



MEAT THE ALTERNATIVE

2019
State of the
Industry



EXECUTIVE SUMMARY

The future of protein has arrived. Advances in food science, ingredient characterisation, processing and production have resulted in a wave of plant-based meat products designed to replicate the sensory experience of the conventional meat that people know and love. The popularity of plant-based meat is booming as increasing numbers of consumers seek protein alternatives that are tasty, nutritious, familiar and have a lighter environmental impact.

Investment has flooded the global alternative protein sector. This has been driven by increasing market demand, and encouraged by international developments including plant-based meat company Beyond Meat's multi-billion dollar stock market IPO in May 2019.

A growing body of research predicts global expenditure on plant-based meats to reach up to US\$140 billion by 2029 or 10 percent of the \$1.4 trillion global meat market, from less than 1 percent currently,¹ and even up to US\$450 billion by 2040,² although most estimates have predicated less than US\$50 billion by the mid-2020s. The range in estimates reflects the emerging nature of the sector, and highlights the massive opportunity for Australia to become an industry leader during this critical growth phase.

It's clear Australian consumers are hungry for plant-based meats: in new consumer research for Food Frontier by leading market research agency Colmar Brunton (to be released in detail in late 2019), one in three Australians have now tried the new generation of plant-based meat products.³ Australia is consequently witnessing an explosion in the availability and variety of plant-based meat options in foodservice and retail outlets, driven by increasing consumer consciousness about the impacts of their food choices on their health and the planet.

Food Frontier's inaugural paper *Meat Re-Imagined* set the scene for alternative proteins in Australia, translating global advances into the Australian context. Building upon *Meat Re-Imagined*, Food Frontier engaged economic consultancy Deloitte Access Economics to undertake the world's first analysis and quantification of the current and potential size of a plant-based meat sector and its impact on a national economy - Australia's. The results outlined in this report revolutionise our understanding of the sector's potential, and make significant and compelling calls to action for both business and government.

Deloitte Access Economics has quantified the current size of Australia's plant-based meat sector and modelled its growth to 2030. This first-of-its-kind research details the potential economic and employment contribution to both national and state economies that will enable business and policymakers to undertake informed, proactive decision-making.

Modelling growth over three scenarios – conservative, moderate growth and accelerated growth – reveals an industry on the cusp of massive expansion.

Plant-based meat is currently an emerging sector in Australia, generating approximately \$150 million* in Australian retail sales, almost \$30 million in manufacturing and supporting 265 jobs in 2018-2019. By 2030, however, modelling suggests that if the current moderate growth trajectory continues, the sector will generate almost \$3 billion in retail sales, over \$1 billion in manufacturing and employ over 6,000 Australians.

Capitalising on the myriad opportunities presented by this projected growth requires the ambition and engagement of the full range of stakeholders, from growers to government and investors to manufacturers. The results are in: Australia's plant-based meat sector offers significant opportunities across the entire value-chain. Achieving this potential will require action from all parties.

By 2030, based on the moderate growth scenario, Australia's plant-based meat sector is estimated to contribute:



ALMOST
\$3B
IN DOMESTIC SALES



OVER
6,000
FULL-TIME EQUIVALENT JOBS

*Figures in this report are in Australian dollars, unless otherwise specified.

ABOUT FOOD FRONTIER

Food Frontier is Australia and New Zealand's think tank and industry accelerator for plant-based and cell-based meat alternatives. Funded by philanthropy, Food Frontier is proudly independent.

Food Frontier believes that food innovation is critical to feeding the growing global population in the coming decades. By driving science-based solutions to the need and demand for alternative proteins that are sustainable and nutritious, we are working to create a more diversified, efficient and future-proof food supply that is good for people, great for business and better for the planet.

Through research, advocacy, consulting and events, Food Frontier advises and connects stakeholders across the supply chain, from agriculture and science to government and business. We support existing and emerging leaders to capitalise on the opportunities to create and supply plant-based and cell-based meat in the world's most populous region, where diversification is urgently needed.

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	2018-19		2030	
	Current Market	Scenario 1 (Conservative)	Scenario 2 (Moderate)	Scenario 3 (Accelerated)
Direct Value-add (\$)	\$5.0M	\$184M	\$528M	\$1.3B
Indirect Value-add (\$)	\$24.9M	\$214M	\$614M	\$1.6B
Total Value-add (\$)	\$29.9M	\$398M	\$1.1B	\$2.9B
Direct Employment (FTE)	104	698	2,004	5,105
Indirect Employment (FTE)	161	1,402	4,023	10,251
Total Employment (FTE)	265	2,100	6,026	15,356
Australian Consumer Expenditure (\$)	\$150M	\$1.4B	\$2.9B	\$4.6B
Value of Australian Exports (\$)	n/a	\$47M	\$338M	\$1.37B

Figure 1. Key Findings: Economic Modelling of Australia's Plant-Based Meat Sector

CONTENTS

01

EXECUTIVE
SUMMARY

17

AUSTRALIAN
LANDSCAPE 2030

05

GLOBAL
OVERVIEW

25

THE PATH
FORWARD

13

AUSTRALIAN
LANDSCAPE 2019

29

CONCLUSION





GLOBAL OVERVIEW

We're making meat for uncompromising meat lovers, but with a fraction of the environmental impact.

— DR PATRICK O. BROWN, IMPOSSIBLE FOODS CEO

NOURISHING A CHANGING WORLD

From farm to fork, producers of plant-based meat aim to offer consumers familiar meals with a lighter impact on the planet¹⁷ and human health.¹⁸

Raising livestock for food requires about 80 percent of the world's agricultural land,¹⁹ yet it produces less than 18 percent of the world's calories.²⁰ Animal agriculture is a leading cause of deforestation, land degradation, biodiversity loss and habitat clearing worldwide,²¹ and it accounts for more than 14 percent of all human-induced greenhouse gas emissions.²²

While meat is a source of nutrients such as protein, iron and zinc, consuming high levels of conventional meat has also been linked to cardiovascular disease, type 2 diabetes, and colorectal cancer,^{23,24,25} diseases that are among the leading causes of death in Australia.²⁶ In particular, consumption of processed meat (e.g. sausages, bacon, deli slices, etc) has been associated with increased rates of disease and mortality in various meta analyses and large cohort studies.^{27,28,29} With Australians eating more than four times the global per capita average of beef and veal,³⁰ and chicken consumption per capita growing tenfold in the past five decades,³¹ shifting consumption towards plant-based proteins may help to reduce rates of preventable disease and premature death.³²

With the global population increasing rapidly, a major shift in food production and consumption, particularly for protein-based foods, is becoming urgent. The United Nations' Intergovernmental Panel on Climate Change recently found that plant-based diets can help fight climate change,³³ with their major report on land-use and climate change stating that the West's high consumption of meat and dairy products is fuelling global warming.³⁴ In Australia, a recent spatial analysis of state government data found that the beef industry is closely linked to over 93 percent of deforestation in the Great Barrier Reef catchment areas during recent years.³⁵

While incremental improvements in traditional agricultural systems are important, alone, these interventions will fail to meet the enormous challenges facing our food systems.

Chefs, scientists and entrepreneurs around the world are rising to the challenge of pioneering more sustainable protein alternatives, driven by growing consumer demand and propelled by research dollars from governments and some of the world's largest meat conglomerates – from Tyson Foods to Cargill – that are repositioning themselves as 'protein' providers.^{36,37}

With potential for greater production efficiencies, reduced input and processing costs^{38,39} and decreased contribution to diet-related diseases,⁴⁰ plant-based meat is attracting significant industry, investor and government attention. In developed nations, rising environmental, health and food security pressures borne from conventional systems of protein production are precipitating a shift in public sentiment towards plant-based foods.⁴¹

Obviating the need for animal rearing, processing and possible subsequent exposure to faecal contamination,^{42,43} antibiotics⁴⁴ and growth hormones⁴⁵ often present in conventional meat production systems, plant proteins also have fewer food safety risks.

