Strategic Drivers of the Queensland Beef Supply Chain

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Executive Summary

'Strategic Drivers of the Queensland Beef Supply Chain' is part of the independent document series 'Investment Outlook for the Queensland Beef Supply Chain' developed by EY on behalf of the Queensland Department of Agriculture and Fisheries. It explores the value proposition of the Queensland beef sector by highlighting competitive advantages, demand drivers as well as the domestic and international trends for industry participants and prospective investors.

Queensland Competitive Advantage

Queensland is renowned for producing high quality, safe and reliable beef. The industry adheres to world-leading animal welfare practices that meet domestic and international demand for ethically produced food. The industry has robust biosecurity and a relative disease free status. Australia pursues a free trade agenda with international agreements in place to continue to grow market access for Queensland producers. This includes accomplished relationships with key trading partners such as China, Japan and the Republic of Korea. These competitive advantages combined with the close association and geographical proximity to Asia, positions Queensland to meet future demand growth in the existing and emerging beef markets.

Trends in Global Beef Consumption

Demand for Australian beef is impacted by three key global macro drivers of beef consumption. These macro drivers are:

- Population Growth: global population growth will drive an increasing demand for beef, particularly within Africa and Asia.

- Rise of the Middle Class: two-thirds of the global middle class will be in the Asia-Pacific region by 2030.

- Increased Urbanisation: urbanisation drives the consumption of livestock proteins through infrastructure development, such as improved transport options and cold chains.

These macro drivers are forecast to increase Asia's beef consumption by 13% to 22.3 million tonnes by 2025 (BMI Research). Demand for Australian beef is also impacted by fluctuations in the exchange rate of the Australian dollar.

Australia's Position in the Global Beef Market

While Australia only accounts for 2% of the global beef cattle herd (ABS), it is consistently one of the top three global exporters of beef and veal. Queensland's beef cattle sector accounts for 67% of the national export value. In 2016, Australia was the world's highest value beef exporter, despite only having the third highest volume of exporters. This indicates the higher premiums paid for Australian beef and its access to premium markets.

The global beef market is impacted by a number of other exporting nations. These nations include:

- India: increasing buffalo meat production is providing a cheaper alternative but does not compete in high-value markets due to bovine disease and poor quality control.

- United States: the domestic herd has been in a rebuilding phase following drought in 2012 with beef production forecast to increase in 2018.

- Brazil: one of the biggest global producers of beef but has had recent food safety concerns resulting in import bans and other restrictions.

Queensland Beef Sector

Queensland has a robust and diverse beef cattle industry that supports the largest beef sector of all Australian States. Beef cattle production is split into northern, central and southern systems. These systems generally use different management methods and breeds due to their large climatic differences. The Queensland herd is currently rebuilding after a significant size reduction trigger, caused by high cattle prices and severe drought conditions from 2014 - 2016. This prolonged drought has prevented the industry from entering a growth phase.

The Queensland beef processing sector has the opportunity to leverage digital innovation and data analytics to improve the prediction of production levels and enhance communication along the supply chain. This will allow processors to better predict their throughput and more efficiently and effectively schedule their operations in collaboration with producers. Queensland's current processing capacity is responsive to the cyclical nature of the industry and is sufficient to meet forecast volumes.

Queensland infrastructure is extensive and enables the effective transport of cattle throughout the State. Although road restrictions limit weight and truck types in some areas, the road system is extensive and sophisticated, with the type 1, type 2 and B Double network spanning the eastern seaboard and key inland routes.

There are also many specialist livestock trucking operators with deep experience in the effective transportation of cattle, and who operate under animal welfare standards. The cattle road transport sector uses a quality management system called TruckCare. The program addresses animal welfare, meat safety, traceability, Occupational Health and Safety (OH&S) and biosecurity risks.

Services provided on the network are subsidised. This initiative contributes to safer roads through a reduction in heavy haulage traffic, provides an alternative to trucking, and is also a more sustainable method of transportation.

As the beef cattle industry expands with increasing demand for Australian beef, so will its supporting services industry. Services supporting the beef industry include transport providers, agronomics, business support, branding, assurance and advisory services.

Technology

Technology is a key driver of both productivity and value for beef producers. Support for the development and commercialisation of innovative solutions is essential to enhance industry sustainability, productivity and value. Universities and the CSIRO have played an active role in researching and developing solutions to improve the quality and consistency of beef produced, as well as reducing the labour and input intensity of the operations. Examples of these solutions include; embryo transfer, gene mapping and advancements in cattle nutrition supplementation. The implementation of these technologies allow Queensland to produce beef at a low cost. However, the cost of meat processing or feedlotting is not advantageous in comparison to overseas competitors, due to differences in factors such as costs of labour. These factors mean Queensland needs to be at the forefront of technological advancement, research and innovation to maintain competitive costs of production while achieving price premiums. Leveraging emerging technologies will be an essential tool to enhance transparency of the end-to-end supply chain and traceability of product from the paddock to the plate.

Queensland's Competitive Advantages

Queensland is the largest beef producer in Australia

Queensland has a robust and diverse beef cattle industry with multiple market options and an extensive supporting infrastructure

Queensland Beef Industry Statistics

42% Queensland's cattle herd is almost half of the national herd

702,462 tonnes Of red meat exported from the Port of Brisbane in 2017

This is **42.5%** of the national total and makes Brisbane the largest red meat export terminal
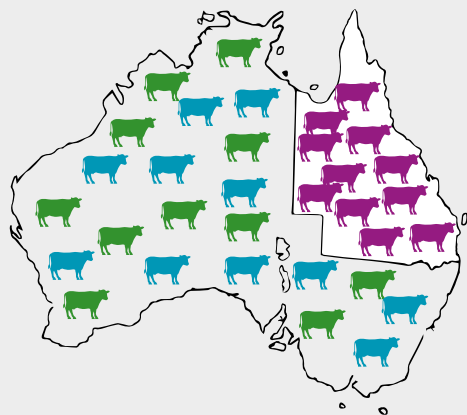
The Port of Townsville was Australia's second largest live export terminal by volume with a throughput of **204,000 head**

11.04 million Total head of cattle in 2017

1.70 million head turned off from feedlots in 2017

3.40 million head processed in 2017

Source:
ALFA, ABS, DAWR & ABARES, 2018

The Port of Brisbane was Australia's largest export terminal for processed red meat, exporting 702,462 tonnes,

42.5%

of the 2017 national total.

Queensland was the leading exporter of live cattle with

218,087

head in 2017. The Port of Townsville is Australia's second largest live export port.

Source: ABS

Queensland is renowned for producing high quality beef.

Queensland's:

▸ extensive free range grazing pastures;

▸ strict biosecurity; and

▸ well-managed environment, create the foundation for its strong international reputation.

Australia has a well-established international reputation as a:

▸ reliable;

▸ safe;

▸ sustainable; and

▸ healthy, source of beef.

This is underpinned by 'True Aussie Beef', a brand developed by Australian producers which allow beef exports to be marketed under one Australian brand. Australia's reputation gives confidence to consumers and commands a price premium.

Research and development, innovation, and education programs continue to promote industry leading practices throughout the beef cattle supply chain. This ongoing progression further differentiates the Australian industry. Geographic isolation from other countries and its strict biosecurity practices is key to Queensland remaining free from the world's most serious bovine diseases; including foot and mouth disease and bovine spongiform encephalopathy (mad cow disease).

World-leading animal welfare standards.

Consumers are demanding ethically produced food and are showing increased awareness of animal welfare issues. Australia has a strong reputation in this regard and pursues a number of initiatives to maintain Queensland's reputation in the global market for safe, ethically produced and high quality beef.

Queensland utilises the National Livestock Identification System (NLIS) as a mechanism to provide traceability of livestock. This enhanced ability to track cattle should there be a disease incident is a key enabler of Queensland's market access requirements and assists in tracing cattle to their property of origin.

The Australia Lot Feeding Association (ALFA) offers accreditation under the National Feedlot Accreditation Scheme (NFAS). NFAS requires feedlots to be independently audited every year and supports continual improvement in production, environmental management and the welfare of cattle.

The Australian Standards for the Export of Livestock (ASEL) and Exporter Supply Chain Assurance System (ESCAS) are world-leading and aimed at maximising the welfare of animals throughout the live export supply chain. There is an international push for other nations to follow Australia's example.

Queensland's reputation for the ethically produced high quality beef under a stringent biosecurity framework is leveraged by the industry in export markets. As demand for beef continues to increase and consumers become more discerning, these positive, differentiated characteristics will become increasingly important and valuable.

Queensland's practices align with trending global drivers.

The Queensland beef industry is highly regarded for its extensive grazing pastures, exemplar animal welfare standards, strict biosecurity practices and continuous investment in research, development and innovation. As the global market expands and the middle class of Asia and the United States continue to grow, there will be an increase in demand by consumers for high quality, healthy, sustainable and humane products. Queensland's beef industry is positioned to align with these trending drivers and exploit future opportunities.

Trends in Global Beef Consumption

Macro drivers of beef consumption ---- **Population growth** ---- **Rise of the middle class** ---- **Increased urbanisation**

Global population growth will drive an increasing demand for beef

The global population will continue to grow, with a forecast increase of 571 million people over the seven years to 2022 (BMI Research). This growth is a key driver of beef demand. Levels of growth are country dependant. African and Asian populations are expected to grow at faster rates, while those in Europe, the US and Russia will generally grow at lower rates.

By 2030 two-thirds of the global middle class will be in Asia-Pacific.

The middle class is defined as people who earn enough to have a disposable income that allows them to buy luxury items such as cars, televisions, and other goods. Table 1 compares 2015 data to 2022 forecasts to illustrate the changing global demographics. Table 1 includes the increasing wealth of households in key Asian markets.

