology are considered novel foods in Thailand.
Novel foods	Notification of the Ministry of Public Health No.376 B.E 2559 (2016) Re: Novel Food 1. Any substance used as food or a food ingredient that has been significantly used for human consumption less than 15 years, based on scientific or reliable evidence or; 2. Any substance used as food or food ingredients to which has been applied a production process not currently used, where that process gives rise to significant changes in the composition or structure of such food which affect their nutritional value, metabolism or level of undesirable substances or; 3. Any food product contains either (1) or (2) as an ingredient.
Mycoprotein products and cultivated meat created through cell cultivation technology	Classified as novel foods. Subject to pre-market approval on a case-by-case basis. More detail available through the guidelines (Thai).
Final product containing alternative protein	For composite processed products containing meat substitutes/analogues as ingredients, there are no specific provisions established for the finished products due to the use of meat substitutes/analogues as ingredients; such finished products fall under the scope of relevant conventional food regulations if such regulations exist depending on the factors (such as predominant ingredients, state and physical forms of the products and the manner of consumption). For example, if the final products containing meat substitutes/analogues as ingredients are canned products, there is a Ministry of Public Health Notification No 355 B.E. 2556 (2013) Food in a Hermetically Sealed Container. This notification lays down general requirements for canned food and other food commodities in the scope but no particular details about plant-based meat alternatives/analogues as ingredients.

	Definition
Genetically modified (GM)	The notification of the Ministry of Public Health No. 431 B.E. 2565 (2022) (Thai) regarding foods derived from GM organisms is recently updated legislation. Notification 431 lays down a positive list of GMOs authorised to be produced, imported and sold. This includes plants, animals and microorganisms. GMOs not included in the positive list require pre-market approval from the Thai Food and Drug Administration (FDA). The notification also prescribes certain general requirements for GMOs as well as methods of analysis. Various GMO corn and soybean products that were previously allowed by Notification 251 will continue to be allowed for a further five years if they are included in the revised list.

Table 6: Labelling regulations

	Relevant legislation/requirements
Plant-based meat	Plant-based meat is considered a novel food in Thailand. Clause 6 of Notification No. 376 for novel food outlines additional labelling requirements for novel foods in general, in addition to the horizontal labelling requirements for foodstuffs. Clause 6 contains labelling rules for date marking as well as requirements for declaring the name of the active ingredients (if any) and instructions/ conditions of use.
Horizontal	Ministry of Public Health of Thailand Notification No. 367 B.E. 2557 (2014) Re: Labelling of Pre-packaged Foods, as amended by Notification No. 383 B.E. 2560 (2017). The labelling of finished products is subject to this horizontal labelling legislation.

Table 7: Naming regulations

	Relevant legislation/requirements
Conventional meat and other product names for the meat equivalents (e.g. meatball and hamburger)	Without any particular restrictions or prohibitions, these names may be used in product names for alternative products, providing the words are accompanied by appropriate descriptive words or expressions indicating plant-based or alternative meat.
As ingredients	Clause 6 in Notification No. 376 for novel food contains requirements for declaring the name of the active ingredients (if any). No further details are available to define 'active ingredients' and manner of declarations. The labelling of ingredients in the finished products is subject to this horizontal labelling legislation, e.g. Notification No. 367 as amended. Without any particular restrictions or prohibitions, the words for conventional meat and other product names for the meat equivalents may be used as ingredient designation for alternative products in the ingredient listing, providing the words are accompanied by appropriate descriptive words or expressions indicating plant-based or alternative meat.

Table 8: Claims regulations

	Relevant legislation/requirements
Alternative protein claims	There are no specific provisions for the use of claims based on alternative protein products in Thailand. The use of claims will be subject to horizontal legislation on claims for foodstuffs and ingredients in general.
Nutrition claims	Notification No. 182 of the Ministry of Public Health B.E. 2541(1998) Re: Nutrition labelling, as amended (English/ Thai) There are two amendments issued to this notification: • Notification of the Ministry of Public Health No. 219 B.E. 2544 (2001) Re: Nutrition Labelling (No. 2) • Notification of Ministry of Public Health No. 392 B.E.2561 (2018) Re: Nutrition Labelling (No. 3). Appendix No. 4 and Tables under the Appendix in Notification No. 182 provide conditions of use for nutrition claims. For nutrients, only those nutrition claims listed in the notification are permitted for use. Since there is no permission for the use of nutrition claims for trans fat, the claims 'low/no/reduced trans fat' are not permitted. It is not recommended to use the generic term 'vitamin/mineral fortified' but rather to indicate the specific vitamins or minerals involved.

