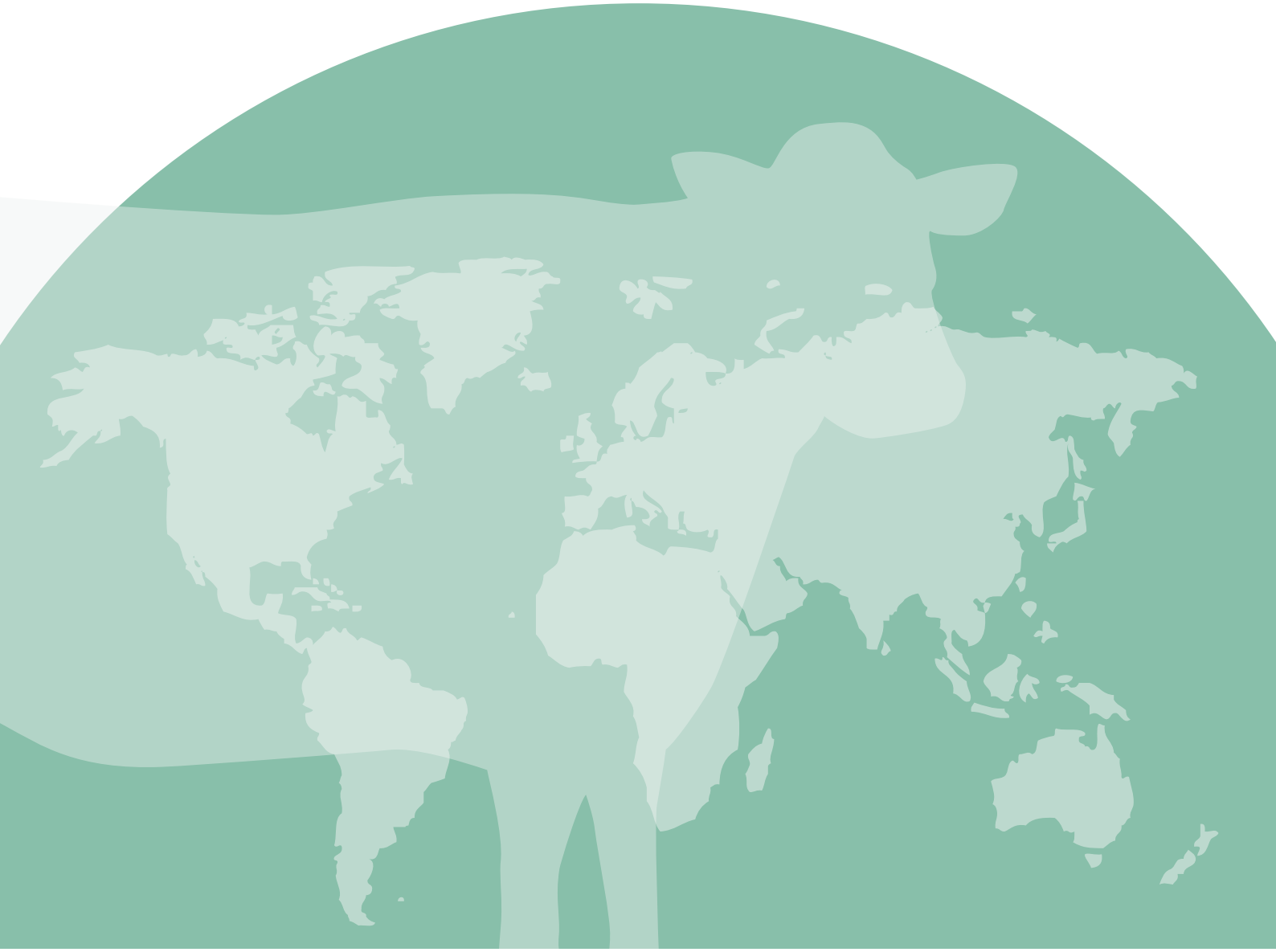
MEAT & LIVESTOCK AUSTRALIA MARKET INFORMATION

How are global and Australian beef producers performing?

Global *agri benchmark* network results 2019



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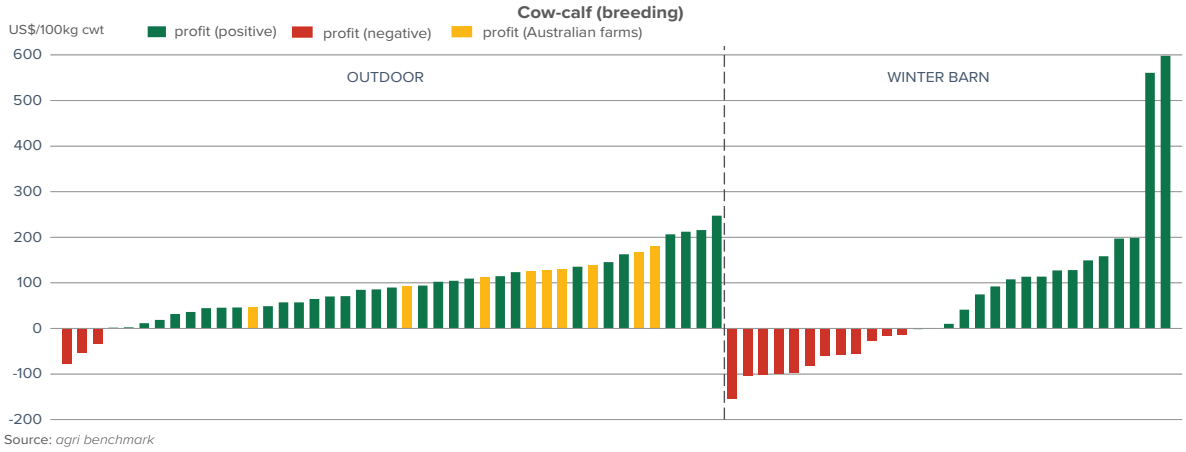
Global beef[1] cattle profitability

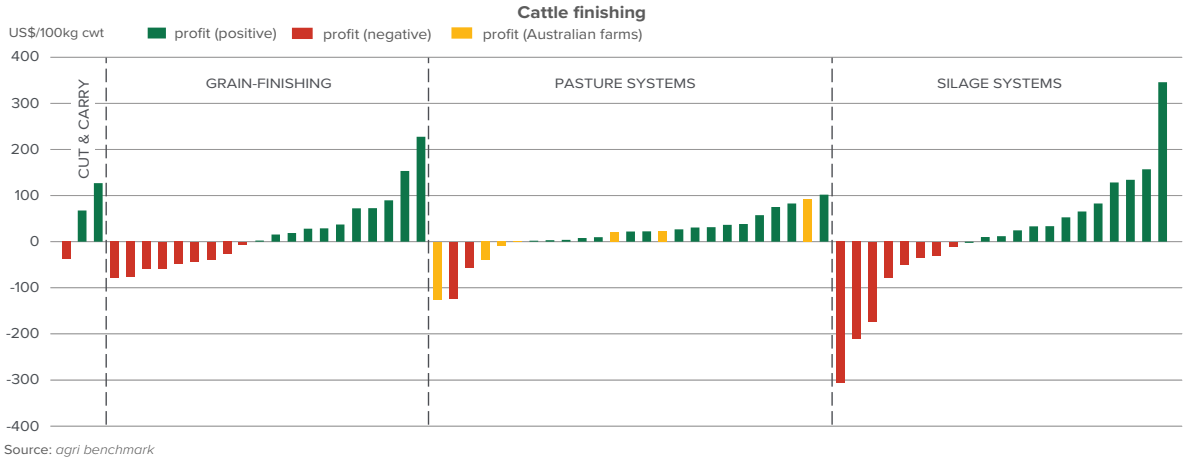
Globally, beef cattle farms were generally profitable in 2018 (medium-term – covering cash costs and depreciation) due to continuing high cattle prices and stable to lower costs. This was despite the impact of recent or ongoing drought on farm productivity and costs in many major producing countries.

Of the 139 agri benchmark 'typical' beef farms (that cover 75% of global beef production), 80% of cow-calf farms and 64% of cattle finishing farms were profitable in 2018 (see Figure 1). All systems were generally profitable – led by pasture-based cow calf and finishing systems. The most notable exceptions were some winter barn cow calf farms and silage finishing farms in Europe and a few drought-affected South African and Namibian farms.

Figure 1: Medium-term profits *agri benchmark* farms 2018



Source: *agri benchmark*



Source: *agri benchmark*

What is *agri benchmark*?

agri benchmark is a global, non-profit and non-political network of agricultural experts dedicated to lifting the productivity and viability of agricultural production across the globe through benchmarking farm performance. It is coordinated by the Thünen Institute – the German government rural research body – and has branches covering beef cattle, sheep, dairy, pigs, cash crops, horticulture, organic farming and fish. The attle network currently has 34 member countries – covering over 75% of global beef production.