The race to replace animals in industrial-scale protein production systems has begun, with companies setting out to reposition meat as a product defined by its sensory experience rather than its origin. In the words of Impossible Foods CEO, Dr Patrick O. Brown; "We are dead serious about our mission of providing vastly more sustainable options than livestock in the food chain⁴⁶ ... we're making meat for uncompromising meat lovers, but with a fraction of the environmental impact."⁴⁷

THE HISTORY OF MEAT ALTERNATIVES



Early 20th Century

In the early twentieth century, nut and cereal-based products emerged, such as Nuttose and Protose created by pioneers like John Harvey Kellogg, with the intention of promoting good health.⁴ These centre of plate meat substitutes were not necessarily designed to replicate the taste and texture of conventional meat. The rise of these products was driven, in part, by sanitary concerns over the early meat processing sector, with Kellogg also raising questions over the efficiency of animal agriculture in the context of a growing population⁵ – concerns still present today. In Australia, products like Sanitarium's Nutmeat were released as early as 1912⁶ and recorded on the menu of a Sydney cafe in 1933.⁷



Early 21st Century

Meat alternatives entered the mainstream when Burger King became the first American fast food chain to offer a traditional plant-based burger on their menu in 2002.⁸ In the new millennium, awareness about the health and sustainability implications of consumers' diets^{10,11} continued to increase alongside growing demand for alternatives to conventional meat.



Ancient times

Alternatives to meat as a protein source have existed for millenia, with traditional products such as tofu and tempeh (made from soybeans) and seitan (made from wheat protein) used as affordable, functional and nutritious protein sources as early as 965CE¹ and originating in China.^{2,3}



Mid to late 20th Century

Significant advances in production and packaging technology following the Second World War contributed to the development of products based on plant protein concentrates, isolates and textured proteins. This supported the development of soy-based meat alternatives, during a time of increased meat consumption in many developed nations enabled by agricultural advancements and intensified animal farming. Targeted at a niche vegetarian demographic, products such as Tofurky emerged in the U.S. in 1980.⁹



The last decade

Products such as the Impossible Burger¹² and Beyond Burger¹³ herald a new generation of alternatives dubbed 'plant-based meat'. Enabled by modern advances in food science and manufacturing, plant-based meat aims to mimic the taste, texture, look, functionality and even 'sizzle' of conventional sausages, burgers and fillets.

This new generation of meat alternatives, made from blends of plant proteins, fats, gums, spices and seasonings and often processed using extruders or unique processing technologies, has seen strong consumer response internationally, with demand for some plant-based meat products now outpacing supply.^{14,15,16}

BRAND & PRODUCT EXAMPLES



The United States and Europe have led the growth of plant-based meat, driven by the combination of consumer demand, access to investment capital, and depth of domestic intellectual capital.

To date, the plant-based meat industry has primarily focused on developing alternatives to processed red meat products such as burger patties, mince and sausages. Compared to the muscle structure of primary meat cuts such as steak, these formats pose less technical complexities due to their unstructured composition.

While the development of plant-based poultry and fish alternatives has been more limited, some companies such as Rebellyous are leveraging similar techniques to produce plant-based chicken products like nuggets.⁴⁸ Other companies including Good Catch and New Wave Foods have developed plant-based seafood products such as tuna and prawn alternatives.^{49,50}

Key:

-  Long-standing brands (pre-2010)
-  New emergents (post-2010)
-  Major product launches



McDonald's began selling its own version of a plant-based meat burger in Germany in April 2019, supplied by Nestlé.^{59,60}



Omnipork, owned by Hong Kong company Right Treat, launched in April 2018 to cater to an Asian palate familiar with pork-based dishes. The product boasts a higher nutritional value than its conventional counterpart, with 71 percent less saturated fat, 62 percent fewer calories, 233 percent more calcium, and is 53 percent higher in iron.⁶³



In June 2018, Funky Fields 'Minced' became the first plant-based meat product to be stocked in the meat case of any major retailer in Australia.^{55,56} The product sold out in hundreds of Woolworths stores nationwide within the first week.⁵⁷



In early 2019, Australian quick-service restaurant Grill'd, along with boutique chain Ribs & Burgers, launched the Beyond Burger on their menus, followed by Huxtaburger's inclusion of The Alternative Meat Co. burger in May.



Sunfed Meats launched its plant-based chicken alternative in Progressive Enterprises and Foodstuffs Markets in New Zealand in 2017, selling out within days of its debut.⁵⁸

CONSUMER MARKETING

The new generation of plant-based meat products are now available in many major grocery stores across Western countries, in some instances in the meat case. These products are no longer aimed predominantly at vegetarian and vegan consumers, but rather at the growing cohort of omnivorous millennials and ‘flexitarians’, who are conscious of the impacts of conventional meat on both the environment and their health. Flexitarians and meat-reducers now constitute up to one in three consumers in countries such as the U.S.⁶⁴ and Australia.⁶⁵

Product advertising has focused on taste and sensory comparability to conventional meat, while highlighting superior nutritional and environmental benefits. Beyond Meat exemplifies this with a comparison of the environmental impact between its burger and a conventional U.S. beef burger, based on a peer-reviewed Life Cycle Analysis by The University of Michigan (Figure 2).^{66, 67}

Some plant-based meat producers emphasise the health and nutritional benefits of their products,⁶⁸ with health constituting a major factor driving consumers to reduce their consumption of conventional meat.^{69, 70} Marketing of some plant-based meat includes statements about offering greater protein, no trans fat and no cholesterol compared with their conventional counterparts, plus the added benefit of dietary fibre.⁷¹ Plant-based meat can also contain less sodium than comparative pre-seasoned conventional meat.⁷²

To appeal to a broader consumer base beyond vegetarians and vegans, companies are balancing messaging and imagery to highlight taste, experience, health and sustainability. The new generation of plant-based meats are marketed to emphasise the products’ innovative nature to overcome previous associations with dietary restriction and flavour or textural deficiencies.

Companies have engaged celebrities like high-performance athletes and elite chefs to promote products, including Beyond Meat’s use of professional athletes⁷³ from the NBA, WNBA, MLB and World Surf League to act as spokespeople. The Beyond Burger also featured in a Carl’s Jr. advertisement during the 2019 Super Bowl, framing the product as an option that even the most conservative consumer should embrace (Figure 3).

Impossible Foods has partnered with top chefs as ambassadors to appeal to dedicated meat eaters: Momofuku’s David Chang, offal enthusiast Chris Cosentino and self-described “meat-centric” Iron Chef star Michael Symon.⁷⁴

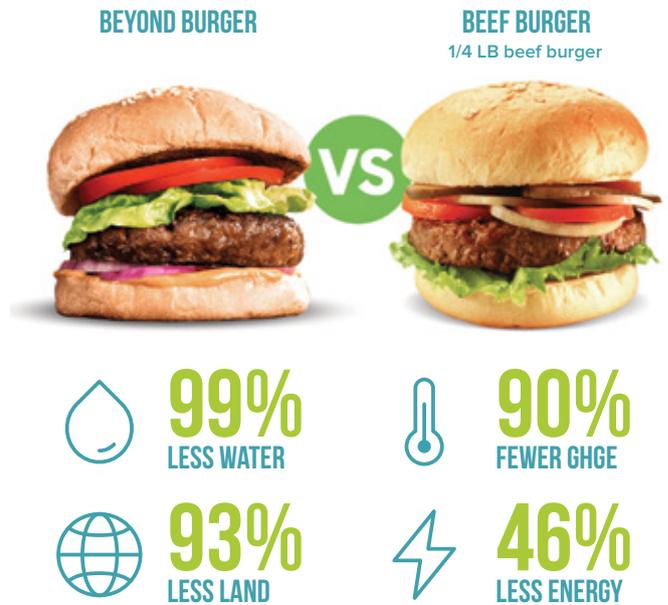


Figure 2. Life cycle assessment comparing Beyond Burger and U.S. beef burger, The University of Michigan, 2018



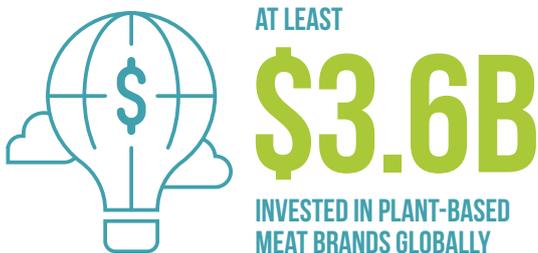
Figure 3. Carl’s Jr. Beyond Meat Super Bowl Ad, February 2019