By 2022, China will have an additional 19.12 million households with a disposable income greater than US$35,000. Japan will have an additional 16.65 million households with a disposable income greater than US$35,000 and 12.03 million additional households earning substantial disposable income

(>US$50,000 USD).

There is a correlation between increasing incomes and a rapid demand increase for livestock products as a preferential source of protein (Joint WHO/FAO 2003). Beef is perceived as a premium source of protein and is a high-value food that provides a range of essential micronutrients and minerals, as well as a desired taste (Joint WHO/FAO 2003). As a result, an increase in its consumption is correlated with an increase in wealth.

Urbanisation further drives animal protein consumption.

Globally, 54% of the population live in urban areas. This is forecast to increase to 57% by 2022. Urbanisation drives the consumption of livestock proteins through infrastructure development, which allows perishable goods to be traded and a more diverse diet to be achieved (Joint WHO/FAO 2003).

Queensland's geographic location and production of high quality beef leaves it well placed to take advantage of the growth in Asia's middle class and its increasing consumption of livestock protein.

These macro drivers are forecast to increase Asia's beef consumption by 13% to 22.3 million tonnes by 2025

In recent years, Asian countries have been a major source of increased global beef and veal imports. In 2016 Asia consumed 25% of all beef globally. This is forecast to increase to 30% by 2026 (OECD-FAO 2017).

Future demand for Queensland beef is to be driven primarily by the increased protein consumption of the growing middle class in Asia. Table 1 demonstrates the increase in meat consumption in Australia's key export markets.

In addition to the growing demand for meat,

increased wealth and education is shifting consumer preferences towards environmentally friendly, ethical, and safe produce (Joint WHO/ FAO 2003). Australia's clean and green brand is key to it differentiating itself from competitors so it can maintain and increase its share of the growing premium markets in Asia (BMI Research).

Table 1: 2015 – 2022 forecast increase in key macro drivers for select countries

	Population		Urbanisation		Household Disposable Income >35,000USD			Household Disposable Income >50,000USD			Beef and Veal Consumption			
	2015-2022 Growth	Change	2015	2022	2015	2022	Growth	2015	2022	Growth	2015	2022	Change	Change %
	'000 People				% of Pop	% of Pop	'000 h'holds	% of Pop	% of Pop	'000 h'holds	'000 tonnes	'000 tonnes		
Japan	-2,278	-2%	94%	96%	35%	64%	16,647	16%	37%	12,033	1,186	1,278	92	8%
US	16,221	5%	82%	83%	68%	75%	11,810	50%	59%	13,590	11,274	12,676	1,402	12%
South Korea	1,224	2%	83%	83%	63%	86%	6,005	30%	60%	7,102	770	828	58	8%
China	34,821	2%	56%	63%	2%	6%	19,118	1%	2%	7,862	7,358	9,079	1,721	23%
Indonesia	19,263	7%	54%	59%	1%	4%	2,507	0%	2%	1,117	714.7	1,026	312	44%
Hong Kong	398	5%	100%	100%	42%	52%	428	27%	36%	344	400	543	143	36%
Asia	236,771	6%	47%	51%										
World	571,008	8%	54%	57%										

Source: BMI Research

Demand for Australian beef is impacted by changes in the Australian dollar exchange rate.

As all export beef is traded in US Dollars, changes in the value of the Australian dollar can directly influence the demand for Australian beef. A depreciation in the Australian dollar with respect to the currencies of our trading partners, allows Australian beef to be more competitively priced internationally without impacting exporters' margins. This results in higher demand for Australian beef and an increase in export volumes. Correspondingly, an appreciation in the Australian dollar will result in higher export prices and a reduction in demand.

Figure 1: Foreign exchange rate and the over-the-hooks indicator of MSA grainfed 100 day Steers

OTH ¢/kg cwt — A$1=USD
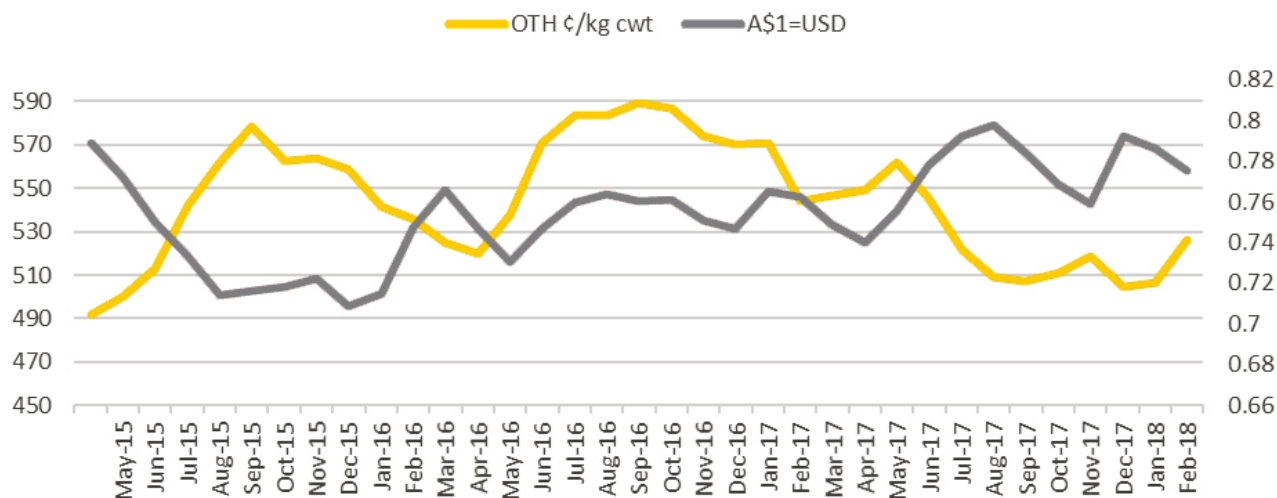
The increase in annual beef and veal consumption in Australia's key export markets is forecast to be 3.7 million tonnes from 2015 to 2022 (BMI Research). Based on EY's analysis of BMI Research data and the application of an indicative 55% live weight to carcase weight yield, this increase in consumption equates to an additional requirement for 17 million 400kg animals. To put this demand increase into perspective, Queensland's total herd size in 2017 was 11.04 million.

Since **2010** overall
**global exports have increased 21% to
9.4 million tonnes
in 2016**

Australia is consistently one of the top three global exporters of beef and veal despite having only 2% of the global beef cattle herd. In 2016 Australia was the world's highest value beef exporter, despite having the 3rd highest volume of exports. Australia's export value was significantly higher than India and Brazil (which are the top two exporters by volume). This is indicative of the higher premiums paid for Australian beef and its access to premium markets.

Queensland producers comprise a significant proportion (67%) of the national beef export value. Queensland leverages Australia's clean and green reputation to meet the growing demand for its beef from the United States and Asia's emerging and increasingly urban middle class. In doing so, Queensland has firmly established itself as the producer of choice for high quality beef.

The 2012 drought in the United States impacted the global market

In 2014 export peaks were experienced in India, Brazil, and Australia. These peaks were driven by a global demand increase, particularly from China. However the United States was not able to address this demand due to shortened supply during drought conditions.

From 2012 to 2014 global beef exports increased by 1.2 m tonnes (cwt) (ABARES).

This increase in demand was primarily driven by the Chinese and United States markets. The United States import demand was driven by limited domestic supply due to the previous year's drought conditions and subsequent herd rebuilding, whereas China's demand was driven by growth in its middle class.

Figure 2: The Australian and United States beef cattle herds
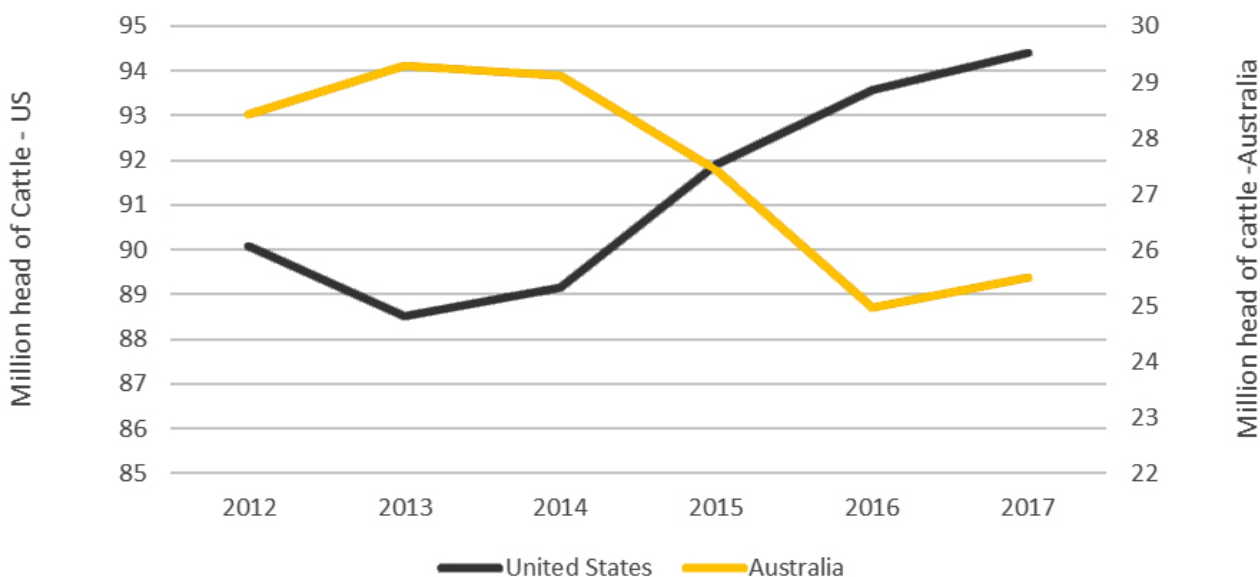
The global market is impacted by a number of other exporting nations

India's increasing buffalo meat production is providing a cheaper alternative.