If you are unfamiliar with *agri benchmark*, please read the appendix to this report (page 18).

[1] This report presents the *agri benchmark* network's perspectives on recent global beef developments, the economics and drivers facing producers around the world, farm profitability (globally and in network countries) and views on likely future developments and challenges. It then asks the question how competitive are Australian beef producers and what are the main areas where our productivity differs from other countries? The analysis and perspectives are as of mid-2019, though farm data is for the 2018 year.

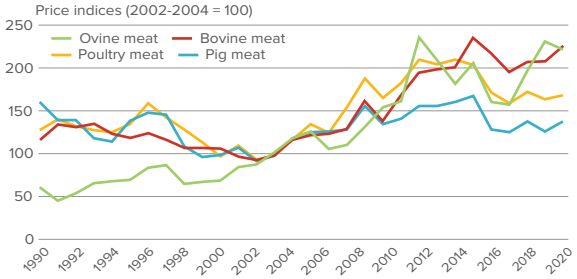
Cattle and beef prices

Global cattle and beef prices remained stable and high in 2018, as global supply growth struggled to keep up with the ongoing lift in demand, especially in major beef importing countries (led by China). Assisting these stable cattle and beef prices was the largely unchanged exchange rates against the USD in 2018 (but all still down against the USD since 2014). The main exception was further major falls in the currencies of Argentina, Brazil and Iran.

These stable and high prices are reflected in the FAO Beef Price Index which was unchanged in 2018 (see Figure 2) – only 12% below the extraordinary peak in 2014 and still more than double the level in the early 2000s, before the lift began. In contrast to beef and sheepmeat, global poultry and pork prices have fallen appreciably from their respective peaks in the past five years, on the back of increased supplies and slower demand (and import) growth.

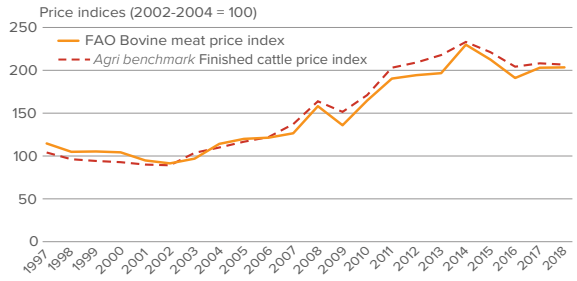
The new agri benchmark Global Cattle Price Index[2] was also high and stable in 2018, similar to the FAO Export Beef Price Index (see Figure 3). The agri benchmark Cattle Index represents average on-farm finished cattle prices collected by agri benchmark from all member countries, weighted using country production to yield a global price index.

Figure 2: FAO Global Meat Price Indicies
(based on USD prices)



Source: FAO Food Indices

Figure 3: *agri benchmark* Global Cattle Price Index and FAO Export Beef Price Indices

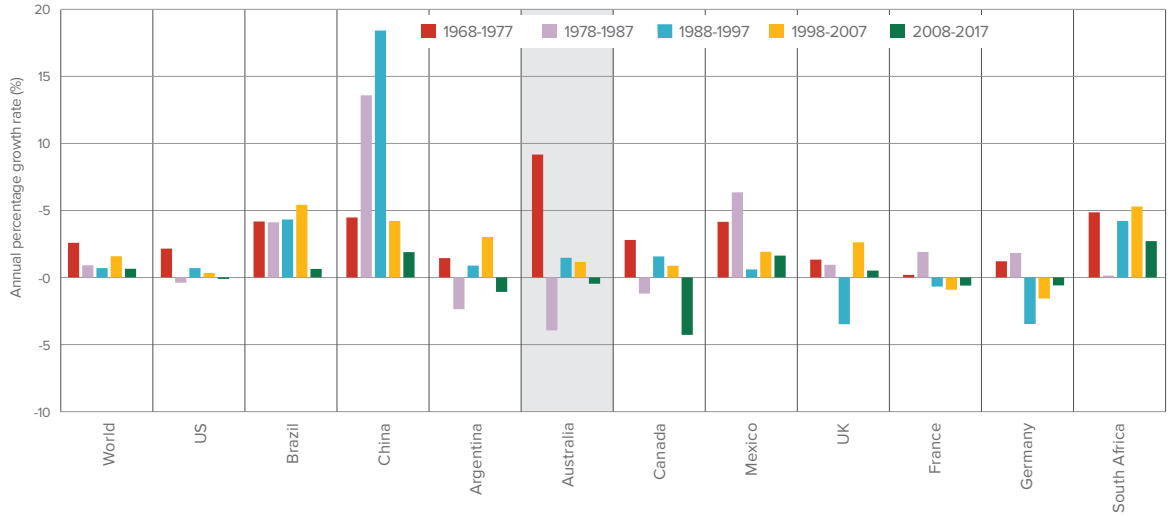


Source: *agri benchmark* Cattle Price Index, FAO Meat Price Indices

Global beef supply

Global beef supply growth has slowed in the last 10 years (see Figure 4), with notable falls in Europe, Canada, Argentina and Australia and no change in the US. Even growth in major emerging country producers and suppliers, such as China, Brazil, Mexico and Uruguay, was slower than in previous decades.

Figure 4 Beef production growth (last five decades)



Source: Calculations based on FAOStat 09.2019

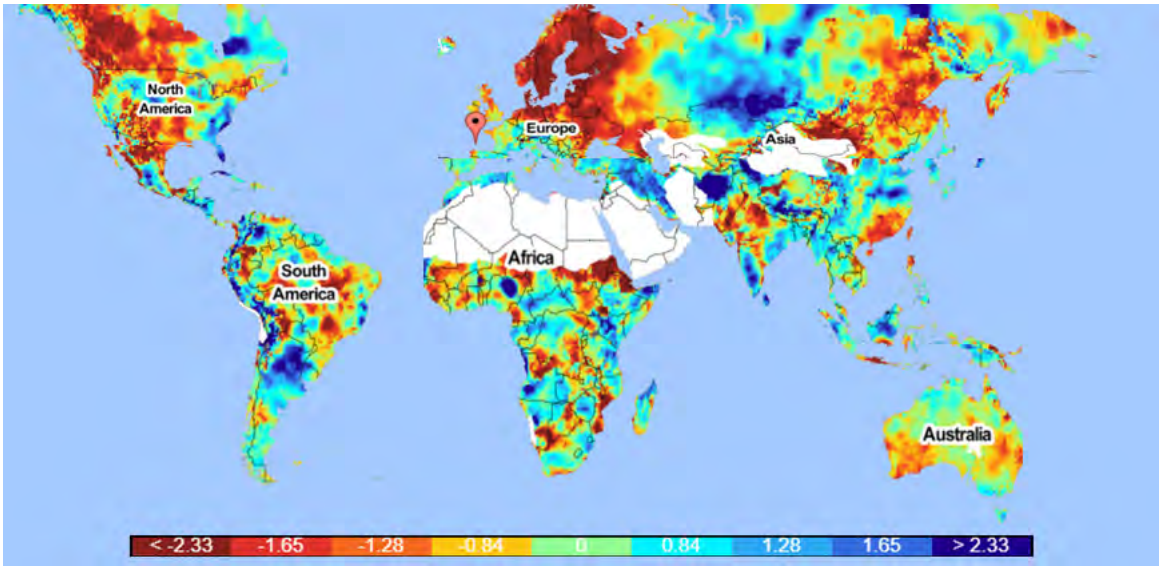
[2] *agri benchmark* has recently launched global price indices for finished cattle, lambs, and a combined lambs and sheep index for sheepmeat. These represent average on-farm livestock prices collected by *agri benchmark* from all member countries, weighted using country production to produce global price indices. A short index description is available on the agri benchmark website at http://www.agribenchmark.org/agri-benchmark/news-and-results.html

The explanation appears to lie principally in land, feed and environmental constraints, made worse by climate change. The rise in cattle and beef prices over the last 10-15 years has not yet had an appreciable impact on global beef supplies, as expansion in the US appears to have been offset by falls or slowing growth elsewhere.

Land constraints and increased environmental restrictions appear to be of increasing importance, both directly through beef herds and through the higher cost of grain (since the early 2000s). Recent severe droughts have played a role in slowing beef supply growth – especially in Australia, South America, Europe (Germany, Austria, France, Ireland and Spain), Africa (notably South Africa and Namibia), western Canada, Mexico and Iran (see Figure 5).