INVESTMENT

From high-profile investors like Bill Gates, Richard Branson and Hong Kong business magnate Li Ka-Shing, to meat giants Tyson Foods, Cargill and PHW Group, and Singapore government-owned investment company Temasek, powerful stakeholders are capitalising on more resource efficient methods of meeting the more than 50 percent increase in food demand expected by 2050.⁷⁵

Investment in plant-based food brands has exceeded US\$17 billion since 2009 with the majority occurring since 2017. Investments included 233 U.S. deals between investors and plant-based food companies with 43 percent of capital coming from venture capitalists, the most active of which were Blue Horizon, New Crop Capital and Stray Dog Capital undertaking 12 investments each, including follow-on investments for brands in which they already have a stake.⁷⁶ At least US\$3.6 billion has been invested exclusively in plant-based meat brands since the late 1990s.⁷⁷

In May 2019, Beyond Meat's IPO on the NASDAQ resulted in a first day stock closing price 163% above its IPO, making it the best performing first-day IPO of a major U.S. company in nearly two decades.⁷⁸ The US\$240 million IPO proceeds will be used to expand current manufacturing facilities and open new ones, finance research and development as well as boost sales and marketing.⁷⁹



Major Acquisitions

Several large FMCG (Fast-Moving Consumer Goods) and meat companies worldwide have acquired plant-based meat brands, including:



All figures are USD

Government Policy & Investments

Some governments have identified the economic and public health opportunities of plant proteins and subsequently provided a range of support. Examples include:

-  The Dutch Minister for Agriculture launched the \$2 million 'New Food Challenge' in 2017 to support companies to increase the number of new, healthy, plant-based food products. In partnership with business group the Green Protein Alliance, the Dutch government aims to reduce animal-based proteins in the Dutch diet from 63 percent in 2015 to 50 percent in 2025.⁸⁰
-  The Canadian government invested US\$153 million in the Protein Industries Supercluster to develop plant-based alternatives to meet the growing demand for non-animal protein. The funding is estimated to create over 4,500 new jobs and more than an additional US\$4.5 billion in GDP over the next 10 years.⁸¹
-  Germany invested US\$780,000 over three years in 2018 for research at the Technical University of Berlin and Karlsruhe Institute of Technology to improve the texture of plant-based meat alternatives,⁸² which followed a ban in 2017 on the inclusion of conventional meat and fish on menus at official government functions.⁸³
-  In Singapore, state-owned investment company Temasek Holdings, has made multiple investments in Impossible Foods, including leading their US\$300 million Series E funding round in 2019.⁸⁴
-  A 2018 Californian law required plant-based options to be available at hospitals, health facilities and state prisons.⁸⁵



From 7th March 2019, Adrift by David Myers, Bread Street Kitchen by Gordon Ramsay and CUT by Wolfgang Puck (pictured) became the first among eight other restaurants in Singapore to serve dishes incorporating Impossible Foods' plant-based beef, marking a new chapter in Marina Bay Sands' sustainability journey.

GLOBAL CHALLENGES LOCAL SOLUTIONS

Many consumers seeking to reduce their meat consumption still wish to enjoy the familiarity of meat, with its taste, nutrition, functionality and cultural associations. These consumers state health, environment and animal welfare as the driving factors behind this shift to plant-based meat products which cater to these motivations.⁸⁶

Convergence of changing consumer interests, sustainability challenges and compelling commercial opportunities has driven significant investment into plant-based meat from major conventional meat and FMCG companies to high-profile venture capitalists and forward-thinking governments.

The global plant-based meat landscape is now witnessing increasingly frequent product launches, representing a growing body of research and development (R&D) that continues to spur the creation of more sophisticated products. Taste, texture and mouthfeel of products will only continue to improve with further ingredient and processing advancements.

Despite its rapid and growing success, the sector is still in its infancy globally, and must overcome various challenges as it scales up. Examples include establishing reliable ingredient supplies and maintaining a regulatory framework that allows for the use of common terms such as 'burger', 'mince' and 'sausage', currently used by many plant-based meat producers to describe the format and intended use of their products.

Australia faces an inflection point wherein it may cede the opportunity to become a first mover in the Asia Pacific to increasingly competitive and globally-focused plant-based meat industries in the U.S. and Europe. However, by leveraging its geographic, intellectual and infrastructural assets, Australia has the chance to stake its claim.

The new research presented in *Australian Landscape 2019* and *Australian Landscape 2030* in this paper quantifies Australia's 'size of the prize'. A range of interventions and opportunities for business and government are explored in more detail in *The Path Forward*.



Impossible Bao from Little Bao Restaurant in Hong Kong

AUSTRALIAN LANDSCAPE 2019

COMMERCIAL MARKET

Food Frontier's research with Deloitte Access Economics has, for the first time ever, mapped and quantified the potential size of Australia's plant-based meat sector – explored in this chapter – establishing the 2018-2019 financial year as a benchmark.*

In 2018-2019, Australian consumers spent an estimated \$150 million on plant-based meat products, across retail (\$115 million) and foodservice (\$35 million) channels.

In 2018-2019, the manufacturing of plant-based meat products contributed an estimated \$29.9 million of value-add to the Australian economy. This comprised \$5 million in direct contribution and \$24.9 million in indirect contribution to other sectors of the economy, including: food processing; professional, scientific, technical and other services; utilities; transport, and; agriculture.

Plant-based meat supported employment of 265 full-time equivalent (FTEs) jobs in 2018-2019. Approximately 104 FTEs are directly employed in the sector at present, while a further 161 are employed in associated upstream sectors. There are currently no known exports of Australian plant-based meat, and with approximately half of all products sold at retail imported, there is an opportunity for Australian-produced products to capture a larger share of the domestic market.

Australia's plant-based meat sector is in an emerging state, with economies of scale yet to be achieved. As a result, production is resource-intensive and costs are high, relative to revenue. Hence, the share of direct economic contribution (i.e. value-add within the sector itself) generated by the plant-based meat sector is relatively subdued compared to more mature sectors. This phenomenon is typical of a new and rapidly growing industry as efficiencies in the production process are still emerging. As the sector matures, costs are expected to fall relative to rapidly growing sales, with the share of direct economic contribution continuing to rise.

Retail Sales

The retail sales figure of \$115 million represents the retail sales value of plant-based meat products purchased at major supermarkets and other retail outlets in Australia. The vast majority of these products are sold for preparation and consumption at home. The most common plant-based meat products available and sold in Australian supermarkets are in the form of burger patties, sausages and mince. These products are sold in the freezer, chiller case and more recently in the meat case of some supermarkets, with all major supermarket chains now stocking a selection of plant-based meat products, catering to different consumer preferences – from traditional offerings to 'new generation' products.

In some instances, plant-based meat products are achieving price parity with premium conventional meat, though many are yet to achieve competitiveness in terms of scale and cost. Most plant-based meat products attract a price premium relative to their conventional meat counterparts – between 25 percent to 50 percent more on a dollar per kilo basis. Australian brands Unreal Co. and Vegie Delights, as well as Fry's (South Africa), Funky Fields (Denmark) and Tofurky (U.S.) have products in the lower price range of \$15-20 per kg.

In the case of burger patties, locally manufactured options such as The Alternative Meat Co. and Veef burgers average \$34 per kg. Imported plant-based burger patties comprise two distinct categories, a lower, more accessible price point, such as Linda McCartney at \$22 per kg, and a higher premium price such as the Beyond Burger at \$53 per kg. Plant-based burger patties, whether locally produced or imported, currently command a price premium compared to conventional beef patties (see Figure 4). This highlights an opportunity for greater price competitiveness by local manufacturers to increase their products' accessibility to a broader price-conscious consumer base.¹

*For definitions and complete methodological details, please refer to the glossary and appendices of the full Deloitte Access Economics report.