India has the world's largest cattle herd and is a producer of carabeef, a large proportion of which comprises water buffalo. However, India does not compete with Australia in high-value markets due its Foot and Mouth Disease (FMD) status and poor quality control. However, India is a strong competitor to Australia's exports into the Indonesian market. India's average beef export price in 2016 was US$3.90 per kg, compared to Australia's US$5.26 per kg. Indonesia's Constitutional Court ruled in early 2017 that meat from countries prone to FMD could only be imported under emergency circumstances, but this ruling only lasted one month (ABC Rural 2017). Australia's higher quality beef is being blended with Indian water buffalo meat in the production of Indonesia's staple food bakso balls (ABC Rural, 2017). ''The entry of Indian buffalo meat into the Indonesian market in mid-2016, combined with high Australian cattle prices and the Indonesian government policies to achieve self-sufficiency, is considered to have impacted Australian live cattle and beef box shipments in 2017'' (MLA Industry News 2018).

United States of America has been re-building its herd since 2014.

Although the United States is one of the largest importers of Australian manufacturing beef, they are also one of the largest global exporters. The United States' herd is in the final stages of a re-building phase with beef production forecast to increase in 2018. Domestic consumption is forecast to also increase, which will absorb some of this production growth; however the excess will flow into export markets creating increasing competition. The United States currently competes with Australia in our key high-value markets of Japan and Korea.

Brazil is one of the biggest global producers but has had food safety concerns.

Brazil faces limitations in market access due to ongoing food safety controversies, resulting in import bans or significant restrictions into the US, China, and European markets. However in the last four months, numerous trading partners have begun to progressively lift import restrictions imposed on Brazil. Market access is becoming more prominent for Brazil with increasing negotiations taking place with China, Indonesia and Europe, although concerns of food safety still remain an ongoing issue. Brazilian exports are forecast to increase over the short-term as a result of decreased domestic consumption due to ongoing recession and increasing production. Brazil's average export price in 2016 was US$4.04 per kg lower than Australia's (MLA Industry Insights). Brazil competes with Australia in our key market of China.

Australia is consistently in the top three exporters world wide

Australia's Position in the Global Beef Market

Figure 3: Beef export volumes (kt cwt) from 2010 - 2016 of the five largest exporting countries
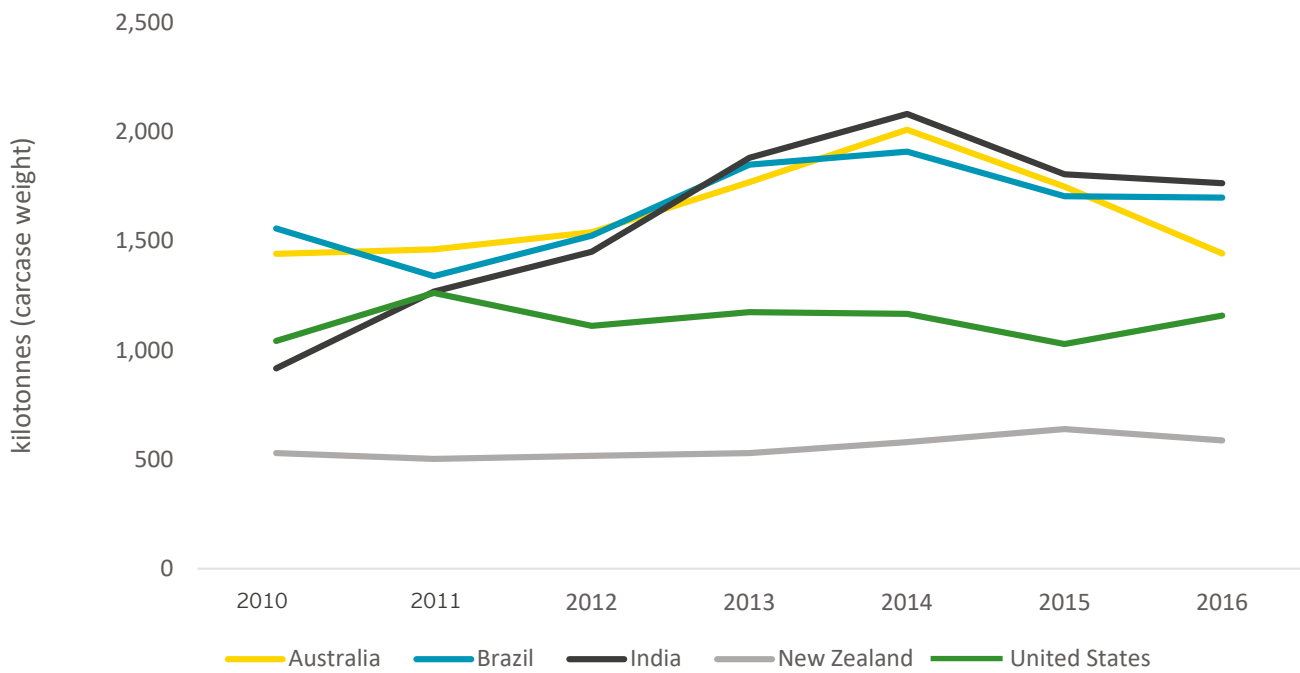
Source: ABARES

Figure 4: Value of beef exports in 2012 - 2016 (USD)
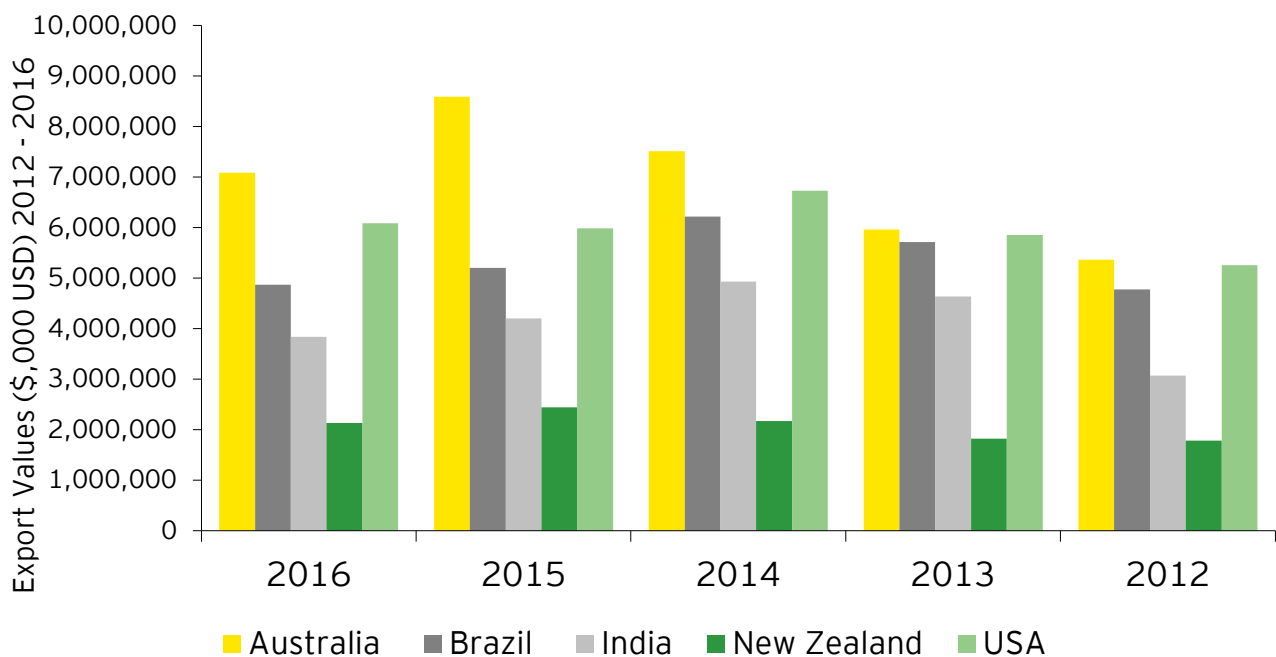
Source: UN Comtrade Database

The majority of Australia's beef exports go to Asia and the United States

Figure 5: Australia's beef exports in 2017 – Tonnes shipped weight

USA
Total: 234,112
- Chilled grassfed: 58,318
- Chilled grainfed: 5,423
- Frozen grassfed: 168,840
- Frozen grainfed: 1,531

EU
Total: 17,873
- Chilled grassfed: 3,965
- Chilled grainfed: 13,382
- Frozen grassfed: 12
- Frozen grainfed: 515

Middle East
Total: 29,220
- Chilled grassfed: 7,012
- Chilled grainfed: 5,010
- Frozen grassfed: 14,749
- Frozen grainfed: 2,449

Legend:
- Chilled grassfed
- Chilled grainfed
- Frozen grassfed
- Frozen grainfed