Common Agricultural Policy reforms are also still impacting production of both dairy products and beef in the EU, while FMD outbreaks are further affecting supply in South Africa and Namibia.

Figure 5: World drought map May 2018



Source: Government of Spain, July 2018 Saniago Begueri,a Borja Latorre, Fergus Reig, Serio M.Vicente-Serrano, Peter Carter Climate Change-FoodSecurity.org

Africa

Global beef demand and trade

Global demand for beef has lifted to a new level this decade following the rapid growth in consumption and imports in China and parts of South East Asia. Despite some beef supply response from the US and South America, beef production growth has been unable to exceed ongoing demand growth in recent years – hence, beef prices are holding close to the records reached in 2014. Global beef demand & trade

Global demand for beef has lifted to a new level this decade following the rapid growth in consumption and imports in China and parts of South East Asia. Despite some beef supply response from the US and South America, beef production growth has been unable to exceed ongoing demand growth in recent years – hence, beef prices are holding close to the records reached in 2014.

Changing beef demand regions

The OECD-FAO in the 2019 Agricultural Outlook 2019-2028[3], characterised the current era of changing beef demand as consisting of three distinct regional components:

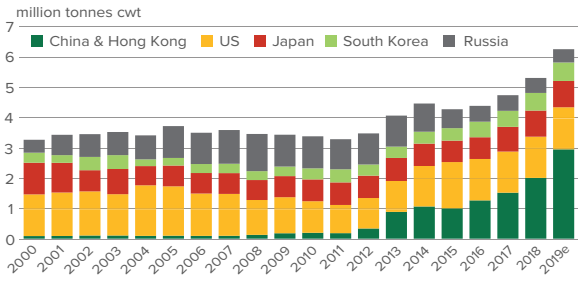
Emerging economies (led by China): with increased demand for beef driven by a combination of income growth, urbanisation and westernisation – leading to rising per person beef consumption (from a low base)

Advanced economies (led by the US and the EU): with beef 'saturation' and changing consumption patterns – in part, resulting from a steadily increasing health, environmental and sustainability awareness – leading to stagnant or declining per person beef consumption (from a high base)

Sub-Sahara Africa: with a slow increase in beef demand driven by population growth, but constrained by low incomes and a resulting on-going reliance on staple foods (cereals, roots & tubers, pulses) – leading to declining per person beef consumption (from a low base).

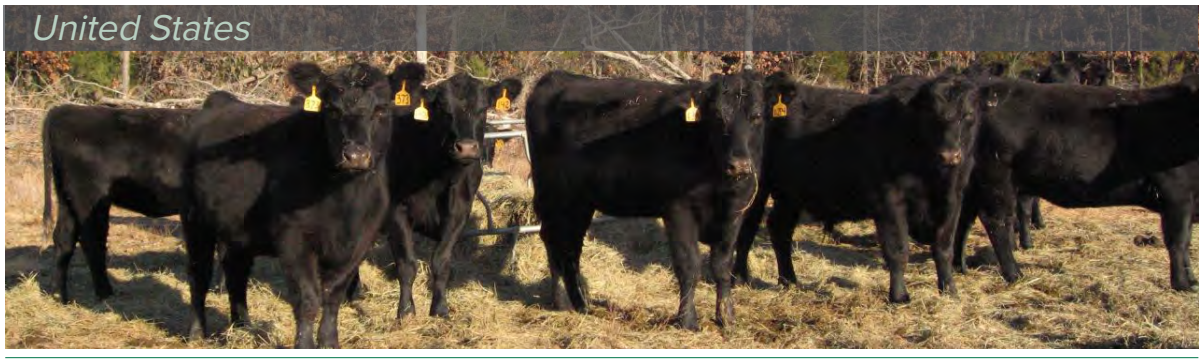
One reoccurring theme of the agri benchmark Conference 2019 was the impacts of China's demand for imported beef – from minimal trade just a decade ago to the world's largest beef importer (see Figure 6). This has caused a surge in beef trade and some diversion of beef products from traditional markets (especially South American beef from their domestic markets, the Middle East and Russia) to China by major exporting countries – especially lower-quality cuts such as manufacturing beef, brisket, shin/shank, blade and flap/knuckle. This is especially the case for Australia, New Zealand, Canada and the big three South American suppliers (Brazil, Argentina and Uruguay), which have all been granted 'official' import access to China. At the same time, China has reduced the large grey channel trades of India buffalo beef and US beef (mainly via Vietnam and Hong Kong).

Figure 6 Top five beef importing countries



Source: USDA

e: 2019 estimate as at January 2020



[3] OECD-FAO, Agricultural Outlook 2019-2028, July

The rapid emergence of China as the leading beef importer are a major source of both optimism and uncertainty as to global beef prospects, trade and prices. As China's economic growth slows there are some observers, notably the OECD-FAO, that suggest its beef import growth will slow in the coming decade and will be outstripped by growth in the South East Asian and MENA markets.

Market liberalisation has been a major driver expanding global beef trade over the past 30 years (commencing with South Korea and Japan in the late 1980s and the GATT Uruguay Round Multilateral Trade Agreement in April 1994). However, there is now a high risk that the world will slip back into farm subsidisation and protectionism, led by the USA and Europe. This has been evident since the failure of the Doha Round of World Trade Organisation (WTO) multilateral trade talks in 2008, which led to a plethora of bilateral agreements. The key components of this trade risk highlighted at the 2019 agri benchmark Conference were again the China-US trade (and currency) war and Brexit.

Another major demand risk highlighted at the 2019 Conference was the threat from plant-based protein substitutes to traditional beef products, particularly mince products such as hamburgers. A number of plant-based hamburgers have been successfully launched in the US market in 2019 led by Burger King and McDonalds (see Figure 7), with some now available in Australian supermarkets and restaurants.

Figure 7: Plant-based burgers

Plant Lettuce Tomato Burger (P.L.T.) McDonalds	*Impossible Whopper Burger King*	*Beyond Meat Coles*
		

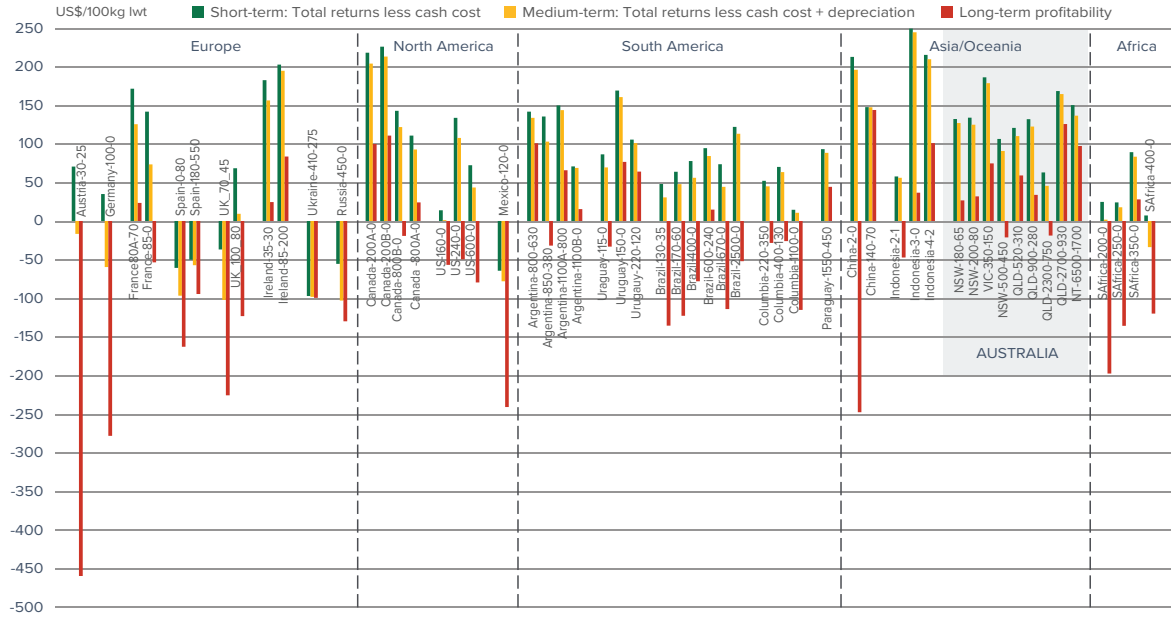
Source: https://www.engadget.com/2019/09/26/mcdonalds-beyond-meat-burgers-test/; https://impossiblefoods.com/ and https://www.beyondmeat.com/products/the-beyond-burger/

Financial performance of beef cow-calf enterprises

The year 2018 proved to be relatively successful for most of the 72 'typical' agri benchmark cow calf farms across 29 countries. Short-term profitability was achieved by 65 farms and across most countries, except a few in Spain (ES), Ukraine (UA), Russia (RU), Mexico (MX) and Namibia (NA), and one of the three farms in the United Kingdom (UK) – Figure 8[4].