In 2018-2019, Australia's plant-based meat sector contributed:

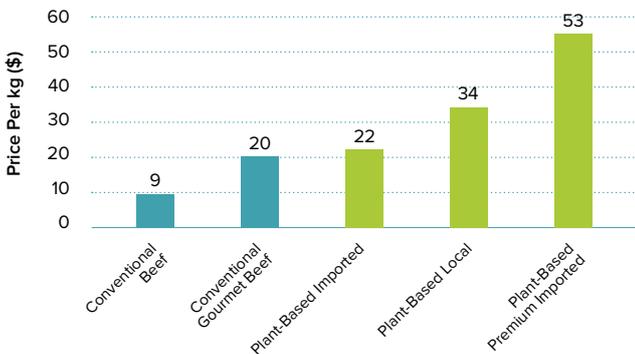


Figure 4. Price comparison between conventional beef patties and plant-based burger patties in Australian supermarkets

Food Service

The majority of Australian foodservice plant-based meat sales occur within Quick Service Restaurants (QSRs) such as Grill'd, Lord of the Fries and Huxtaburger, with the majority of these sales comprising imported products. This is partly due to insufficient local supply of quality, new generation products that taste and perform like conventional meat. Plant-based meat products continue to generate growing interest from foodservice chains, with many more, including Hungry Jacks, expected to stock plant-based meat options in the near future.

As the availability, quality and range of products continues to grow to meet rising demand, foodservice is expected to contribute an increasing share of overall sales. Currently, the price premium attached to plant-based meat products in foodservice is between \$3 to \$4 per burger, or around 30 percent compared to a conventional burger.

In May 2019, Competitive Foods Australia, the parent company of Burger King's Australian franchise Hungry Jacks, announced plans to enter a partnership with Australia's federal science agency, CSIRO, to establish plant-based meat start-up v2food. v2food's first product, a plant-based meat burger, is expected to launch through Hungry Jacks nationwide in late 2019.



CONSUMER TRENDS

Publicly available research into Australian consumer dietary trends, including propensity to consume plant-based meats, has been largely absent from the current discourse surrounding food system reform. We know that the percentage of vegetarians in Australia is on the rise, increasing from 9.7 percent in 2012 to 11.2 percent in 2016,² but detailed statistics have been unavailable until now.

In 2019, Food Frontier commissioned leading market research agency Colmar Brunton to undertake a detailed analysis of consumer dietary trends through representative national samples of almost 2,500 Australians and New Zealanders. These results will be released in a separate paper in late 2019 to fill the gap in publicly available research, with some initial insights presented here.

Colmar Brunton's research shows that 32 percent of Australians are either 'flexitarians' or meat-reducers.³ Respondents to Colmar Brunton's survey identified health, environmental sustainability and animal welfare as the three main considerations for foregoing or reducing conventional meat consumption, a combination of motivations that suggests a long-term trend.

Two in three participants in the study indicated that they had not yet tried the new generation of plant-based meat products. Of those who have tried meat alternatives of any kind (tofu, traditional or new generation products), 43 percent said they were either 'satisfied' or 'mostly satisfied' with the taste,⁴ highlighting an opportunity for manufacturers to improve their products to better meet consumers' sensory expectations.



32%

OF AUSTRALIANS HAVE CONSCIOUSLY LIMITED THEIR MEAT CONSUMPTION

2 IN 3

AUSTRALIANS HAVE NOT YET TRIED THE NEW GENERATION PLANT-BASED MEAT PRODUCTS



BRANDS & PRODUCTS

In a recent analysis, Food Frontier identified over 100 plant-based meat products – both traditional style and new generation – produced by 21 brands, on the shelves of Woolworths, Coles and IGA supermarkets.

These products cover a broad range of food categories including burgers, sausages, mince, nuggets, schnitzels and seafood. A number of additional brands and products are available in specialty stores, restaurants and foodservice outlets.

It is worth noting that across these brands, product taste and comparability with conventional meat varies greatly due to the choice of ingredients and manufacturing techniques. Traditional processing methods and ingredients, such as soy and wheat, are often used by legacy brands like Vegie Delights, while ‘new generation’ plant-based meat products like the Beyond Burger

and The Alternative Meat Co. sausages often employ more novel processes and ingredients to achieve a sensory experience comparable to conventional meat. Nine of these brands are manufactured within Australia, and five brands are from the U.S., with two each from New Zealand and the UK, and one from each of Canada, Denmark, South Africa, Taiwan and Thailand.

The Australian plant-based meat sector is in an early and rapid stage of development, and witnessing the emergence of a number of new domestically produced products and brands. Several new Australian start-ups and plant-based meat manufacturers, including long-standing butchers, food manufacturers, and award winning chefs, predominantly from Victoria and New South Wales, are aiming to launch products in major retailers and foodservice in late 2019. These products will help address retailers’ desire to stock quality, locally produced, new generation plant-based meats to satisfy growing consumer demand.

Brand	Plant-based meat products stocked in major Australian retailers*	Retailers	Manufacturing Origin
The Alternative Meat Co. 	2-5	coles 	 Australia
Bean Supreme 	6-10	coles  	 New Zealand
Beyond Meat 	1	coles 	 USA
Coco & Lucas 	2-5		 Australia
Eaty 	2-5	coles 	 Australia
Field Roast 	2-5		 USA
Fry's Family Foods 	>10	coles  	 South Africa
Funky Fields 	1		 Denmark
Gardein 	6-10	coles  	 Canada
Linda McCartney 	6-10		 United Kingdom
Loma Linda 	6-10	coles	 Thailand
Nature's Kitchen 	2-5	coles	 Australia
Next-Gen 	1		 Australia
Quorn 	>10	coles  	 United Kingdom
Sophie's Kitchen 	5-10	coles  	 Taiwan
Sunfed 	1	coles	 New Zealand
Tofurky 	2-5	 	 USA
Unreal Co. 	2-5		 Australia
Veef 	1		 Australia
The Vegan Factor 	2-5		 Australia
Vegie Delights 	>20	coles  	 Australia

Figure 5. Brands sold at major Australian retailers

*Number of products available at selected major Australian supermarkets (Woolworths, Coles and IGA) as of August 2019.⁵ Number of product offerings varies per store.

AUSTRALIAN LANDSCAPE 2030

To date, there has been no known publicly available study of the economic impact of a plant-based meat sector on a national economy. In addition to quantifying the size and economic contribution of Australia's plant-based meat sector in 2018-2019, Food Frontier, through Deloitte Access Economics, has modelled the potential growth of the sector to 2030. Rigorous economic input-output modelling was bolstered by financial data from Australian manufacturers, international market data and a broad range of stakeholder consultations, from manufacturers and investors to QSRs and major retailers.*

Deloitte Access Economics' research demonstrates overwhelmingly strong growth prospects for Australia's plant-based meat sector over the next decade. By 2030 the Australian plant-based meat sector is projected to grow from \$150 million in consumer expenditure in 2018-2019 to between \$1.4 billion and \$4.6 billion, a range reflecting potential growth trajectories.

Plant-based meats' future contribution to the Australian economy can be framed through a suite of broader economic measures. These include employment and value-added products, as well as exports, with Australia's positive food reputation¹ and increasing demand for plant-based products in key export markets² indicating significant export potential. As the plant-based meat sector in Australia grows, so too will the economic contributions across these measures.

This chapter explores the potential economic contribution of the plant-based meat sector to Australia's economy by 2030 over three scenarios, modelling possible growth in consumption, investment and trade from a range of variable inputs, based on the best information currently available. Further modelling calibration will be required as unpredictable social and commercial pressures impact the input variables over time.

The following factors were modelled as the key determinants affecting the supply and demand balance for plant-based meats in Australia:

- Price of plant-based meat (wholesale and retail)
- Share of plant-based meat imported into and exported from Australia
- Total conventional meat and plant-based meat consumption, by consumer group
- Percentage of Australians who are vegan, vegetarian, and flexitarian
- National population growth

From the current baseline level of economic contribution, the three scenarios address conservative growth, moderate (current growth trajectory) and accelerated growth in the supply of, demand for and economic contribution made by the plant-based meat sector. Additionally, this growth will partly be influenced by the level of R&D and capital investment.

*For definitions and complete methodological details, please refer to the glossary and appendices of the full Deloitte Access Economics report.



The Alternative Meat Co.