218,087 head
Queensland's total live cattle exports in 2017

552,107 tonnes cwt
Queensland's total beef and veal shipped in 2017

Source: DAWR

China

3,560
2,486
79,985
24,029

Total: 110,059

Hong Kong

1,825
1,513
2,650
1,702

Total: 7,691

Korea

8,748
24,960
86,240
28,604

Total: 148,552

Japan

28,474
88,908
121,833
53,149

Total: 292,364

South East Asia

6,340
2,896
42,649
9,636

Total: 61,521

Taiwan

3,381
1,597
25,307
825

Total: 31,110

Indonesia

3,048
704
45,469
478

Total: 49,698
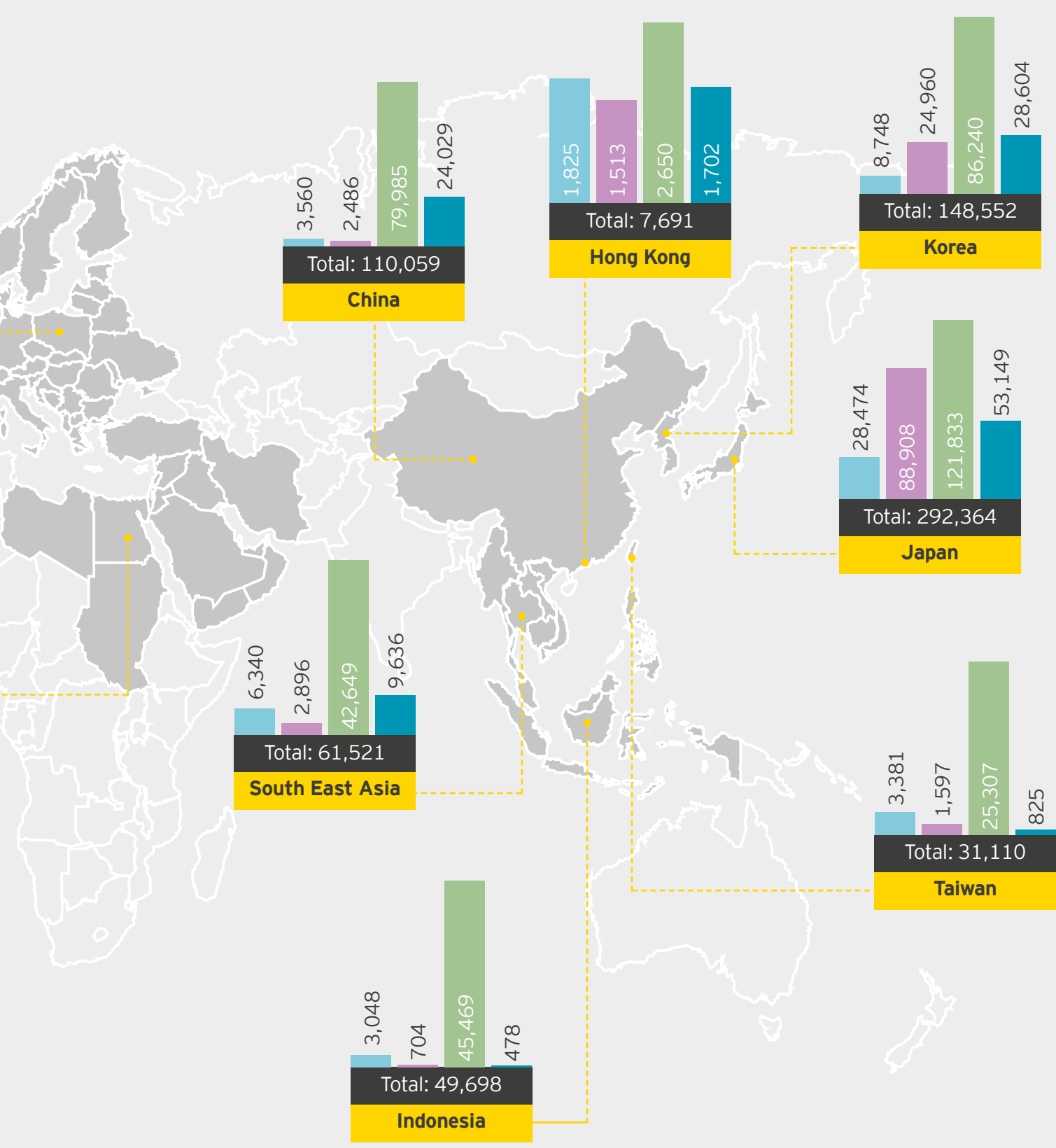
Figure 6: Australia's beef exports in 2017 – Top 3 foreign importers

Japan

- 10% Chilled grassfed
- 18% Chilled grainfed
- 42% Frozen grassfed
- 30% Frozen grainfed

US

- 25% Chilled grassfed
- 1% Frozen grainfed
- 2% Chilled grainfed
- 72% Frozen grassfed

Korea

- 6% Chilled grassfed
- 17% Chilled grainfed
- 58% Frozen grassfed
- 19% Frozen grainfed

Legend:
- Chilled grassfed
- Chilled grainfed
- Frozen grassfed
- Frozen grainfed
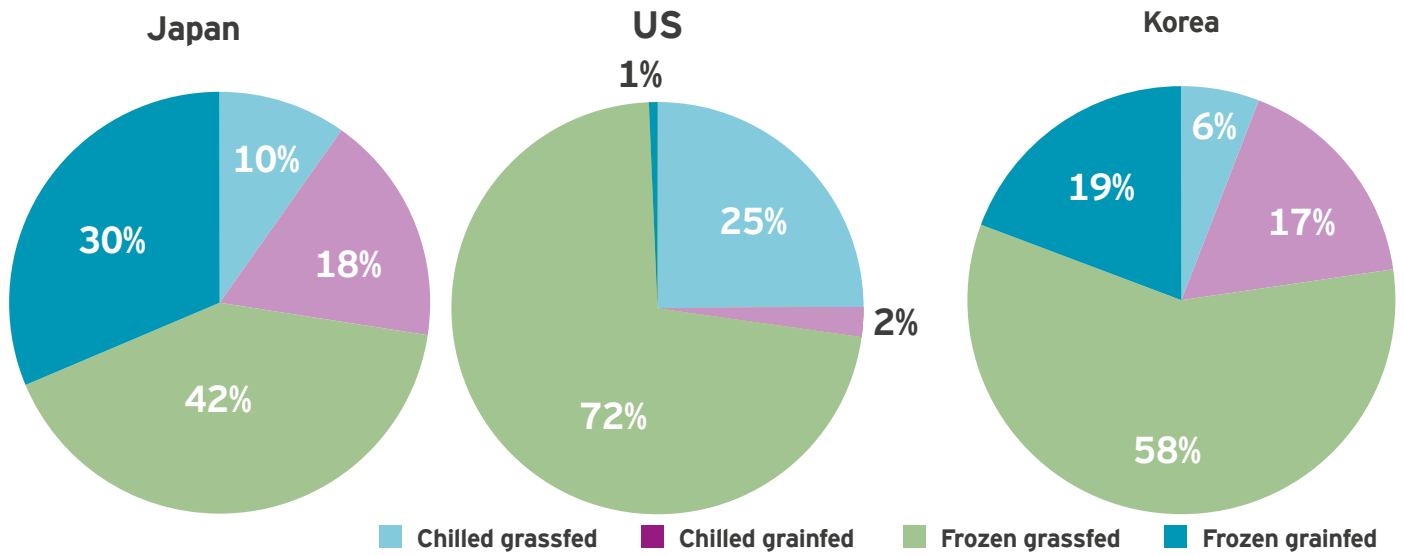
Australia's live cattle exports by destination

head in 2017

Total 876,766

Indonesia	Vietnam	Japan	Korea
514,390	169,180	15,284	177,912
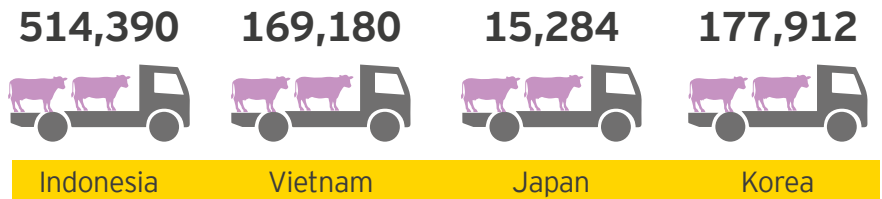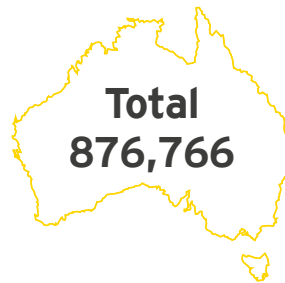
Source: ABS

Australia's key markets align to four of the world's largest beef importers

Table 2: Top 5 beef importing countries by volume – beef and veal meat

Imports kt (cwt)	2010	2011	2012	2013	2014	2015	2016
United States	1,042	933	1,007	1,020	1,337	1,529	1,367
China	40	29	95	412	417	666	818
Japan	721	745	737	760	739	707	719
Russian Federation	1,058	994	1,027	1,023	932	621	522
Republic of Korea	366	431	370	375	392	414	513
Rest of World	3,427	3,467	3,488	3,855	4,073	3,694	3,752
Total	6,654	6,599	6,724	7,445	7,890	7,631	7,691

Source: ABARES

United States consumers want access to grassfed beef.

Although the level of imported beef is forecast to decline in 2018 due to increased domestic production, the United States is expected to continue being a major market for Australian grassfed beef.

The United States' domestic market is dominated by grainfed beef production – only 3% of beef produced is grassfed, compared to Australia's portion of 62% (Joint Stone Barns Center for Food and Agriculture, Bonterra, and SLM 2017, ABS and ALFA). 97% of Australia's beef exports to the US is grassfed. Consumers are becoming increasingly aware of grassfed beef and associating it with better animal welfare, health qualities, and a higher value product (MLA Industry Insights). While the majority of grassfed beef exported to the US is manufacturing beef for hamburgers, there is an increasing appetite for high-grade grassfed chilled beef. The consumer shift towards ethically conscious healthy eating, creates a market opportunity for Australia's grassfed premium cuts. The scale of Australia's extensive grazing pastures provides an advantage over the other major exporters to the US including New Zealand, Canada and Mexico.

Japan cannot meet the demand for Wagyu.

Australia has a strong brand presence in Japan with 98% of buyers aware of Australian beef and 40% aware of the "True Aussie Beef" brand. Wagyu beef is a traditional breed of cattle in Japan and is in high demand. Due to Japan's high population density, Wagyu production is constrained and domestic production does not meet domestic demand. Australia meets this excess demand, with 32% of beef consumed in Japan in 2017 being imported from Australia (MLA Industry Insights). Australia's trade agreements with Japan place it at an advantage over its key competitor, the US.