Most farms achieved short-term profitability, except eight which meant they did not generate enough surplus income to cover their main enterprise and operational costs, including interest (for example Spain (ES) and Uruguay (UA)). A further nine of the remaining 65 farms did not achieve medium term profitability, so their surplus was not enough to cover depreciation, this means replacing machinery or infrastructure is difficult, but they could cover their main enterprise and operational costs, including interest (for example, Austrian (AT) farms were in this situation). Leaving 55 achieving enough surplus to enable them to replace infrastructure and machinery.

Figure 8: Profitability of cow-calf enterprise



Source: *agri benchmark*

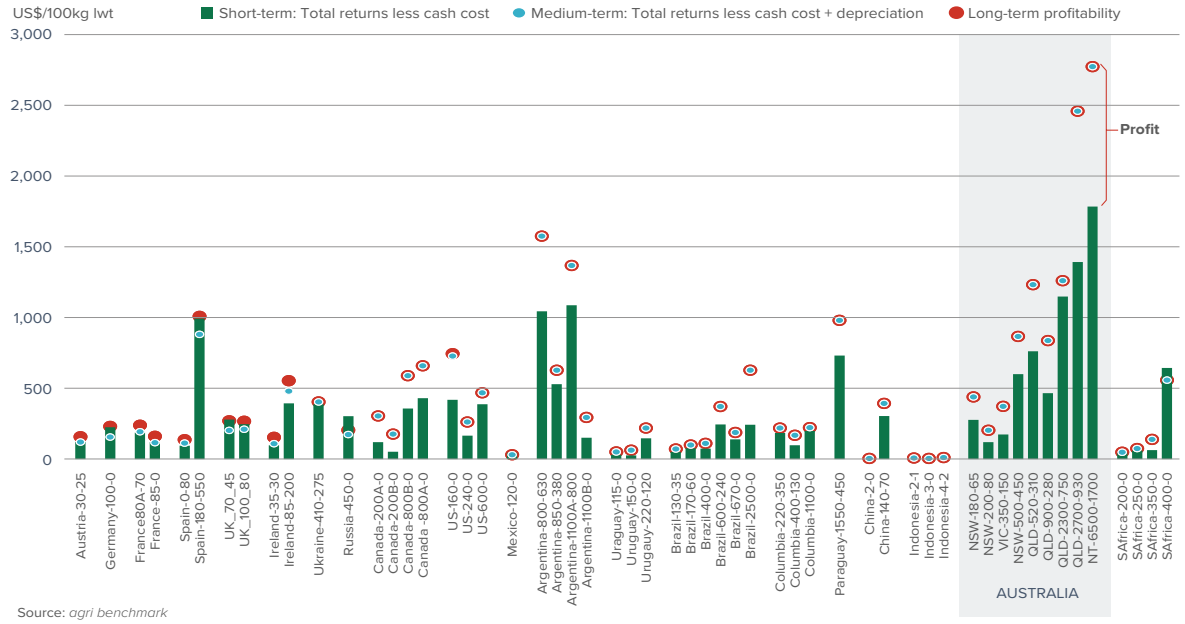
Generating cash surplus large enough to achieve long-term profitability (which includes covering opportunity cost of land, labour and capital) is often difficult to achieve, and in 2018 only 29 of the 72 farms achieved long-term profitability. However, seven of the nine Australian beef farms achieved this, showing the comparative strength of the Australian beef farming sector in 2018 relative to other farms around the globe, notably in Brazil and the US (key competitors which were not able to achieve long-term profitability).

Canada, Argentina, Uruguay, and Indonesia and the two Irish farms and one from Sweden achieved long-term profitability, although the European farms achieved this through government payments.

Figure 9 shows the difference between whole-farm returns and market returns indicating the difference between income received from cattle enterprise sales and total income, which includes returns from the sale of other commodities (e.g. crops, lambs, sheep or wool) and government decoupled and coupled payments. If the market returns are above the bar, this means the farms achieved a surplus and therefore medium-term profitability (opportunity costs are not included in this graph).

[4] This is a shorter version of the data set, displaying 57 farms. Switzerland (CH), Sweden (SE), Poland (PL), Czech (CZ), Kazakhstan (KZ), Namibia (NA) and Botswana (BW) are not included as they do not directly compare with any Australian farms.

Figure 9: Whole farm enterprise costs and returns[5]

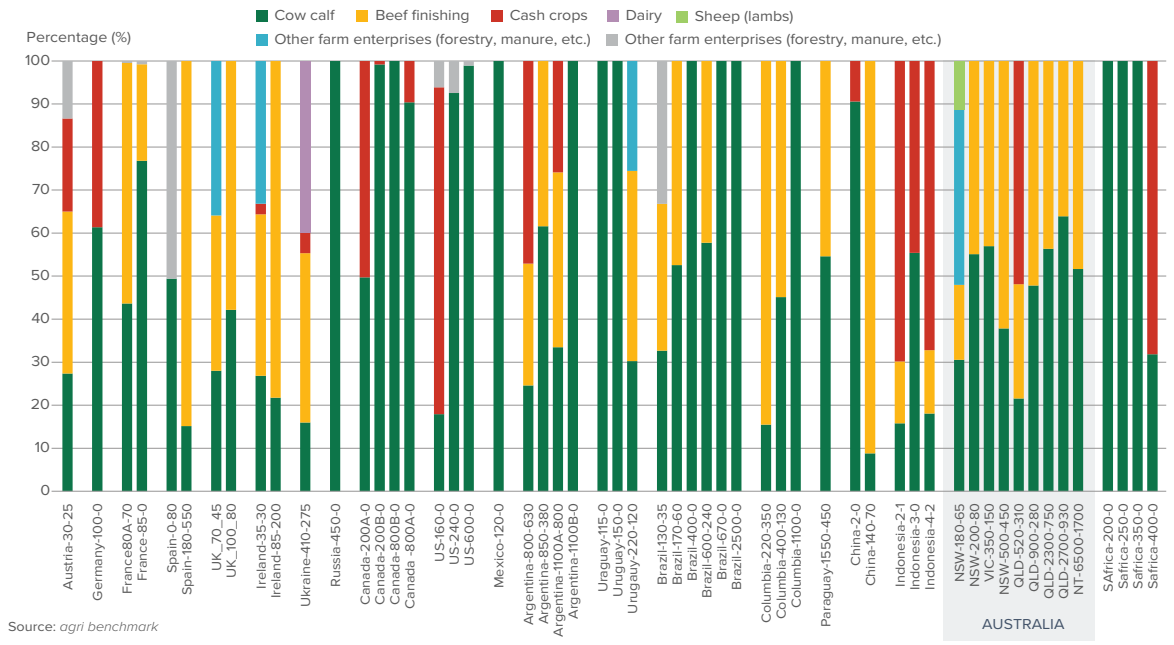


Source: *agri benchmark*

Global beef farms are reliant on income from beef production, either from the cow calf enterprise, beef finishing enterprise or a combination of the two (as are all the typical Australian farms). While many cow-calf enterprises have alternative enterprises within their business, they mostly rely on their income from beef. The exception to this is one dairy farm and 8 cash-crop farms. Of the 72 farms, 39 have a beef finishing enterprise, 20 farms have cash crops, 3 have a dairy enterprise, 5 have sheep and 8 have alternative enterprises like manure or forestry. There are 20 farms which rely solely on the cow calf enterprise for income – Figure 10.

Australian beef farms are specialised businesses, concentrating on beef production with a finishing system to compliment the cow calf enterprise. Like most cow calf enterprises around the world, all nine farms are pasture-based production systems. The Australian farms are classed as out-door, which is defined as 'no barns, sometimes cover or shed, grazing plus hay (plus silage) outside, sometimes very low stocking rates'. For example, NT-6500-1700 located in the Northern Territory has very low stocking rates.