	2018-19		2030	
	Current Market	Scenario 1 (Conservative)	Scenario 2 (Moderate)	Scenario 3 (Accelerated)
Direct Value-add (\$)	\$5.0M	\$184M	\$528M	\$1.3B
Indirect Value-add (\$)	\$24.9M	\$214M	\$614M	\$1.6B
Total Value-add (\$)	\$29.9M	\$398M	\$1.1B	\$2.9B
Direct Employment (FTE)	104	698	2,004	5,105
Indirect Employment (FTE)	161	1,402	4,023	10,251
Total Employment (FTE)	265	2,100	6,026	15,356
Australian Consumer Expenditure (\$)	\$150M	\$1.4B	\$2.9B	\$4.6B
Value of Australian Exports (\$)	n/a	\$47M	\$338M	\$1.37B

Figure 6. Key Findings: Economic Modelling of Australia’s Plant-Based Meat Sector

SCENARIO ONE CONSCIOUS CONSUMERS' CHOICE

The first scenario, termed 'conscious consumers' choice' represents a conservative growth trajectory to 2030. This scenario sees the rate of growth continue at a slower rate than has recently been observed, with Australian plant-based meat manufacturing stagnating due to subdued levels of domestic R&D and supply relying heavily on imports. Under this scenario, limited local product manufacturing reduces the economic impact of the sector, as local manufacturing is the key determinant of employment, value-add and export potential.

By 2030, a compound annual growth rate (CAGR) of 30 percent from the 2018-2019 baseline is modelled, demonstrating growth from the current position, but plateauing after a time to reflect moderate export and consumer demand and limited R&D investment.

A total of \$184 million in value-add to the economy will be achieved directly in 2030 from the activity of the sector through the generation of income on the factors of production, with a further \$214 million generated indirectly. A total of 698 FTEs will be directly employed, with a further 1,402 indirectly employed across Australia.

Under this scenario, annual Australian consumer expenditure on plant-based meat will total \$1.4 billion, with Australians consuming an average of 2.4kg of plant-based meat each year (equivalent to 46g per week, or about half of one plant-based burger patty) per person. This scenario assumes the share of plant-based meat will remain at just 2.5 percent of total meat products consumed (conventional or plant-based), with an average retail price of \$20 per kg. The share of the Australian population identifying as 'flexitarian' is assumed to rise to 30 percent, which is similar to levels within new market research by Colmar Brunton in 2019 in which 20 percent of Australians are currently flexitarian, with another 12 percent identifying as meat-reducers.³

Under this scenario, Australia will manufacture approximately 47,000 tonnes of plant-based meat annually, with imported products totalling approximately 28,000 tonnes, used to meet approximately 40 percent of domestic consumer demand. Only a small amount of domestically produced plant-based meat will be exported, approximately 4,700 tonnes valued at \$47 million per year, equating to 10 percent of sales for local manufacturers.

Reflecting minimal local R&D investment, reliance on imports and limited consumer demand, this scenario models conservative growth:



2.5%

PLANT-BASED SHARE OF TOTAL MEAT PRODUCTS CONSUMED



\$1.4B

IN DOMESTIC SALES



2,100

FULL-TIME EQUIVALENT JOBS



10%

OF PRODUCT EXPORTED

SCENARIO TWO POPULAR AND ACCESSIBLE ALTERNATIVE

The second scenario, termed ‘popular and accessible alternative’, sees the plant-based meat sector in Australia continue to grow strongly to 2030, with domestic demand primarily met by local brands and manufacturing, complemented by a number of imported products. Australia will become a net exporter of plant-based meat products. The outcomes modelled under this scenario are realised through strong local R&D, which supports competitive local manufacturing, in addition to continued consumer demand.

An equivalent CAGR of 43 percent growth in value from the 2018-2019 baseline to 2030 is modelled. A total of \$528 million in direct value-add will be generated in 2030 from the factors of production, with a further \$614 million of indirect contribution. A total of 2,004 FTEs will be directly employed, with a further 4,023 indirectly employed across Australia.

Annual consumer expenditure on plant-based meat in this scenario will rise to \$2.9 billion by 2030, with Australians consuming an average of 6.1kg of plant-based meat each year (equivalent to 118 grams per week, or about one plant-based burger patty) per person. Plant-based meat will comprise approximately 7.5 percent of the total volume of all meat products consumed, with an average retail price of \$16 per kg. Under this scenario the share of the Australian population identifying as ‘flexitarian’ is assumed to rise to 40 percent, driving increased demand for plant-based products.

This scenario sees domestic manufacturing produce 169,000 tonnes of plant-based meat each year, a volume sufficient to meet 70 percent of local demand, with the balance met by imports of 54,200 tonnes. Under this scenario, exports account for 25 percent of total sales for local manufacturers, and constitute a valuable new export category equivalent to 42,200 tonnes valued at \$337.5 million per year.

Reflecting **significant local R&D investment** driving **competitive manufacturing** and **substantial exports**, coupled with **solid local consumer demand**, this scenario models **moderate growth**:



7.5%

PLANT-BASED SHARE OF TOTAL MEAT PRODUCTS CONSUMED



\$2.9B

IN DOMESTIC SALES



6,000

FULL-TIME EQUIVALENT JOBS



25%

OF PRODUCT EXPORTED

SCENARIO THREE MASS MARKET COMMODITY

Under this high growth scenario, termed ‘mass market commodity’, plant-based meat products emerge as a dietary staple, partly underpinned by a decline in Australians’ consumption of conventional meat as some consumers switch to more plant-based foods, including meat alternatives. Plant-based meats will provide a source of protein for between four to six meals per week for at least 50 percent of the population. A strong level of R&D underpins this scenario, allowing major brands to manufacture significant volumes of plant-based meat products domestically and establish a robust export presence.

This scenario assumes an equivalent CAGR of 58 percent growth in value to 2030 from the 2018-2019 baseline. A total of \$1.35 billion in direct value-add will be generated in 2030 from the associated factors of production, with a further \$1.56 billion of indirect contribution. A total of 5,105 people will be directly employed, with a further 10,251 indirectly employed in upstream activities.

Under this scenario, annual consumer expenditure will rise to \$4.6 billion by 2030, with Australians consuming an average of 15.5kg of plant-based meat each year (equivalent to 299 grams per week, or about 2.5 plant-based burger patties) per person. Under this scenario, plant-based meat will comprise approximately 20.8 percent of the total volume of all meat products consumed, with an average retail price of \$10 per kg, and represents significant progress towards targets set out in the 2019 EAT-Lancet report, which detailed the diet necessary to live within planetary boundaries by 2050.⁴ The share of the Australian population identifying as ‘flexitarian’, and actively seeking alternatives to conventional meat, rises to 50 percent.

This scenario sees domestic manufacturing produce 688,000 tonnes of plant-based meat each year, sufficient to meet 90 percent of domestic demand, with the balance met by imports of 45,900 tonnes. Exports will account for 40 percent of annual sales for local manufacturers, equivalent to 275,200 tonnes, valued at \$1.4 billion per year. This value is approximately comparable to Australia’s 2017-2018 seafood exports. Under this high growth scenario, Australia will be expected to establish major export markets throughout the Asia-Pacific.

Reflecting **substantial local R&D investment** driving **competitive manufacturing** and **a major export industry**, as well as **strong local consumer demand** underpinned by **shifting attitudes towards conventional meat**, this scenario models **strong growth**:



20.8%

PLANT-BASED SHARE OF TOTAL MEAT PRODUCTS CONSUMED



\$4.6B

IN DOMESTIC SALES



15,400

FULL-TIME EQUIVALENT JOBS



40%

OF PRODUCT EXPORTED

COMPARATIVE SECTORAL SIZE

The distribution of economic activity and associated employment across Australia’s states has been modelled on the presence of existing food manufacturing facilities, enabling plant-based meat companies to building upon existing plant and machinery, workforce skills and supply chain infrastructure.