Australian producers have invested in the True Aussie Beef brand, with a specific focus on Japan, North America and Korea. This brand helps consumers identify authentic Australian beef and maintains Australia's reputation for quality and safety.

Free trade agreements will continue to improve market access

Australia pursues a free trade agenda and has bilateral agreements in place with its key trading partners

What this means for our beef industry

- A more influential competitive position
- Greater access to the global market
- Potential attraction of foreign investment
- Reduced fluctuations in trade
- Growing innovation practices
- Exploitation of export opportunities

The close relationship and geographic proximity to Asia is key to future demand.

Asia's growing middle class will be the largest source of food demand growth over the next 10 years with a forecast **45%** increase in consumption over this time (OECD-FAO 2016).

Queensland's geographic proximity to Asia means producers are able to benefit from relatively low freight costs and transport times. This presents a competitive advantage over other exporting nations, particularly in the expanding high end chilled beef market segment which is experiencing increased demand due to its perceived higher quality.

China (ChAFTA – effective 20 December 2016)

Key outcomes include elimination of:

- the tariffs on beef imports (ranging from 12-25 per cent) by 1 January 2024
- the 12 per cent tariff on beef offal by 1 January 2022.

The ChAFTA creates a competitive advantage over almost all other large beef exporters. Key competitors Brazil, Uruguay, Argentina, Canada and the United States of America face:

- 12% tariff on meat
- 20% tariff on chilled carcases/ half carcases
- 25% tariff on frozen carcases/ half carcases.

New Zealand was the first developed country to enter into a FTA with China in 2008. All tariffs on New Zealand beef have been eliminated as a result of this FTA.

Other Australian FTAs include:

- New Zealand – ANZCERTA
- Singapore – SAFTA
- United States – AUSFTA
- Thailand – TAFTA
- Chile – Australia-Chile FTA
- The ASEAN-Australia-New Zealand Free Trade Area – AANZFTA
- Malaysia – MAFTA.

The Comprehensive and Progressive Agreement for Trans-Pacific Partnership (TPP-11) was signed by 11 countries on 8 March 2018 and is moving to be implemented by the respective parties. The TPP-11 will benefit the Australian beef industry through further reduction and elimination of tariffs. Around 33% of Australia's beef exports go to TPP-11 markets, worth $7.8 billion in 2016-17.

The key market access for Australian beef arising from the TPP-11 includes:

- Japan – The tariff reduction in the JAEPA will be further reduced to 9% within 15 years
- Canada – Elimination of the 26.5% tariff on beef imports over 5 years
- Mexico – Elimination of all Mexican tariffs on Australian beef within 10 years, these tariffs are currently up to 25%.

The Republic of Korea (KAFTA – effective 12 December 2014)

The KAFTA will help Australia compete against the United States in the Korean market. The United States' beef imports have had lower tariffs than Australia since 2012.

The KAFTA outcomes include:

- Elimination of Korea's 40% tariff on Australian beef products by 1 January 2028. In 2018 Australian beef imports will face a 26.6% tariff

- Elimination of Korea's 18% tariff on offal and 72% tariff on processed beef products by 1 January 2028

- Volume restrictions will apply, once a volume trigger is reached tariffs will increase back to 40%.

In comparison the United States will have 0% tariffs by 2026 under the KORUSFAT.

Japan (JAEPA – effective 15 January 2015)

- Australia is the first major agricultural exporter to secure a bilateral trade agreement with Japan

- Australia and key competitor the United States of America both faced tariffs of 38.5% on beef imports, however the JAEPA immediately reduced tariffs on Australian imports and will phase them to a further reduced rate over 10-18 years. The United States of America does not have a FTA with Japan and still faces tariffs of 38.5%.
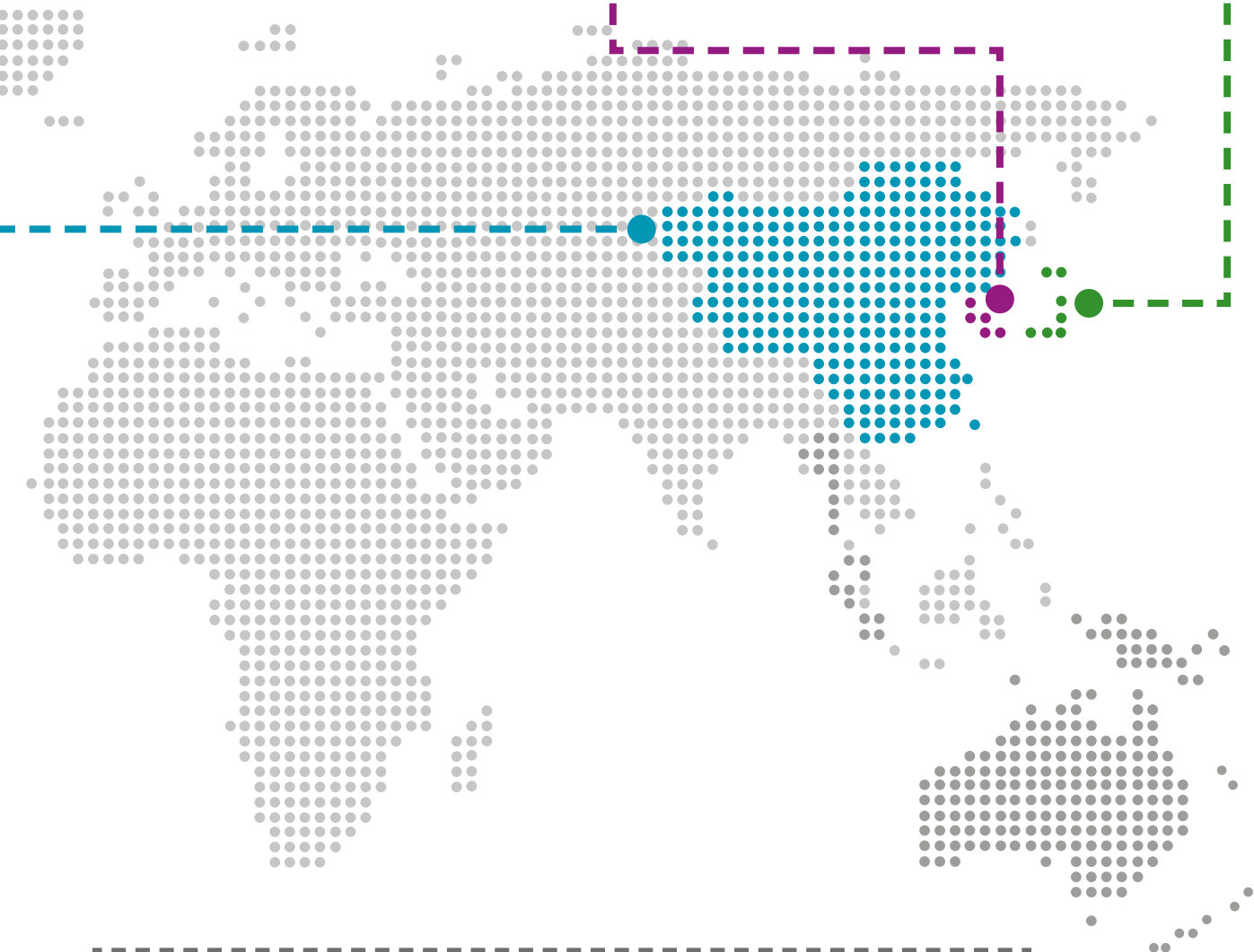
FTA's that are under negotiation with our other key trading partners include:

- Indonesia - IA-CEPA

- Hong Kong - A-HKFTA

- Middle East – GCC-Australia FTA

Source: DFAT

Queensland's Beef Sector

Queensland is the largest beef producer in Australia. Queensland's beef industry has diverse beef cattle production systems, multiple established and emerging market options and extensive infrastructure along the supply chain to support the industry.

Queensland's grazing and production systems

There are two key production systems in Queensland which produce cattle for either live export or domestic processing.

There are three key grazing regions in Queensland defined as Northern, Central and Southern.
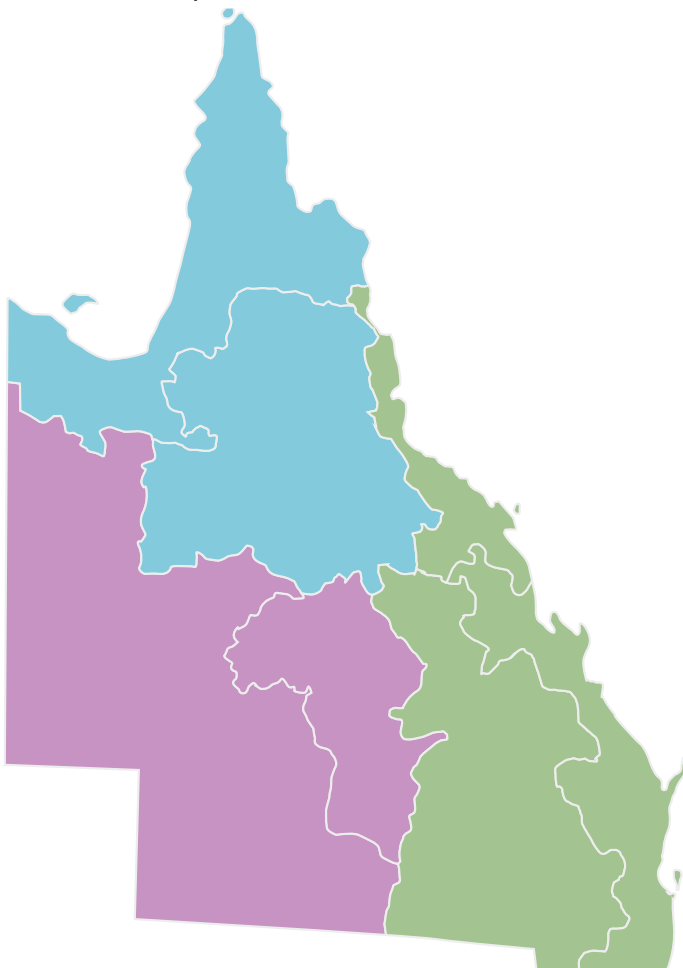
Northern grazing properties allow for the low cost production of cattle through breeding on large marginal grazing pastures.