Figure 10: Income structure including government payments (%)

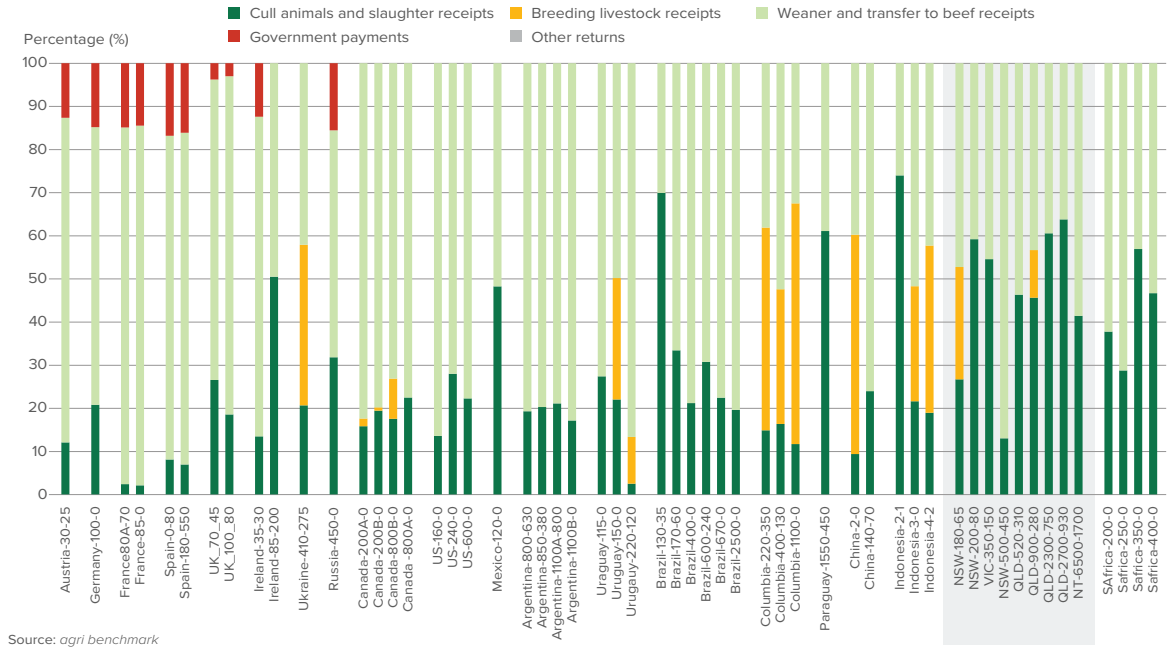


Source: *agri benchmark*

[5] Figure 9 displays 55 farms. Switzerland (CH), Sweden (SE), Poland (PL), Czech (CZ), Kazakhstan (KZ), Namibia (NA) and Botswana (BW) are not included in this graph as they do not directly compare with Australian farms. DE-1400_800 and UA_295_5600 are also omitted as they are a high 'outliers' making it difficult to discern results for the other farms.

Figure 11 demonstrates the reliance of the cow calf enterprise on weaner sales. Cull animal receipts are an important secondary income stream for countries selling breeding stock and government payments also contribute to income in Europe.

Figure 11: Percentage composition of the total returns from the cow calf enterprise

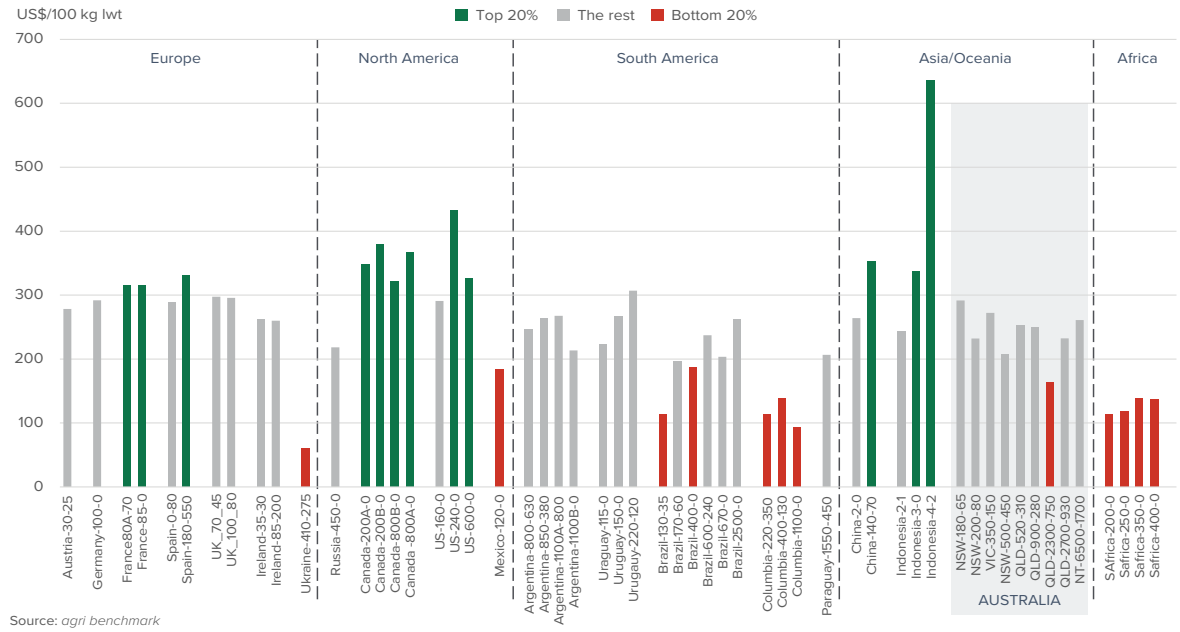


Source: *agri benchmark*

Weaner and cull cow prices

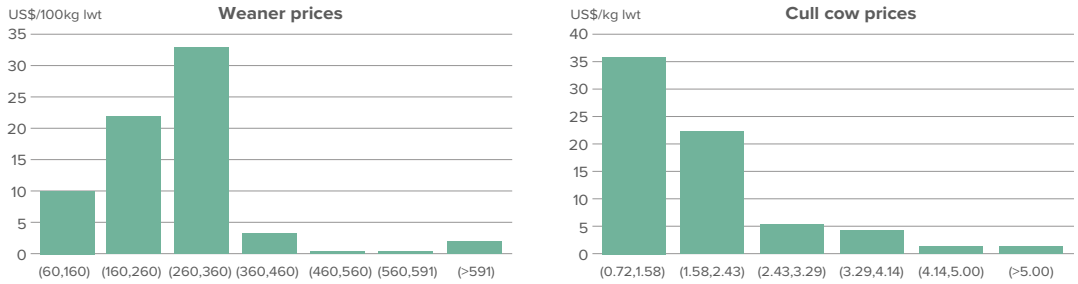
The average price for weaners, at US262/100kg live weight (lwt), was also the median price. Prices ranged from US$60/100kg lwt to US$792/100kg lwt. Weaner prices for Australian farms were in the 50th percentile, except QLD-2300_750 which was in the bottom 20% (Figure 12), while Vic-350_150 and NSW-180_65 were in the 75th percentile. Figure 12 illustrates the countries which received prices in the top 20%, typically in North America, except Mexico, and parts of Europe, and the bottom 20% of prices, mostly in parts of South America and South Africa.

Figure 12: Weaner prices



Source: *agri benchmark*

Figure 13: Range in weaner prices[6]



Source: *agri benchmark*

The average cull cow price was US$1.84/kg lwt and the median price was US$1.50/kg lwt, ranging from US$9.11 on one farm in Switzerland to US$0.76 in Columbia, but range in price within countries and farms was not large (Figure 13). Australian farms averaged US$1.7/kg lwt, ranging from US$1.4 to US$2.0, and were generally close to the median. NSW-200_80, QLD-520_310 and QLD-2700_930 all received cull cow prices in the 75th percentile and more than US$1.9/kg lwt.

How efficient are Australian farms at cow-calf production?

The key physical performance indicators for the cow calf enterprise are stocking rates, weaning rates and total liveweight produced per cow. On the financial side, weaner prices and cost of production have a key influence on enterprise profitability.