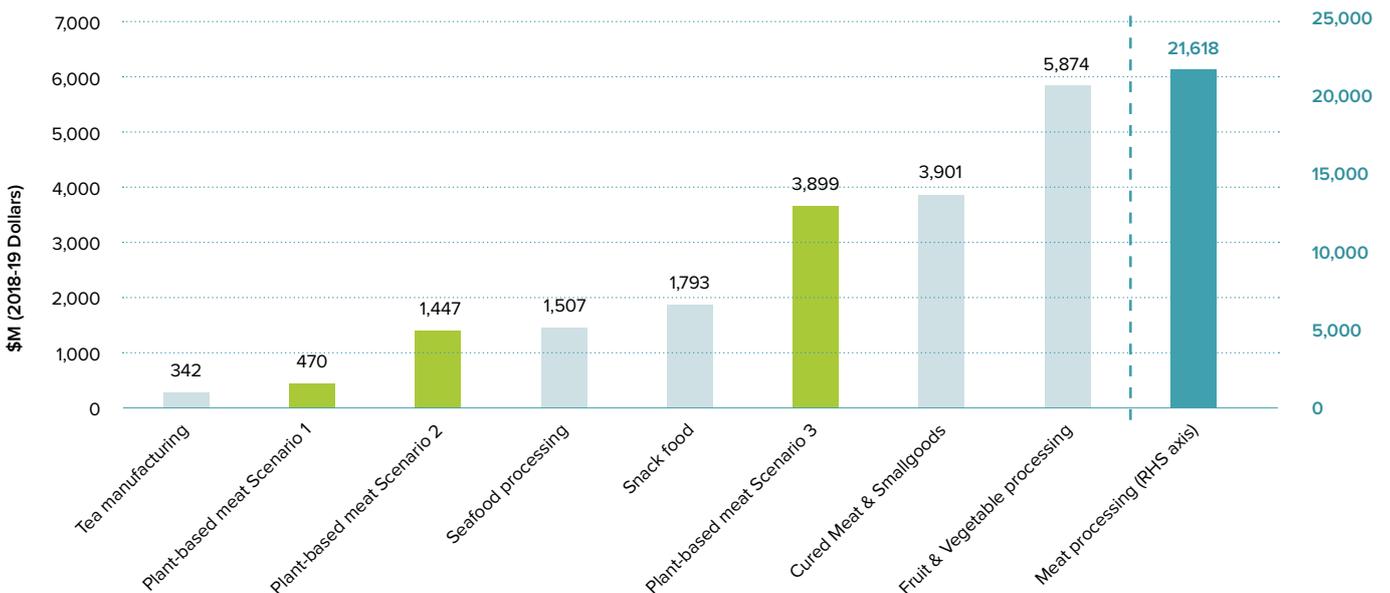
The ‘conscious consumers’ choice’ scenario sees the plant-based meat manufacturing sector grow to generate an annual level of revenue comparable to that of the \$342 million Australian tea manufacturing sector. The tea manufacturing sector employs approximately 740 people (as a headcount, not expressed in FTEs), and comprises approximately 65 processing facilities. Textile manufacturing is another comparable industry, with revenue of \$431 million in 2017-2018.⁵

The ‘popular and accessible alternative’ scenario sees the sector grow to generate an annual level of revenue comparable to that of the \$1.5 billion Australian seafood processing sector.

The seafood processing sector employs approximately 2,500 people, and comprises 239 processing facilities. Other comparable Australian industries include aquaculture and log sawmilling, which each generated revenues of \$1.6 million in 2017-2018.⁶

The ‘mass market commodity’ scenario sees the sector grow to generate an annual level of revenue comparable to that of the \$3.7 billion Australian cured meat and smallgoods sector. The cured meat and smallgoods sector employs approximately 7,500 people, and comprises approximately 250 processing facilities. Other comparable industries include fertiliser manufacturing (revenue of \$3.8 billion in 2017-2018) and glass and glass product manufacturing (revenue of \$4.1 billion in 2017-2018).⁷

Figure 7. Revenue from manufacturing in 2030 – plant-based meat and food manufacturing



Source: Deloitte Access Economics, adapted from IBISWorld

STATE-BASED CONTRIBUTION

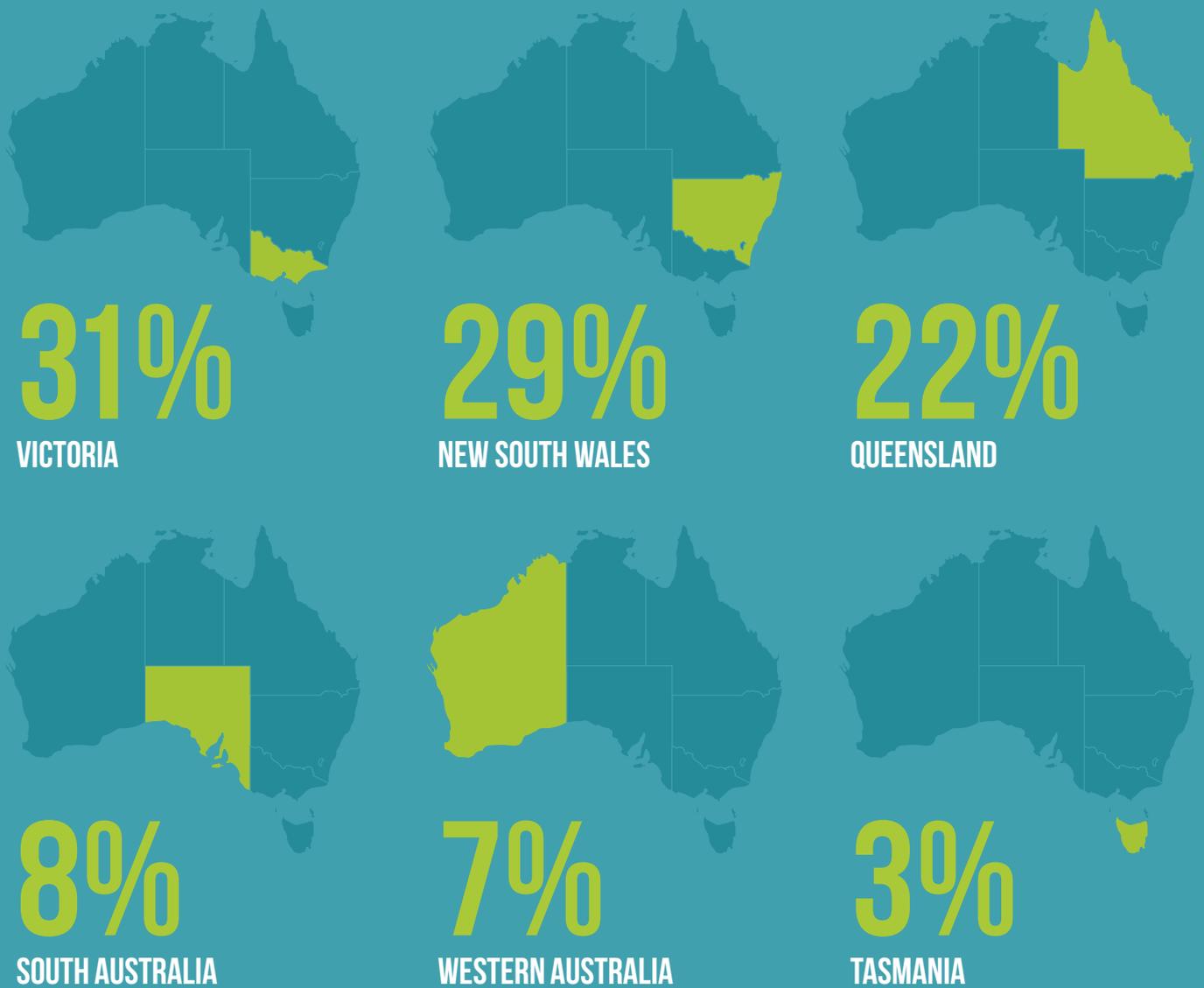


Figure 8. State-wide share of direct value-add and employment distribution

Plant-based meat manufacturing is likely to expand in areas where food manufacturing already occurs, enabling some companies to utilise existing plant and machinery, workforce skills and supply chain infrastructure. Should this occur, and activity in the plant-based meat sector were to mirror that of Australian food manufacturing more broadly, the impact on state-level economies can be inferred.

Distribution of direct value-add (manufacturing) and consequent direct employment is strongly weighted towards the eastern states of Victoria (31 percent), New South Wales (29 percent) and Queensland (22 percent), although all states stand to benefit to some degree, while the two territories have negligible food manufacturing sectors. These outcomes do not reflect additional incentives states could introduce in coming years to attract and retain the new industry, which may further influence the distribution of benefits.