Central grazing properties are commonly used for backgrounding cattle. With breeding and finishing operations also common.

Southern properties are characterised by smaller properties with intensive grazing areas.

Dominant bovine species

Bos Taurus	
	Of British and European decent
	Best suited to temperate climates
	Produces a high yield of beef
	Produces high marbling and tenderness in beef

Bos Indicus	
	Of Southern Asia decent
	Well suited to extreme temperature conditions
	Tick resistant

Northern production systems

Northern Queensland production systems are characterised by extensive grazing pastures dominated by annual wet and dry seasons.

The dry hot conditions of Northern Queensland create a climate more suited to *Bos Indicus* breeds such as Brahman cattle. Their drought and tick resistant qualities allow them to remain productive in long dry seasons. However, their meat is of a lower value in the Australian domestic market and they are often exported live as feeder cattle to Asia markets. Northern cattle that are processed domestically, overwhelmingly cater to the commodity beef market and are processed by Northern and Central Queensland abattoirs.

Northern graziers are increasingly producing cattle suited to domestic and boxed beef export markets. This is achieved through cross-breeding with *Bos Taurus* breeds to create cattle that demonstrate the hardier traits of a *Bos Indicus* animal and the marbling, tenderness and yields of a *Bos Taurus* animal. Examples of these breeds include Droughtmaster and Santa Gertrudis, both of which are well established within Queensland. These cattle are turned off Northern properties after weaning and generally moved to backgrounding properties.

Backgrounding properties allow weaners to grow out to a larger size prior to entering more intensive finishing systems. Backgrounding can also prepare cattle for intensive systems, introducing handling, socialisation and acclimatisation to feed bunkers.

Within the Queensland beef industry the major methods of cattle sales include;

- cattle through saleyards (lwt)
- direct to abattoirs by carcass weight (cwt)
- through online sales platforms (lwt)
- to live export companies (lwt).

Southern production systems

Queensland's Southern grazing properties are characterised by smaller land holdings with intensive farming practices. Southern production systems generally produce *Bos Taurus* breeds such as Hereford, Angus, and Charalois, however these more intensive holdings also span north along the Queensland coastal region capturing the *Bos Indicus* and cross species breeds. The South East region and Rockhampton area provide infrastructure hubs supporting the sale, finishing and processing of cattle.

Saleyards are used heavily in the Southern production systems. Predominantly cattle suitable for domestic market use, restocking properties and breeding purposes are sold through saleyards. Processors are also active buying suitable cattle. Cattle generally go through a finishing system before processing.

Finishing systems are the method of fattening cattle to meet market specifications before they are processed. Cattle are either finished on improved pastures, creating grassfed beef, or in feedlots creating grainfed beef. Finishing systems are focused in the Southern region of Queensland due to the accessibility of grain, higher quality pastures and Bos Taurus cattle. Finishing systems help to create consistency in product and cater for the high value domestic and export markets.

Farm size is generally inversely correlated with productivity – smaller farms tend to be located on more productive land and vice versa. Queensland's south eastern regions are characterised as being more productive and farm sizes are typically smaller in these areas.

Queensland has an extensive infrastructure network supporting the beef cattle supply chain consisting of:

State wide road train network

Rail services capable of transporting live cattle and processed beef containers
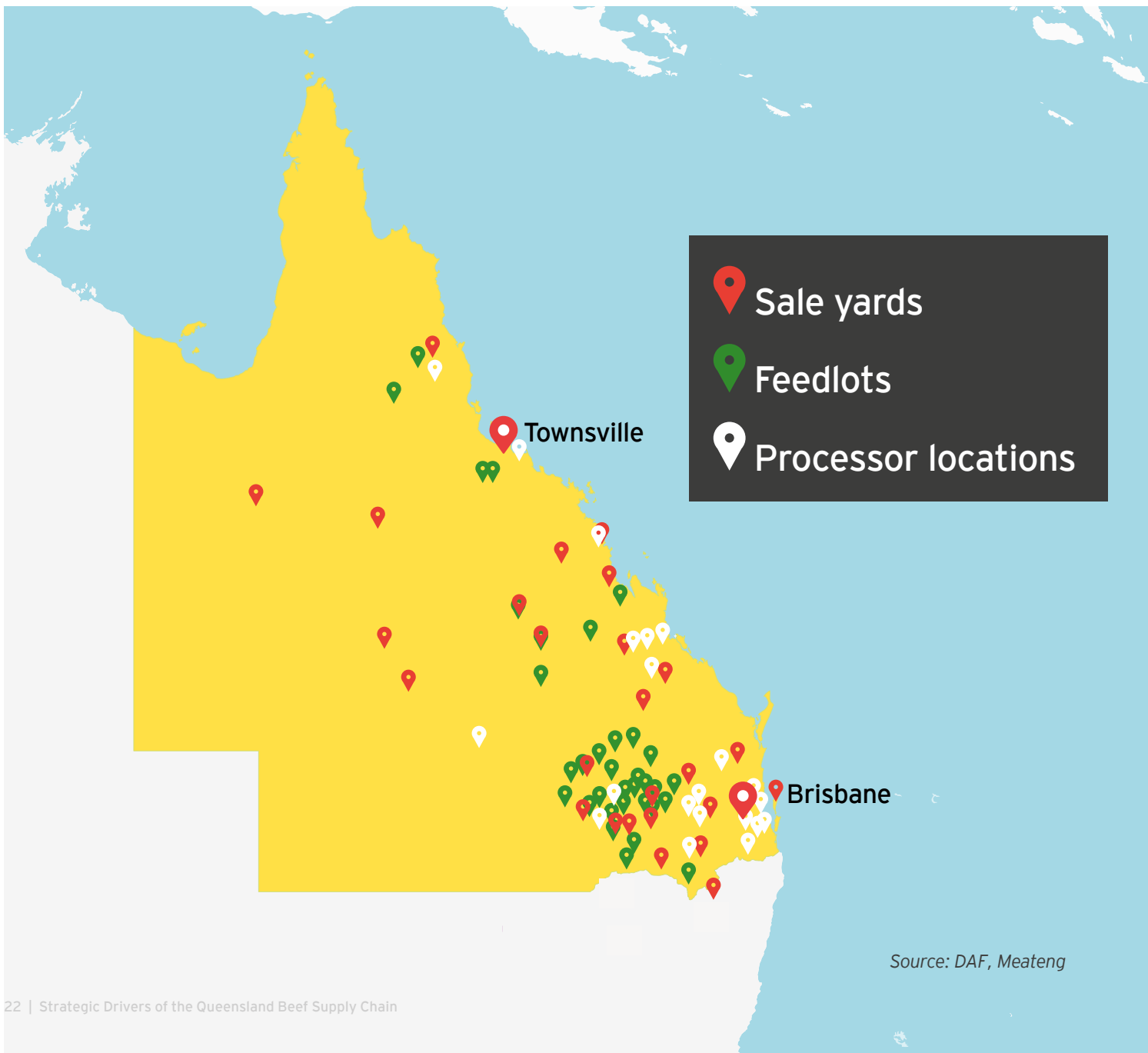
Sale yards

Quarantine inspection and dip stations

Feedlots

Abattoirs

Sea ports

Airports

Townsville

Brisbane

Sale yards

Feedlots

Processor locations

Source: DAF, Meateng

State wide livestock rail network

Livestock Rail Services.

Source: Aurizon

Legend
- Livestock stock check
- Livestock loading yards
- Livestock abattoirs
- City/town
- Pick up location
- Delivery destination
- Potential pick up location
- Livestock rail line
- Existing rail
- Cattle tick free zone
- Cattle tick infected zone

North West corridor
20 tonne axle load

Cairns to Rockhampton
20 tonne axle load

Central Queensland corridor
15.75 tonne axle load

Blackwater to Gladstone
26 tonne axle load

Gladstone to Brisbane
20 tonne axle load

South West corridor
10.75 tonne axle load

15.75 tonne axle load

Queensland's road network spans the State, supported by livestock rail services subsidised by the State Government.

Northern Queensland's turn-off is typically destined for live export channels, supported by the Port of Townsville, Australia's second-largest live export terminal in 2017. Beef cattle in the southern region of Queensland are generally processed domestically with the majority of product being transported to Port of Brisbane by road. Processing and feedlot infrastructure is concentrated in the State's grain growing region with 70% of the State's processing capacity located in the south-east corner. Almost all of Queensland boxed beef exports pass through the Port of Brisbane (ABARES). Queensland is also Australia's leading exporter of beef and veal via air freight making up 50% of the national total in 2017 (ABARES).

Queensland's road network spans across the state.

Queensland's regional road network is generally high quality and high capacity, underpinning the transport of cattle across the State, between properties and facilities. The National Vendor Declaration Program operates in conjunction with the NLIS to provide cattle traceability during transport and make sure of animal welfare standards are complied with at all times.

Recognising the importance of a robust and reliable road network to Australia's beef industry, the Australian Government has committed $100 million to upgrading key cattle transport routes across Northern Australia, improving supply chain resilience (Infrastructure Australia, 2016).

Although the road network is expansive some efficiencies are lost in restricted weight and truck type areas. The location of the Townsville processing plant in a weight-restricted part of the network hampers the productivity and efficiency of beef processing operations, ultimately increasing the costs of transport and production. Much of Central and Southern Queensland suffers a similar problem, with cattle from the Western grazing country potentially facing two changes in transport mode to reach the bulk of Queensland's processing capacity in the south-east corner (ABARES 2015).