Stocking rate

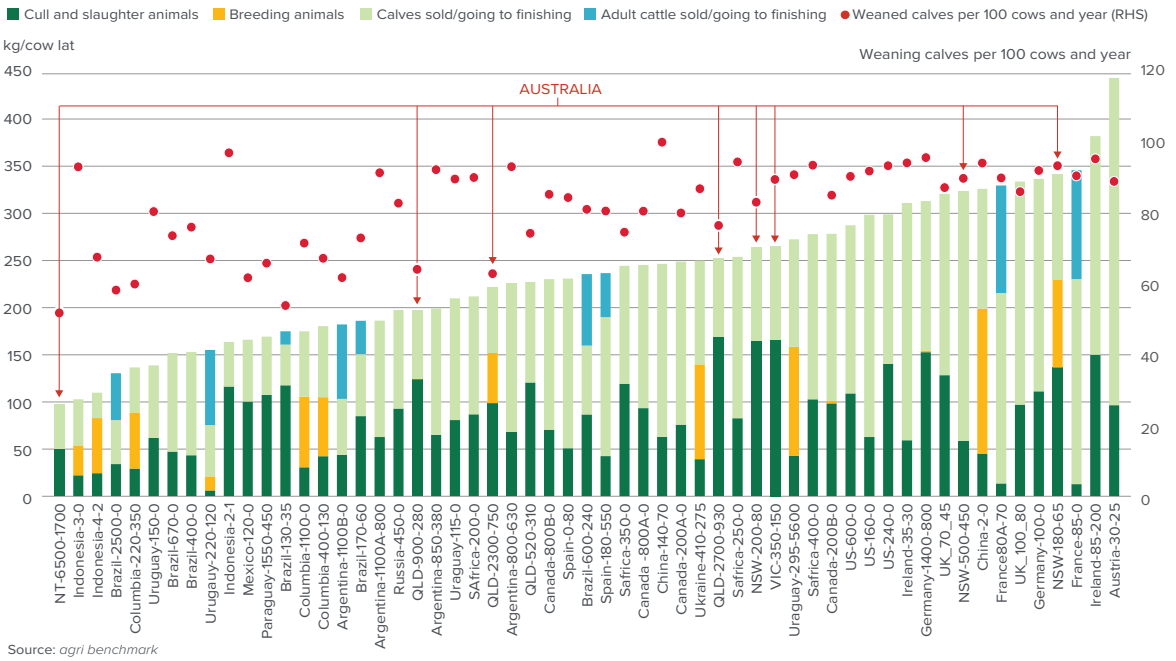
Northern Australian cow-calf systems have relatively low stocking rates, on a par with similar rangelands in Montana and Kansas (US), Alberta (Canada), and semi-Kalahari bosveld (South Africa). However, southern Australia's higher rainfall systems maintain high stocking rates and land productivity, similar to European and the more intensive South American systems.

Weaning rates and total live weight produced per cow

The average weaning rates (calving percentage minus calf mortality) per 100 cows is 81%. Most countries achieve weaning rates above 79%, but there are a few with very low reproductive and weaning rates – Figure 14. For example, AU-6500-1700 located in the rangelands of the Northern Territory has the lowest weaning rate. Other systems, with similar rates and extensive cattle production, are found in South America (Brazil, Columbia, Paraguay, Uruguay) and Africa.

[6] Weaners going to finishing

Figure 14: Total live weight sold per cow (kg) and weaning % for calves



Source: *agri benchmark*

There is a moderately strong correlation between total livestock produced per cow and weaning rates. Figure 14 shows that the countries producing more than 250kg lwt per cow are more likely to have a weaning rate above 80%. This demonstrates the importance of weaning rate to the cow-calf enterprise productivity, and provides an area of management where countries or regions with low weaning rates – for example, the region where AU_6500_1700 – could improve productivity and profitability. However, this remains challenging for extensive systems with poor pasture bases and harsh climatic conditions.

Nutrition, genetic capacity, reproductive rates, mature size of breed, generation interval, growth rates and turn-off weights drive weaning percentage rates and total live weight produced per cow.

The Australian farms with the lower total liveweight sold and weaning rates (Figure 14) are located in rangeland type country and run Bos Indicus breeds or Bos Indicus/British Breed cross cattle, such as the Droughtmaster, and are generally performing as well or better than other countries, such as Brazil, Columbia and Africa, using similar breeds.

Total cost of cow-calf production

Australia's competitive advantage in the cow calf production sector in 2018 was its low cost of production. The Australian farms cost of production (Figure 15) was very similar to many of the traditionally low cost of production countries in South America, like Argentina (AR), Brazil (BR) and Columbia (CO). Interestingly, the opportunity cost for land is higher in Brazil than Australia, averaging 84 and 46 US$/100kg lwt respectively and contributing to Australian farms achieving long-term profitability.

Australia farms' cost of production was lower than the US for all costs and generally lower than the Canadian (CA) farms – Table 1 and Figure 15.[7]

Table 1: Average (range) costs of selected farms compared to all cow-calf farms US$/100kg lwt

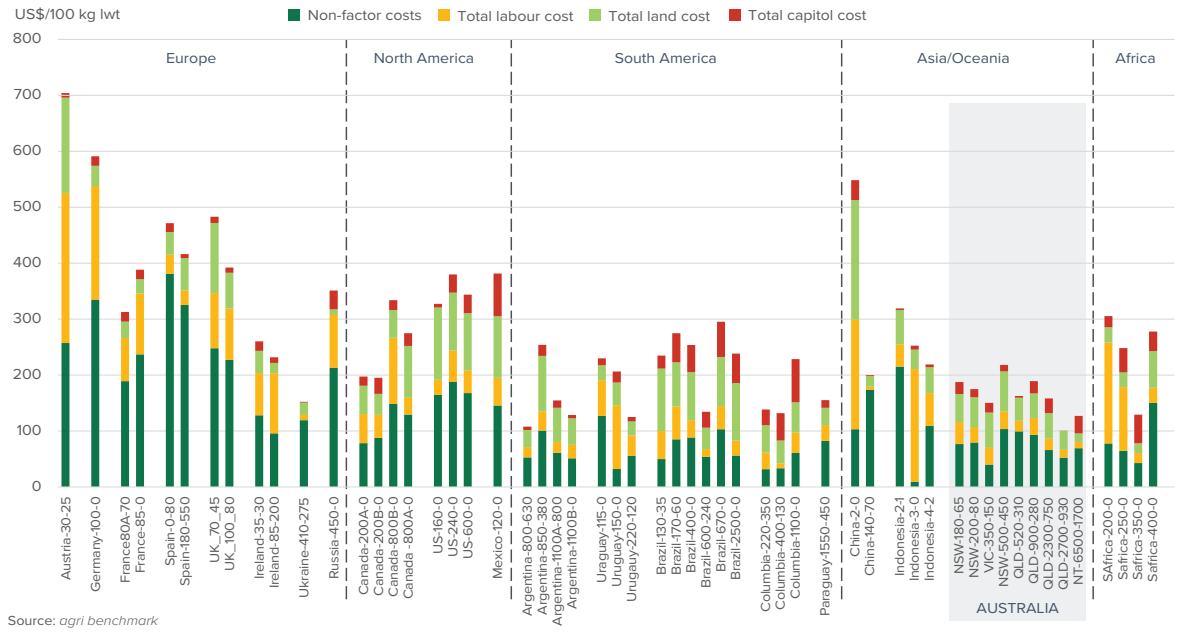
	All farms	Australia	Brazil	Argentina	Canada	US
Total cost of cow-calf enterprise	**334 (81 -2,269)**	**162 (100-217)**	**237 (134-294)**	**160 (107-253)**	**249 (194-333)**	**349 (326-379)**
Non-factor costs	164 (9 – 1176)	75 (39-103)	72 (49-102)	66 (50-100)	110 (77-147)	172 (163-187)
Total labour costs	82 (3-809)	25 (11-39)	37 (14-59)	24 (18-35)	60 (30-118)	41 (56-28)
Total land costs	59 (0-214)	46 (16-71)	84 (38-111)	59 (30-99)	57 (38-93)	111 (102-129)
Total capital costs	29 (0-230)	16 (0-31)	45 (23-63)	11 (6-20)	21 (16-29)	24 (7-33)

Source: *agri benchmark*

[7] A shortened data set showing selected farms from all countries.

Australians labour costs (US$/100kg lwt) were also generally lower than, or similar to, the selected farms in Table 1. This was despite having the highest labour cost per hour, except Sweden[8], at an average of US$21/hour for paid labour and a US$23/hour opportunity cost for family labour, the same as 2017. However, Australia's labour productivity or labour cost per 100kg lwt beef produced, is better than, or as good as, many countries, including in Africa where labour costs $/hour are very low at US$1-3/hour.

Figure 15: Total cost of the cow-calf enterprise



Source: *agri benchmark*

In summary, Australian beef cow-calf systems

The cow-calf component of Australian beef cattle farms are internationally competitive compared to their main export competitors from North and South America. Australian cow-calf enterprises have relatively low cost of production, economies of scale, high labour productivity (kg LW produced per hour of labour input) and the ability to achieve long-term profitability, assisted by lower opportunity costs.

There are opportunities for Australian farms to improve their productivity, especially in the more extensive systems, by improving weaning percentages. However, this is difficult in systems with poor pasture production and challenging climatic conditions, and unlikely to occur in the short-term future as dry conditions persist in many parts of Australia creating difficulties for pasture growth and animal management.