	Relevant legislation/requirements
Health claims	Nutrient function claims fall under the broad category of health claims, which may be used without a pre-market authorisation. The FDA Re: Displaying a statement claiming the function of a nutrient lays down the conditions of use for nutrient function claims and a list of permitted nutrient function claims. Only listed nutrient function claims are permitted for use without pre-market approval providing the conditions of use prescribed are met. There are certain claims based on the nutrients specifically listed. The use of nutrient function claims should comply with the general principles laid down in Section 1.3 under Appendix No. 4 in Notification No. 182. For other health claims not listed, they require pre-market approval.
Other health claims	Other types of health claims are divided into the following categories: • other function claims which are in relation to specific beneficial effects of consuming the food or part of the food for the body to function properly (e.g. 'Nutrient X has an effect on ….', 'Product A contains 5 g of nutrient X') • reduction of disease risk claims (e.g. 'food that contains a low level of X may reduce the risk of disease C'. 'Product A has a low content of X'). Regarding other types of health claims, they are subject to pre-market authorisation requirements, e.g. health claims other than approved nutrient function claims need to be authorised for use by the Thai FDA before they can be included in labelling. The Manual for Requesting Health Claim Assessment contains details regarding criteria, conditions and procedures for submitting an application to the Thai FDA for health claims. The manual is intended to assist applicants in preparing applications for the authorisation of health claims. In addition, there is the guidance for health claim authorisation. Health claims of interest that are not authorised nutrient function claims listed require pre-market approval on a case-by-case basis.
Marketing claims	Other claims which are not nutrition or health claims would be classified as marketing claims. There are no specific provisions on marketing claims other than such claims needing to be truthful and not misleading or deceptive or likely to create an erroneous impression regarding its value, merit or safety. Clauses 9, 10 and 11 in the horizontal labelling legislation Notification No. 367 B.E. 2557 (2014) Re: Labelling of Pre-packaged Foods, as amended, give general non-misleading principle.

	Relevant legislation/requirements
No/free claims	Absence claims (such as 'free or no' and 'no added' claims for additives or other constituents (other than sugars), the following applies: Articles 10 and 11 in Notification No. 367 contain generic principles for the use of marketing claims. In addition, labelling guidelines state that it is prohibited to make absence claims (no or free etc.) if – • the use of the additive categories in the food is not allowed by the additive legislation • the presence of the substances is not allowed by the applicable legislation, e.g. harmful substances • the substances concerned should not or typically do not exist in the food. To the best of available research, there are no specific provisions or guidelines to address the use of non-addition claims for additive categories and other food constituents. The general truthful, non-misleading and other principles given under Articles 10 and 11 in Notification No. 367 will apply. There are no specific provisions for the use of claims based on alternative protein products in Thailand. The use of claims will be subject to horizontal legislation on claims for foodstuffs and ingredients in general.
Vegetarian/vegan claims	No provisions or guidelines are laid down for the use of vegetarian/vegan claims or similar terms. Mycoprotein can be considered as a vegetarian ingredient. Conversely, cultivated meat, since it is genuine meat, is considered an animal product; it is not vegetarian.
Allergen claims	For absence claims for allergens (e.g. no nuts), they would be regarded as an absolute claim, which may be interpreted by consumers to mean a complete absence; the constitutes claimed should not be present in the food. For allergens, the claims 'low' or 'reduced' would not be acceptable. Requirements for the use of the claim 'gluten-free' are laid down in Notification No. 384 Re: Gluten-free food labelling.

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Glossary

Umbrella terms

Alternative proteins: Encompassing plant-based meat, cultivated meat and products of precision and biomass fermentation.

Meat substitutes: Encompassing both plant-based meat and mock meat. Market size and growth data from Statista used throughout this report applies to meat substitutes.

Cellular agriculture: A term that covers two novel food production technologies—cell cultivation and precision fermentation.

Products

Blended meat: Products that combine a minority percentage of conventional animal meat with a larger proportion of plant-based ingredients–including a plant-based protein. These products typically offer improved nutrition and environmental credentials compared to equivalent conventional meat products. Blended products may offer manufacturers options to improve sustainability, lower costs and improve taste.

Conventional meats/seafood: Animal flesh from a whole mammal, bird or fish, including shellfish or other sea animals. Also referred to as conventional animal meat.

Finished products/goods: Food in its finished form that will not undergo further processing and are ready for sale to the final customer, either an individual consumer, foodservice business, or retail outlet.

Hybrid products: Alternative protein products that contain a mixture of alternative protein types, such as plant-based ingredients combined with cultivated meat or fat produced via precision fermentation.

Mock meats: Long-standing products intended to mimic the look and taste like conventional animal meats, which originated in Asia and have been historically consumed by vegetarian and Buddhist populations. Mock meat is typically made of seitan (wheat gluten) or textured soy, with various flavourings added.

Plant-based meats: Newer products made to taste, look and cook like conventional meat. Early products began appearing in Western markets in the 1970s and 1980s, with a new generation of plant-based meats emerging around 2015 marketed to flexitarians and meat reducers who are seeking familiarity in taste and format to conventional animal meat. Generally, these products contain plant proteins (most often in the form of protein isolates and concentrates) as a base ingredient to achieve a more meat-like appearance and texture.

Traditional plant proteins: Long-standing products such as tofu, tempeh, falafel, and traditional lentil patties, which have existed for centuries and do not closely replicate meat.