Figure 9. Potential direct value-add for three scenarios (\$m), 2030

Source: Deloitte Access Economics analysis of ABS Census of Population and Housing 2016

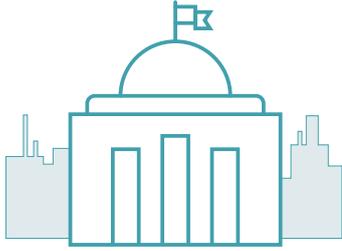
	Share	Scenario 1	Scenario 2	Scenario 3
New South Wales	29%	53	153	390
Victoria	31%	57	164	417
Queensland	22%	41	116	296
South Australia	8%	15	42	108
Western Australia	7%	13	37	94
Tasmania	3%	6	16	40

Figure 10. Potential employment distribution for three scenarios – direct employment (FTEs), 2030

Source: Deloitte Access Economics analysis of ABS Census of Population and Housing 2016

	Share	Scenario 1	Scenario 2	Scenario 3
New South Wales	29%	202	572	1,456
Victoria	31%	216	625	1,592
Queensland	22%	154	432	1,101
South Australia	8%	56	161	411
Western Australia	7%	49	134	343
Tasmania	3%	21	67	170

THE PATH FORWARD



Realising the potential economic opportunities set out in this report will require action at the research, policy and investment levels, as well as from stakeholders throughout the supply chain – from agriculture to food processing to retail.

Food Frontier has identified a range of opportunities that will allow Australia to capitalise on its potential, and leverages its unique intellectual, infrastructure and natural assets to lead in the global plant-based meat sector. Collectively, these sector-wide interventions can ensure a robust, competitive and value-adding domestic industry that contributes to employment, economic growth and efficient resource usage. Food Frontier has based its recommendations on the most likely outcome, ‘popular and accessible alternative’ (scenario 2), which projects continued strong growth of the plant-based meat sector to 2030.

GOVERNMENT AND REGULATORS

Governments in Australia can play a vital role in helping to achieve the sector’s potential, just as federal and state governments have previously assisted the development of many young industries by supporting foundational R&D, infrastructure and sectoral capacity development.

Coordinated R&D funding through designing sector-specific collaborative research initiatives would enable researchers to develop intellectual property and market-leading products that establish Australia as a globally competitive centre for plant-based meat innovation. This action would help ensure the level of R&D required under the ‘popular and accessible alternative’ modelling scenario for continued industry growth.

Competitive and matching grant programs and tax incentives can be valuable tools to support the emerging sector. Specifically, incentivising investment in ingredient processing and product manufacturing will address Australia’s primary bottleneck of scaling-up capacity. Modelling suggests that Victoria (31%), New South Wales (29%) and Queensland (22%) will benefit most from the sector’s direct value-added economic contribution and employment generation based on their existing food manufacturing industries. By leveraging incentive mechanisms, an opportunity exists for a state to establish itself as the epicentre for Australia’s potential \$1.1 billion plant-based meat manufacturing sector by 2030.

Regulators are responsible for ensuring that consumers can easily differentiate plant-based meat products. Marketing for this category typically incorporates qualifiers such as ‘veggie’ or ‘plant-based’, which speak to the products’ origin and ingredients, in conjunction with commonly understood terms that speak to the product’s format and intended utility, such as ‘sausages’ and ‘mince’. New market research by Colmar Brunton, commissioned by Food Frontier, demonstrates that the vast majority of Australian consumers clearly understand existing product labels for plant-based products and are actively seeking them out at the supermarket.¹ Regulators must continue to ensure a level playing field for new food products and market entrants.



INVESTORS

Increased public and private sector investment in R&D and infrastructure across the supply chain is required to meet anticipated consumer demand, and facilitate both product development and increased manufacturing capacity.

Australia’s Rural Research and Development Corporations (RDCs), particularly the Grains RDC, AgriFutures and Horticulture Innovation Australia, have a catalyzing role to play. RDCs can invest both Commonwealth matched funding and grower levies into R&D projects that optimise their respective commodities for use in the plant-based meats of tomorrow.

By mid-2019, several prominent Australian private sector investors, including Quadrant Private Equity founder Chris Hadley, Blackbird Ventures and CSIRO’s Main Sequence Ventures, had secured stakes in Australian and New Zealand plant-based meat companies. The establishment of an investor syndicate or dedicated alternative proteins fund could enable a greater number of investors to enter the sector, facilitating more capital investment across an increased range of plant-based meat ventures.

Diverse opportunities that appeal to different investor types – from angel investors and venture capitalists, to impact investment groups and well-established meat and FMCG businesses – are present across the supply chain. Investments in R&D and protein processing operations, to product manufacturing, packaging and marketing, are essential to drive sectoral growth.



SCIENTISTS

Scientists and researchers will play a fundamental role in the long-term success of Australia’s plant-based meat sector, with opportunities for scientific excellence across the entire supply chain, from farm to factory to fork.

The plant kingdom, including Australia’s native flora, offers a multitude of proteins and other possible ingredients for use in plant-based meat products. With only 0.1 percent of edible plant species currently utilised for human consumption worldwide,² plant biologists and food scientists can lead in the exciting field of protein exploration and characterisation, including harnessing Australia’s unique native flora to pioneer new plant-based meat products. These findings could allow companies to use plant proteins beyond traditional sources like soy and wheat, enabling Australian growers to supply a new range of primary inputs.

As current methods for identifying plant compounds that meet functional product requirements can be resource intensive and time consuming, an opportunity also exists to create automated testing and artificial intelligence screening methods. Additionally, by leading efforts to optimise existing ingredients such as legumes for use in plant-based meats, including trait expression through selective breeding, researchers can open up new value-added uses for Australian agricultural products.

Many overseas plant-based meat companies have relied on building internal expertise to formulate new products, drawing on a far greater talent pool in their respective markets than Australia has available within its own domestic labour market. To effectively scale Australia’s nascent sector to one that is internationally competitive, domestic research institutions can establish R&D partnerships with commercial entities. This may include partnerships with start-ups or established food manufacturers that lack technical know-how creating plant-based meats, similar to CSIRO’s partnership with v2food to create a beefless burger for Hungry Jacks.

This has been demonstrated in the United States, with Beyond Meat working alongside universities and research centres to continually improve their product, opening a 26,000 square foot dedicated R&D facility in Los Angeles in 2018.³ University of California Berkeley in 2017 even established an alternative meat innovation course.⁴

FARMERS

Australia’s current local production of crops such as pea (152,000 tonnes p/a) and soy (51,000 tonnes p/a) – widely used as protein sources in many current plant-based meat products – is limited. Opportunities exist to leverage other high-protein crops widely grown in Australia, such as faba beans (217,000 tonnes p/a), lentils (323,000 tonnes p/a), lupins (693,000 tonnes p/a) and chickpeas (282,000 tonnes p/a).⁵

Domestic plant-based meat manufacturers currently import protein concentrates and isolates to compensate for limited local ingredient supply. As domestic manufacturing increases, demand for locally grown ingredients will incentivise greater investment in domestic protein isolation operations, explored further in ‘Ingredient Processors’ (as follows).

Greater processing capacity will open opportunities for Australian growers to redirect produce such as legumes and grains – a significant portion of which are currently destined for the global commodity market – into the new high-value domestic plant-based meat supply chain, thereby taking market share from imported protein sources.

Additionally, growers have a potentially lucrative opportunity to grow and supply new optimised crops into the plant-based meat supply chain, capitalising on manufacturers’ demands for nutritionally, texturally and taste-optimised produce, and consumer preference for locally grown ingredients.

Increasing demand for other crops including grains, oil crops and vegetables such as mushrooms and beetroot will provide additional opportunities for growers, as these ingredients are used in plant-based meat products to achieve taste and functional qualities such as colour, texture, and flavour, in addition to bolstering nutritional value.

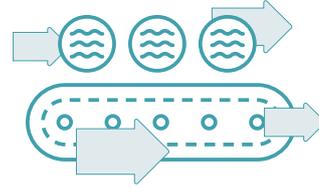
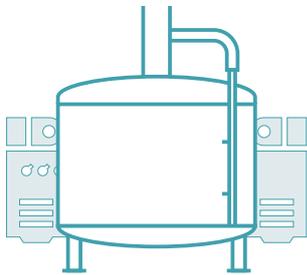
The research presented in this report identifies the potential size of the market for plant-based meats. However, growers would benefit from additional future research by both RDCs and state agencies to understand the commodity mix needed in the market of 2030. Tailored grower educational programs would enable production of the right volume and variety of crops, in the right growing conditions, as ingredient demand for plant-based meat production increases.