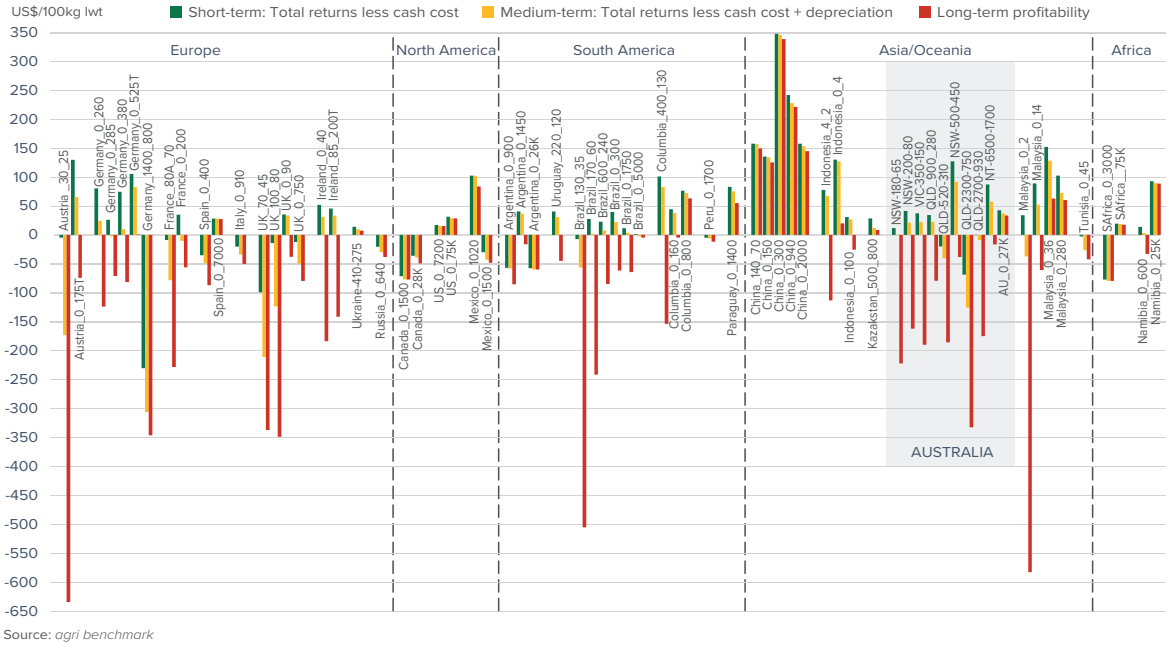
Australia

[8] Sweden labour cost per hour is US$25.

Financial performance of beef cattle finishing enterprises

There was a deterioration in financial performance for beef finishing enterprises in 2018 compared to 2017 – only 64% of farms achieved short-term (cash) profits, when in 2017 nearly all achieved this, and only 58% achieved medium-term profits (covering cash costs and depreciation), 12% less than 2017. However, more farms achieved long-term profitability (covering the opportunity cost of land and family labour) than in 2017, 26% compared to less than 20%.

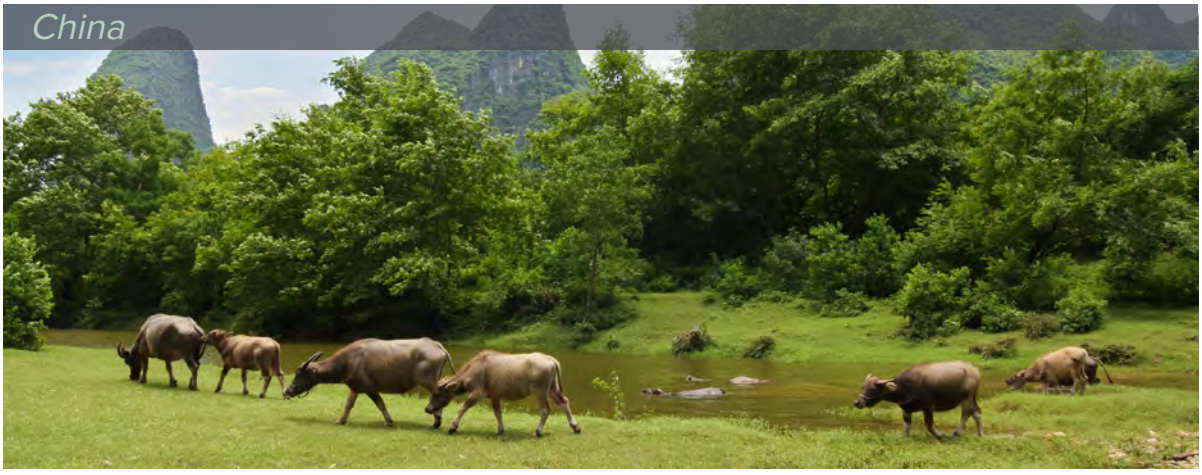
Figure 16: Short- medium- and long-term profitability for beef finishing enterprises[9]



Source: *agri benchmark*

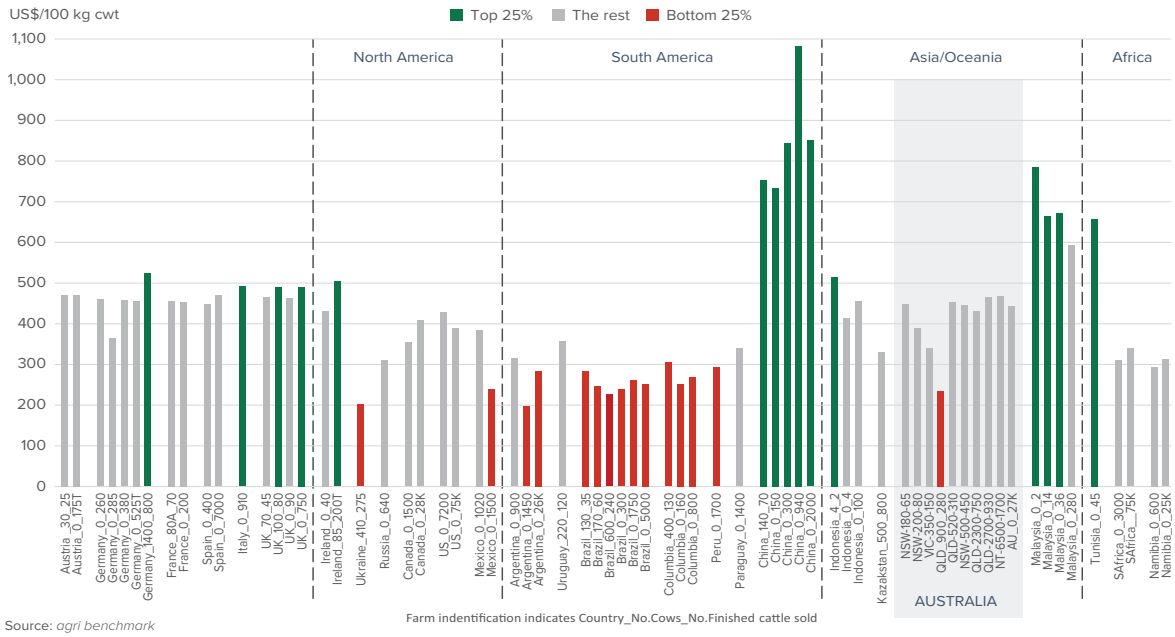
Outstanding financial performance by the Chinese beef finishing farms is evident, all achieving long-term profitability, unlike most other countries. Only one Australian farm achieved this, which was a specialised feedlot enterprise. Long-term profitability was achieved by the Ukraine in Europe, one US farm and one Mexican farm in North America, and, from South America, one farm each in Argentina, Uruguay and Paraguay and two in Columbia.

The finishing systems in China are either silage or grain-based, and their high level of profitability was driven by high beef prices (US$ per 100kg carcase weight), as shown in Figure 17. This was also assisted with reasonable costs, despite two of the farms in China being in the top quartile for cost of production and the other two farms near the average, which was US$506 per 100kg carcass weight – Figure 18.