Ingredients

Extrusion: A mechanical process that is commonly used in manufacturing food products such as pasta, breakfast cereal, and puffed snacks. In plant-based meat production, extrusion is used to combine and texturise plant protein ingredients into realistic fibrous plant-based meats. It involves pushing the ingredients through a barrel with a screw mechanism and out through a small opening. There are two main types of extrusion:

- **Low moisture extrusion** (LME): Has been traditionally used to produce and texturise plant-based meats. LME typically produces products that are dehydrated or contain low moisture content and therefore have a longer shelf life and is a less expensive process.

- **High moisture extrusion** (HME): Is a newer production process in plant-based meat production that uses a higher water content, with the ingredients undergoing thermal and mechanical stresses from heating of the barrel and shearing of the screws. HME can help achieve a more realistic meat-like texture. Products tend to have a shorter shelf-life due to their higher water content and are therefore sold chilled or frozen. HME is typically a more expensive process than LME.

Fractionation: Refers to the process of isolating the protein component of a raw ingredient, such as peas or faba beans, from the other components including fats and carbohydrates. Various fractionation processes are used depending on the raw material, base ingredient used, or the desired outcome sought by the processor.

Plant protein ingredients: Protein isolates, concentrates or flours derived from legumes, pulses, wheat and other crops via fractionation or other extraction processes. These ingredients typically make up a primary portion of plant-based meat products and are also used in other foods such as baked goods and sports nutrition, or sold directly to consumers.

Protein concentrate: A powder or solution that contains between 40% and 79% protein content. This can be animal or plant protein.

Protein isolate: A powder or solution that contains a minimum 80% protein content. This can be animal or plant protein.

Textured vegetable protein (TVP): also known as textured soy protein (TSP) or textured plant protein (TPP) is small chunks of a high protein flour, typically a by-product of extracting soybean oil. It can be used as an alternative to meat on its own, incorporated into plant-based meat products, or even animal-based products. TVP is generally sold in dehydrated format and rehydrated prior to consumption. TVP is typically produced using soy but may also be produced from any protein-rich meal left over from extracting oil from seeds like lentils, peas, and faba beans.

Cellular agriculture

Biomass fermentation: Utilises microbes such as bacteria or fungi to reproduce and quickly make large amounts of a protein-rich ingredient. In this method the microorganisms that reproduce through this process are the food that is consumed; for example, Quorn grows a filamentous fungi via biomass fermentation that is used as the base ingredient in their products.

Cell culture medium: A nutrient rich solution used to support the growth of cells, usually containing carbohydrates, proteins, fats and vitamins.

Cell scaffold: A physical structure on which cultivated meat cells attach and grow on to form complex 3D structures, which helps to impart the texture and shape of the finished product.

Cultivated meat/seafood: Animal cells created through the process of cell cultivation. A small sample of stem cells from an animal are collected and then grown in tanks called bioreactors or cultivators, which provide a controlled environment. The cells are fed a cell culture medium that contains amino acids, carbohydrates, and vitamins, allowing them to replicate and multiply, mimicking the biological process of growth that would occur within an animal. The cells are typically grown on a cell scaffold, and are harvested, prepared and packaged into final products after about 2-8 weeks.

Precision fermentation: A category of cellular agriculture that uses microorganisms (such as yeast or bacteria) that are programmed to efficiently produce a specific compound (such as a protein or fat). These proteins and fats can be harvested and used to create foods like egg white and dairy products.

Vertically integrated: A term used in this report to describe a cultivated meat company working on end-to-end production of cultivated meat, rather than one constituent component of the production process, or an input for cultivated meat, such as scaffolds, cell lines, or cell culture media.

Consumers

Flexitarian: Someone who consumes plant-based options at some or most meals in place of red meat, poultry, fish/seafood, eggs or dairy, but who still consumes animal products in their diet.

Meat eater: Someone who has no restriction on the amount of animal foods consumed.

Non-consumer of plant-based meats: For the in-market consumer surveys, a non-consumer of plant-based meats was defined as someone who had not consumed plant-based meat in the past six months.

Pescatarian: Someone who does not consume meat from land animals, but does consume seafood products, dairy products and eggs.

Vegan: Someone who does not consume any animal products, including meat, dairy, eggs.

Vegetarian: Someone who does not consume animal meat or seafood products, but does consume animal products such as dairy products or eggs.

Wet market: A marketplace selling fresh foods such as meat, fish, produce, perishable goods and (sometimes) live animals, in a non-supermarket setting. It is distinguished from a “dry market” that sells durable goods such as fabrics, kitchenwares, and electronics.

Research methodology

Correspondence analysis: Measures the relationship between and within two groups of variables and is used for perception measurement in market research. In this research, country perceptions were measured against a range of attributes.

Industry experts: As part of the research for this report, Mintel engaged and interviewed 21 locally based experts working in the alternative proteins field across the five markets. These insights were either given anonymously or are quoted throughout this report.

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