INGREDIENT PROCESSORS

Current domestic protein isolation capacity is insufficient to meet existing demand. New facilities such as the EAT Group's processing plant being established in Horsham, Victoria, with a capacity of 5,000 tonnes per year,⁵ will help address this shortage. However, significant additional infrastructure investment will be required to adequately service the developing sector, which is projected to produce 169,000 tonnes of plant-based meat annually by 2030 under the 'popular and accessible alternative' scenario.

New protein isolation facilities will simultaneously enable Australian growers to supply raw materials into the high-value plant-based meat sector, and enable manufacturers to produce plant-based meat products made from Australian-grown ingredients.



MANUFACTURERS AND START-UPS

As retailers strive to meet consumer demand for domestically produced plant-based meat, several poor quality products with taste and functionality shortcomings have appeared on supermarket shelves, produced by food companies with little experience in the category. Products which fail to meet consumer expectations not only degrade consumers' trust in the brand, but also risk impacting their perception of the category as a whole. Over time, poor quality products will fail to succeed in an increasingly competitive marketplace with new and higher quality entrants.

Manufacturers have an opportunity to establish a first-mover advantage by producing high quality Australian products that meet consumer taste expectations and satisfy increasing demand. Rather than creating new products from scratch, manufacturers can consider leveraging the intellectual property (through joint ventures, acquisitions or licensing arrangements) of plant-based meat companies in the United States, Europe and elsewhere that have developed high quality, advanced product formulations.

Manufacturers can also improve the decades-old techniques and machinery often used by many in the industry by developing advanced plant-based meat manufacturing processes. Companies such as Sunfed Meats in New Zealand have demonstrated that pioneering custom production methods can achieve unique textural qualities.⁷

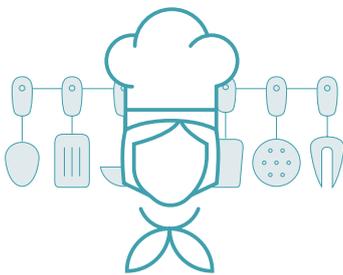
Opportunities also exist for co-packing facilities and the development of scalable, modular equipment for ingredient processing, quality control and automated production that can be leveraged or licensed by multiple producers with similar requirements.

Internationally, accelerators have emerged that specifically support the growth of new plant-based and alternative protein companies, such as Europe's ProVeg's Incubator⁸, Purple Orange Ventures' fellowship program in Berlin,⁹ and Big Idea Ventures' Singapore-based accelerator program.¹⁰ Australian food and agtech accelerators such as Sydney-based Cicada GrowLabs¹¹ and Melbourne-based Rocket Seeder¹², could incentivise domestic innovation in plant-based meat by adapting their programs to emulate similar accelerators.

EXPORTERS

Australian-made plant-based meat can benefit from the same 'high quality, trusted, safe' perception enjoyed by the broader Australian food sector internationally. Markets across the Asia-Pacific continue to demonstrate a strong appetite for plant-based products, with new vegetarian and vegan product launches in South East Asia between 2012 and 2016 increasing by 140 percent and 440 percent respectively.¹³

The combination of growing demand for healthier, sustainable options in Asian markets, positive consumer sentiment towards Australian products,^{14, 15} lack of existing domestic plant-based meat exports and increased domestic investment into the sector, presents an immediate export opportunity for Australian-made plant-based meat products as an extension of the meat category. Exporters can leverage existing distribution channels for conventional meat into export markets to ensure an efficient path-to-market for Australian plant-based meat products internationally.



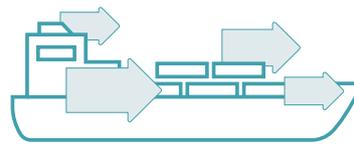
RETAILERS, CHEFS AND FOODSERVICE GROUPS

Retailers, restaurateurs and foodservice groups will capitalise on significant growth in demand for plant-based meat products, with consumer retail expenditure anticipated to reach \$2.9 billion by 2030 in the 'popular and accessible alternative' scenario. Retailers and foodservice can maximise this opportunity by stocking and promoting the growing range of plant-based meat products consumers are seeking. As product innovation advances, a greater selection of high quality plant-based meat options that cater to a range of consumers will be required, opening up further opportunities for category expansion.

Retailers and foodservice groups can play an important role in showcasing Australian-made products and those with limited market exposure, such as plant-based seafood products. International plant-based meat brands have demonstrated that restaurant partnerships and collaborations can be effective in launching new products and building consumer loyalty to both the brand and restaurant alike. A prominent example of this strategy was seen in the United States, with Impossible Foods' partnership with the high-end Momofuku restaurants generating significant interest, prior to their roll out to major fast food chains such as Burger King. Similar opportunities exist in an Australian context.

Chefs play an important role in shaping public opinion on new food trends, and are well-placed to champion the culinary versatility, taste and health benefits of plant-based meats. The inclusion of plant-based learning modules in food courses, such as those in Vocational Education and Training (VET) and Technical and Further Education (TAFE), would support chefs and food industry professionals to understand how plants can be used to create familiar meaty dishes, subsequently building the long-term knowledge and capability of the sector.

Through product development and culinary creativity, whether developing wholefood meat-mimic products such as pulled jackfruit or adapting new plant-based meat products for new and traditional dishes, chefs play a fundamental role in redefining the nexus of taste and sustainability.



CONSUMERS

While new generation plant-based meats are still new to many consumers, Colmar Brunton research indicates that one in three Australian consumers have already tried it. Encouragingly, an additional 28 percent of consumers had yet to try it but would like to.¹⁶

Providing consumers with accurate educational materials and using clear and unified product messaging is required to build understanding of this category, including knowledge of the nutritional value of plant-based meats. Clear explanation of ingredients and production methods will help demystify how these products are created and counter misconceptions about some products being 'unhealthy' or 'unnatural' purely on the basis of processing. Individual plant-based meat brands can also support informed consumer decision-making through the provision of high quality, nutritious products underpinned by educational marketing.

CONCLUSION

This paper has provided the facts and figures demonstrating the vast opportunity facing Australia; growing a new industry from \$150 million today into a \$1.1 billion manufacturing and almost \$3 billion consumer sector, employing over 6,000 Australians, and benefiting every state in the nation.

Australia stands at a critical inflection point, having entered a new global age of near-limitless technological innovation, recreating many of the traditional ways society produces and consumes goods and services. Our nation can choose to hide from the inevitable disruption facing the food and agriculture sector, with outcomes ultimately dictated by external forces, or alternatively, boldly embrace the change which is upon us. We must leverage our unique strengths and resources to fundamentally shape the food system for future generations.

Against a backdrop of potentially devastating climatic shifts, severe public health challenges, growing population and the global threat of food and water insecurity, Australia must champion solutions that work for both people and the planet. With the global food demand of 2050 expected to be 50 percent greater than today, alternative proteins not only offer a value-add to farmers, but are both complementary to Australia's existing food system and essential to feeding the global population in coming decades.

Plant-based meats present Australia with a multi-billion dollar opportunity. Will we seize it?

Our nation already has the intellectual and infrastructure assets to become a plant-protein powerhouse. With the right political and economic will, Australia can fulfil its potential to build a globally competitive, multi-billion dollar industry.

Let's get to work.

Acknowledgements

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World-first research requires world-class thinking and leadership. Food Frontier is grateful to the dedicated team of authors and researchers who commissioned this research and wrote this paper, led by Sam Lawrence, Food Frontier's Managing Director. Together, we are building a food system that is good for people, great for business and better for the planet.

Advisors

[The Good Food Institute](#)

Images

[The Alternative Meat Co. \(incl. cover image\)](#)

[Impossible Foods](#)

[Beyond Meat](#)

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An aerial photograph of a vast agricultural landscape. A dirt road runs diagonally from the bottom left towards the center. To the right of the road is a dense line of trees. The rest of the landscape is a vast, flat expanse of green and yellow fields, likely crops, under a bright sky with some clouds. The overall tone is warm and golden.

Our nation already has the intellectual and infrastructure assets to become a plant-protein powerhouse.

With the right political and economic will, Australia can fulfil its potential to build a globally competitive, multi-billion dollar industry.

ENDNOTES

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