Queensland's livestock rail network presents significant opportunities to efficiently transport cattle.

Queensland is the only state with a rail network that supports the transport of cattle, with the potential to move 286,000 head per year at current capacity. Livestock rail services are subsidised by the Queensland Government and provide regular scheduled services at a fixed rate throughout the year. This initiative contributes to safer roads through a reduction in heavy haulage traffic, and is also a more sustainable transportation method. Use of the rail network has been altered by its deregulation, however the Queensland livestock rail services presents significant opportunities for the Queensland beef industry to efficiently transport cattle. Increased rail freight of processed beef also presents an opportunity for the export supply chain, with output from abattoirs across the State occasionally transported by train to the Port of Brisbane (ABARES).

Vertical integration is used to minimise volatility.

Vertical integration is becoming increasingly prevalent as a method to stabilise revenue and productivity. In the past five years, three of Australia's largest beef producers – Australian Agricultural Company (AACo), Australian Country Choice (ACC) and the North Australian Pastoral Company (NAPCO) – have all either restructured or completed acquisitions to capture greater value along the supply chain. Vertical integration allows for greater control of inventory levels along the supply chain, reducing supply and off-take risk. Large scale operators that vertically integrate leverage this benefit.

In 2014, 80% of Queensland was drought declared leading to a rapid and significant reduction in its cattle herd. Drought conditions continued throughout 2015 and 2016 hindering the ability of the industry to enter a herd rebuilding phase. Queensland and Australia's herd is forecast to increase in 2018 during the herd rebuilding phase.

The impact of this drought on Australian herd numbers and the Eastern Young Cattle Indicator (EYCI) can be seen in Figure 6. Towards the end of the drought period in 2016 the herd size dropped to a twenty year low (MLA), and consequently prices reached record highs. Certain beef products such as 95CL performed better in the market.

The run down in herd size could have potentially been worse if international demand and prices were not so favourable, especially toward premium products. While cattle prices were at record highs, the primary producer portion of the supply chain were rebuilding herds and generally unable to capitalise on the inflated prices.

The United States is considered Queensland's main competitor in quality beef exports and a major exporter. Consequently, the US herd numbers can impact the Queensland market. The US herd is following a similar cycle, however drought conditions began earlier than Australia's and herd numbers reached their low point in 2013. The United States is expected to finish the herd rebuilding phase in 2018 with production forecast to increase (OECD/FAO 2016, USDA). Although this will create increased competition, the low proportion of grassfed beef in the US, and the growing demand for beef in Asia, means that Queensland's beef is still positioned to be highly sought after.

Image: LATRQ

Figure 7: The impact of drought on the beef cattle market

	Herd numbers		Market prices	
Drought	Producers that cannot feed cattle are forced to sell them due to decreased feed and water	**Herd reduction**	**Low market prices**	Increased supply on the market results in reduced market prices
	Due to reduced herd numbers less calves are produced and a reduction in turn off is seen in subsequent years	**Reduced sale cattle**	**High market prices**	Low production leads to high market prices
Seasonal Recovery	After the property has recovered from drought producers retain heifers to re-build their breeding herd. This further restricts turn-off	**Increased retention of cattle**	**High market prices**	Ongoing shortage of supply maintains high market prices
	After enough heifers are retained the producer's turn off will increase Once the heifers are of breeding age the producer's turn off will further increase to their original capacity	**Increased sale cattle turn off**	**Decreased market prices**	Prices reduce as the supply of cattle increases

Figure 8: Eastern Young Cattle Indicator (EYCI) and Australian herd size

Source: Herd Size - ABS
EYCI - MLA

Queensland's feedlot industry

On average, around 31% of Australia's turn-off comes from grainfed cattle, however this has been growing in recent years with almost 40% of Australian turn-off coming from grainfed cattle in 2017. This growth can be attributed to favourable grain growing seasons exhibited over this period. The increase has also been driven in part as a drought relief activity, where cattle need additional nutrition to add weight before processing. Factors such as feed prices are driving meat processors to become more vertically integrated, including feedlots within their internal supply chain to secure consistent supply.

Lot feeding is a bigger industry in Queensland, than in any other State in Australia, with an average 40%

of turn-off coming from grainfed cattle, increasing to just over 50% in 2017. Queensland is the largest contributor to grainfed beef in Australia, representing 58% of processed beef over the past 5 years (Figure 9).

As the demand for high quality beef from Asia continues to rise it is expected that demand for Australian grainfed beef will also increase. Feedlots in Australia and Queensland are operating at utilisation rates of 75% and 73% respectively as seen in Figure 10. Increasing demand and high utilisation rates are expected to drive the expansion and the development of new feedlots.

Figure 9: Percent of cattle processed that were grainfed in Australia and Queensland
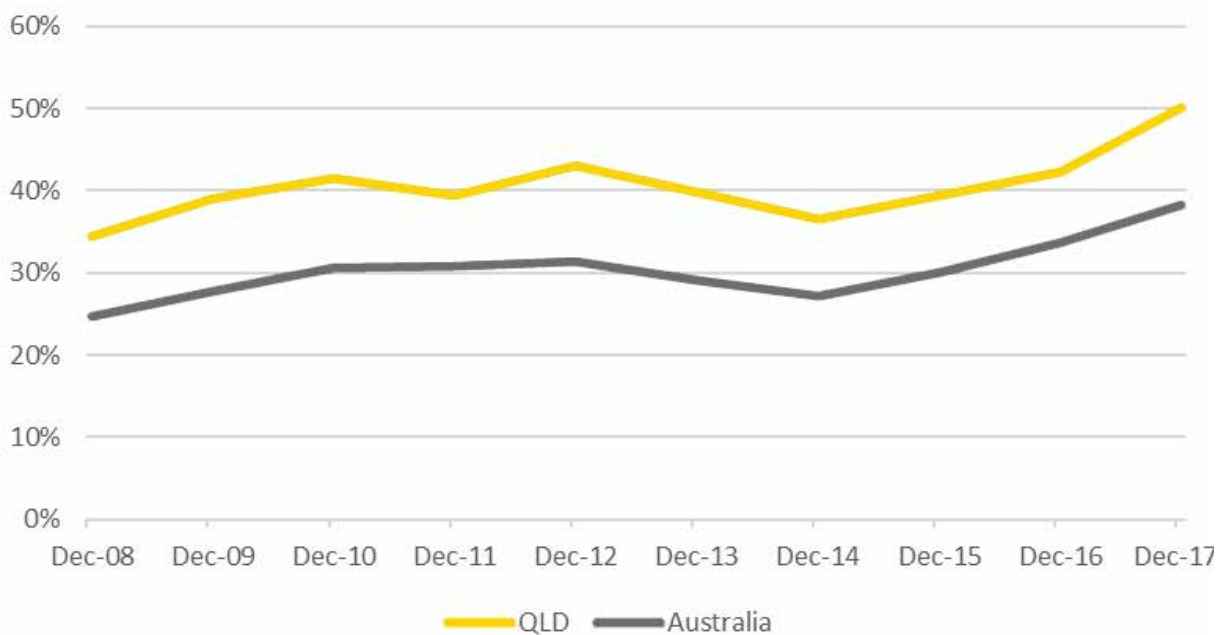
Source: ABS and ALFA

Figure 10: Utilisation of Australian and Queensland feedlots as of December 2017

	Numbers on Feed (head)	Capacity (head)	Utilisation
Queensland	518,749	709,999	73%
Australia	973,176	1,293,623	75%

Source: ALFA

Queensland's current processing capacity is sufficient for forecast volumes

Currently Queensland abattoirs have a combined weekly processing capacity of 390,000 head based on a five day week. This capacity is sufficient the meet the forecast 2022-2023 post herd rebuilding processing volumes. During this time, peak throughput (based on seasonal variability) is forecast to be 385,000 head (Meateng, 2018).

Given the cyclical nature of the industry, processors are required to have capacity to meet demand when there are periods of high turn-off rates, for example in periods of drought. When turn-off declines (for example in periods of herd re-building), processing plants can become underutilised and idle.

Improved prediction of production levels and enhanced communication along the supply chain can be achieved through the adoption of digital innovation and data analytics. These advances will allow processors to better predict their throughput and more efficiently schedule their operations.

A number of the top and mid-tier processors are investigating the implementation of robotic automation and objective carcase measurement to increase the efficiency of their operations. This is an attempt to decrease their cost base and increase their productivity. Processors are also looking to leverage objective carcase measurement as a more effective way of determining the value of the carcase. For meat processing in Australia to remain competitive, management of costs and risks needs to remain a major focus.

Image: ALFA

Queensland has a relative disease-free status with robust biosecurity

Australian beef exports are prized for their clean status. Queensland's biosecurity laws are both stringent and dynamic, to keep pace with ongoing and emerging threats. Quarantine laws at both the federal and state level have been effective in preventing the outbreak of diseases such as Foot and Mouth Disease (FMD) and Bovine Spongiform Encephalopathy (commonly known as mad cow disease). This achievement has provided a competitive advantage over affected markets such as Brazil and the United States, both in terms of higher pricing and market access (Helibron 2010). Australian beef sold for an average of AUD$2 / kg cwt more than Brazilian beef in March 2016, this price was amplified by the ongoing drought and supply shortage at this time (Oldfield 2016).

Seeking to preserve this advantage, farm-specific biosecurity plans became mandatory in Queensland in October 2017 (Amy McCosker 2017). In order to maintain maximum disease-free ratings, which are necessary to preserve market access, these plans must be developed, implemented and regularly reviewed by veterinarians. The Department of Agriculture and Fisheries play an active role in providing alerts and assistance to veterinarians enabling proactive management of biosecurity issues and the promotion of animal health best practice. The Veterinary Surgeons Board of Queensland (VSBQ) requires veterinarians to undertake extensive ongoing education to ensure their knowledge remains up to date in the context of emerging threats and ongoing issues relevant to their specialisation. The strength of Queensland's biosecurity and relative disease free status is a significant contributor to its attractiveness as a global source of high quality beef.

All Queensland cattle are identified by RFID tags that adhere to the National Livestock Identification System (NLIS). This enables lifetime traceability of cattle and contributes to the management and mitigation of chemical residues and potential diseases such as Bovine Spongiform Encephalopathy (Mad Cow disease) and FMD. This in combination with the current biosecurity policies in place act as a testament to Queensland's strict biosecurity practices. The NLIS provides traceability of Australian beef and strengthens the provenance and reputation of Queensland beef products through the digital supply chain in regard to proving natural, healthy and safe beef.

Agricultural services

Queensland is also home to a well-developed agribusiness services industry. Notably, agricultural consulting has emerged as a key component of the beef sector as farmers increasingly seek external, professional advice to optimise their production systems and capitalise on emerging industry trends. Consultants – often former farmers or agricultural academics – may be involved in anything from on-farm infrastructure design to the development of animal health strategies. As technology plays an increasingly important role in beef supply chains, consultants have played active roles in developing logistics and supply chain provenance strategies that both improve the efficiency of beef supply chains, and safeguard the quality of the products valuable to the Australian beef brand. As a key beef exporter and host to several world-class agricultural research institutions, Queensland is well placed to benefit from the demand boom for consulting services as production systems and supply chains become increasingly connected and complex.

Technology

Technology is a key driver of both productivity and value for beef producers

The beef cattle sector is currently subject to the development of a number of technology solutions to drive performance improvement at each stage and along the end-to-end supply chain. MLA, through its innovation acceleration program MLA Donor Company, supports the development and commercialisation of innovative products that enhance the industry's productivity, sustainability and value proposition.

One example of a recently-supported project is a robot that will allow graziers to muster and monitor cattle, as well as assess pasture quality and perform weeding tasks remotely, significantly cutting time spent travelling and performing labour intensive tasks (MLA, 2018).

Universities and the CSIRO have also played an active role in researching and developing innovative solutions to improve the quality and consistency of beef produced, as well as reduce the labour and input-intensity of beef processing.

Beef cattle technology solutions

Trough monitoring applications to determine when cattle require more water.	Moocall – an internet connected device that indicates when a heifer is entering labour. This reduces the chance of complications and human labour costs.	Mixer wagons – feeding wagons that collect and interpret data regarding animal health, and alter feed mix (with the advice of animal nutritionists) to address identified issues.
Walk-over weighing – a system to monitor cattle weights in real time, providing information to aid decision making with respect to animal diets and turn-off.	Digital Homestead – a digital analytics suite that combines data from soil, vegetation, cattle, the environment, livestock markets and weather forecasts to support animal management decisions.	

Many of these technologies can also be applied in feedlots. Automation has also played a key role in the improvement of beef processing procedures, with equipment being developed that boost productivity whilst cutting wastage (Garfield 2016).

Technology is also being deployed to harness and safeguard the value associated with Australia's reputation for safe, high quality beef. Producers are leveraging technologies including blockchain to trace product from the paddock to the plate.

From the producers' perspective, blockchain not only allows them to demonstrate the provenance and quality of their product, but the traceability aspect will help to combat counterfeit Australian beef that threatens to tarnish the country's brand value in key Asian and Middle Eastern markets (Van Extel 2015).

Australia's beef cattle industry is differentiated from its competitors. It is a trusted global supplier of a large volume of high quality beef and live cattle. This unique position is the reason Australia has historically dominated global markets. Given the sophistication of the Australian industry, both in terms of its herd and production systems but also its quality, biosecurity, and disease status, it is ideally placed to take advantage of the growth in global demand for beef. Queensland, as Australia's leading beef state, will be the primary beneficiary of this growth.

Acronyms and Abbreviations

Acronym/ Abbreviation	Definitions
AACo	Australian Agricultural Company
ABARES	Australian Bureau of Agricultural and Resource Economics
ABS	Australian Bureau of Statistics
ACWP	Agricultural Competitiveness White Paper
ALFA	Australia's Lot Feeding Association
ASEAN	Association of Southeast Asian Nations
ASEL	Australian Standards for the Export Livestock
c/kg dw	Cents/kilogram dressed weight
ChAFTA	China-Australia Free Trade Agreement
CSIRO	Commonwealth Scientific and Industrial Research Organisation
Cwt	Carcass weight — The weight of an animal's carcass
DAF	Department of Agriculture and Fisheries
DAWR	Department of Agriculture and Water Resources
DEXA	Dual-Energy X-ray Absorptiometry
ESCAS	Exporter Supply Chain Assurance System
EYCI	Eastern Young Cattle Indicator
FIRB	Foreign Investment Review Board
Grainfed	Meat from animals that are fed grain-based diets during the finishing process
Grainfed	Meat from animals that are fed grain-based diets during the finishing process
ha	Hectare
IVA	Industry Value Added
JAEPA	Japan-Australia Economic Partnership Agreement
KAFTA	Korea-Australia Free Trade Agreement
Kt	Kilotonnes - 1 kilotonne = 1,000 kilograms
Lwt	Live weight of an animal
m	Million
MDC	MLA Donor Company
MLA	Meat & Livestock Australia

Acronym/ Abbreviation	Definitions
MSA	Meat Standard Australia – An Australian standards system developed for the red meat industry, which guarantees eating quality
Muscle & fat score	Muscle score is a method of evaluating the muscularity of an animal. Animals are judged on a scale from A-E. Fat score is a method of evaluating the fat depth of an animal. Animals are judged on a scale from 1-6.
NAIF	Northern Australia Infrastructure Facility
NAPCO	National Australian Pastoral Company
NDVI	Normalised Difference Vegetation Index
NHA	NH Foods Australia
NLIS	National Livestock Identification Scheme
OTH	Over the hooks – is an indicator derived from the pricing grids released weekly by meat processors
QGPI	Queensland Grazing Property Index
Swt	Shipped weight - the weight of beef aboard a shipment
TPP	Trans-Pacific Partnership
Turn-off	The number or rate of livestock sold to market
USD	US Dollars
USDA	United States Department of Agriculture
Yarding	Number of cattle offered for sale at a saleyard auction

References

ABARES, Australian Bureau of Agricultural and Resource Economics and Sciences, available at http://www.agriculture.gov.au/abares.

ABS, Australian Bureau of Statistics, available at: www.abs.gov.au.

ALFA, Australian Lot Feeders' Association, available at: http://www.feedlots.com.au/home.

BMI Research, available at: www.bmiresearch.com.

CSIRO, 2015, Livestock logistics, available at: https://www.csiro.au/en/Research/LWF/Areas/Landscape-management/Livestock-logistics.

DFAT, Department of Foreign Affairs and Trade, available at: http://dfat.gov.au/pages/default.aspx.

Ellicott, J 2018, Farm to palate, Bellata to Beijing, beef's digital future, The Land, available at: https://www.theland.com.au/story/5312211/borderless-bid-for-chinese-consumer-to-own-aussie-cow/.

Garfield, L. 2016, These robot butchers can carve 600 carcasses an hour – with one human in charge, Business Insider, 28 October 2016.

Goesch, T., Lawson, K., Green, R., Morey, K., Australia's beef supply chains – Infrastructure issues and implications, ABARES, October 2015.

Helibron, S.G. 2010, The Future of the Queensland Beef Industry and the Impact of Live Cattle Exports – Final Report prepared for Teys Bros, Swift Australia and Nippon Meat Packers Australia, , June 2010.

Joint Stone Barns Center for Food and Agriculture, Bonterra, and SLM, 2017 , Back to Grass: the market potential for U.S. Grassfed beef, available at: https://www.stonebarnscenter.org/wp-content/uploads/2017/10/Grassfed_Full_v2.pdf.

Joint WHO/FAO 2003, Diet, Nutrition and the Prevention of Chronic Dieases, Geneva.

Livestock biosecurity plan 101: Your guide to making it happen, Amy McCosker, ABC Rural, 14 July 2017.

MeatEng and Felix Domus, 2018, Analysis of beef cattle supply and evaluation of commercial viability of locations for processing facilities in Queensland, Prepared on behalf of The Department of Agriculture and Fisheries, Queensland.

MLA Industry Insights, Meat and Livestock Australia, available at: https://www.mla.com.au/prices-markets/overseas-markets/market-data-and-insights.

MLA, 2018, On farm robot now a reality, Meat and Livestock Australia, 5 April 2018, available at: https://www.mla.com.au/news-and-events/industry-news/on-farm-robot-now-a-reality/.

MLA, Meat and Livestock Australia, available at www.mla.com.au.

OECD-FAO, 2017, Agricultural Outlook 2016-2025, available at: http://www.fao.org/3/a-BO100e.pdf.

Oldfield, J. 2016, The Brazilian beef industry's slow climb could be a nightmare for Australia, The Weekly Times, 29 March 2016.

Reserve Bank of Australia, 2018, available at: https://www.rba.gov.au/statistics/historical-data.html#exchange-rates.

Strategic design & Development (Sd+D) 2008, Livestock and meat supply chain pilot study—stage one final report, report to the National Transport Commission, Sydney.

UN Comtrade Database, available at: https://comtrade.un.org/.

USDA, U.S. Department of Agriculture, available at: https://www.usda.gov/.

Van Extel, C. 2015, Counterfeit food threatens Australia's international reputation, ABC News 15 June 2015.

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‣ Strategic Drivers of the Queensland Beef Supply Chain

‣ The Existing Queensland Beef Supply Chain

‣ Future Outlook for Queensland Cattle and Beef Products

‣ Investment Analysis of the Queensland Beef Supply Chain

‣ Investor's Guide to the Queensland Beef Supply Chain

‣ Queensland Beef Producer Investment Guide

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