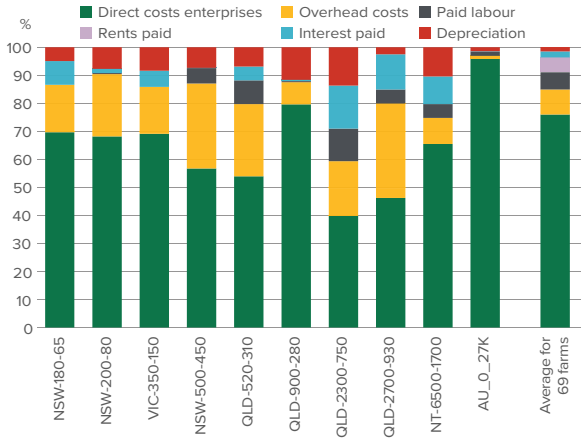
[9] This is a shorter version of the data, 69 farms instead of 99

Figure 17: Beef prices for 2018



Source: *agri benchmark*

Figure 18: Cost of production (%) for Australian farms compared to the average



Source: *agri benchmark*

Australia's cost of production (Table 2) ranges from US$761/100kg cwt sold to US$311/100kg cwt sold and the Australian average (US$544/100kg cwt sold) is close to the total average for all the farms (US$506/100kg cwt sold) – Table 2. Australia's average cost of production is higher than the cost of production in Brazil and Canada, but some of the Australian typical farms have a lower cost of production.

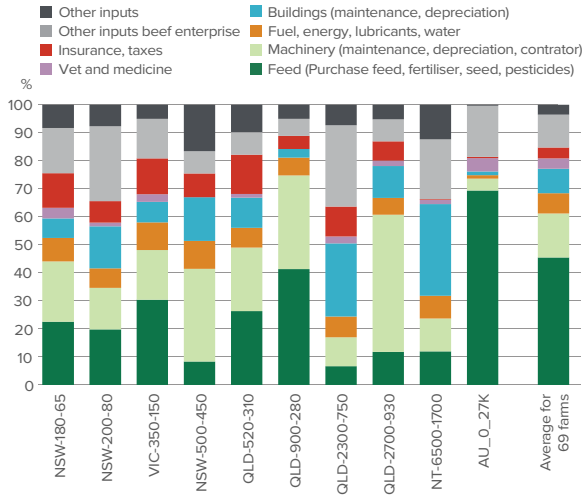
Although Brazil has lower cash costs, its opportunity cost of land is higher than in Australia, which increases the cost of production. US farms have a lower cost of production compared to the average and to most Australian farms, the Canadian farms and Brazil due to not having any opportunity costs for labour, land or capital.

Table 2: Cost of production (US$/100kg cwt sold) for Australia's farms compared to the average for all farms and the average for farms in Brazil and Canada.

	NSW-180-65	NSW-200-80	VIC-350-150	QLD_900_280	QLD-520-310	NSW-500-450	QLD-2300-750	QLD-2700-930	NT-6500-1700	AU_0_27K	Average for 69 farms	US	Brazil	Canada
Total cost of beef enterprise	**665**	**544**	**524**	**311**	**631**	**478**	**761**	**645**	**478**	**407**	**506**	**381**	**410**	**439**
Cash cost	431	341	297	197	466	312	497	471	375	398	393	379	234	429
Depreciation	12	20	15	12	20	35	57	8	30	6	24	2	20	4
Opportunity cost	221	183	211	102	145	130	207	166	74	4	91	0	156	5
Opportunity costs	221	183	211	102	145	130	207	166	74	4	91	0	156	5
Labour	98	62	64	28	17	72	22	16	11	2	62	0	41	0
Land	111	99	130	53	126	40	138	149	31	0	48	0	102	1
Capital	13	21	17	20	2	17	47	0	31	2	14	0	27	5

Source: *agri benchmark*

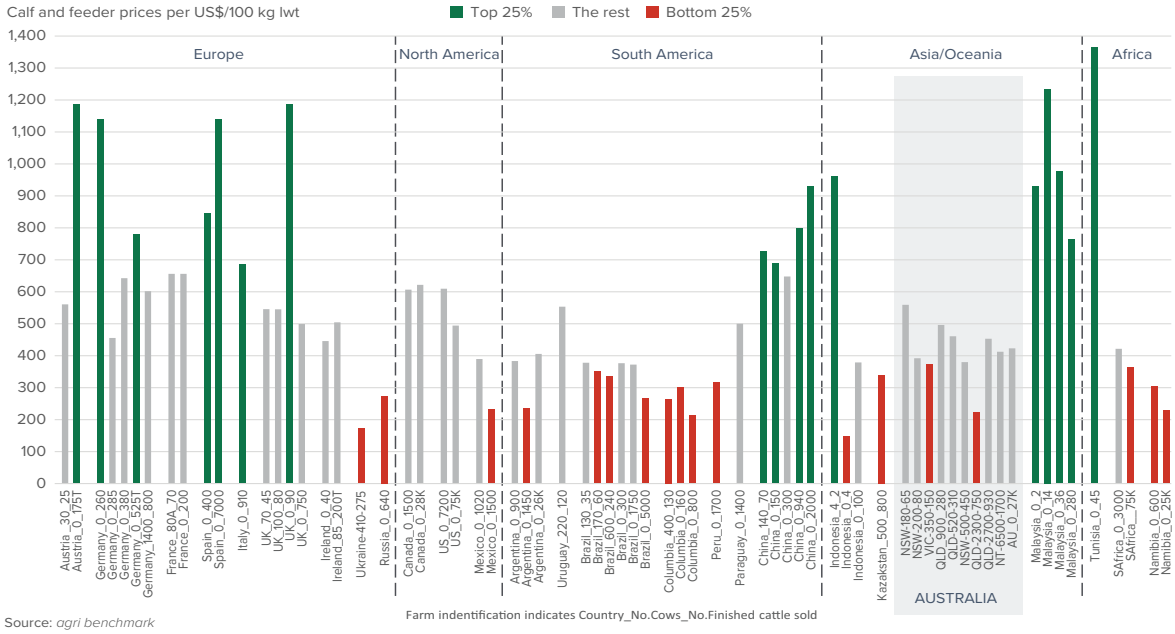
Figure 19: Percentage composition of non-factor costs (excluding animal purchases) for Australian farms compared to average for 69 farms



Source: *agri benchmark*

Direct costs for the enterprise make up the highest proportion of costs and are derived from the expenses outlined in Figure 19. There is variation between farms around their allocation of expenditure which is a product of their location and farming system. Supplementary feed to manage feed gaps is the highest expense for most farms, although this cost is very low for the Queensland and Northern Territory rangeland farms.

Figure 20: Total cost of production (including opportunity costs for land and labour)



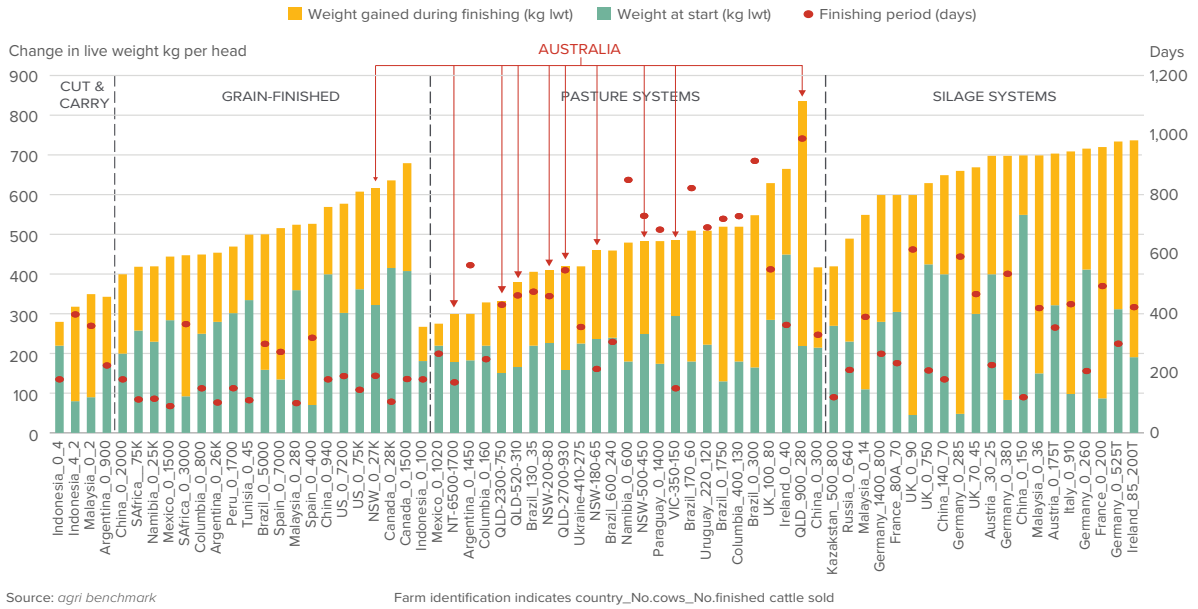
Source: *agri benchmark*

Farm indentification indicates Country_No.Cows_No.Finished cattle sold

How efficient are Australian farms at beef cattle finishing?

European systems are predominantly silage or grain based with long finishing periods and high final weights (> 600kg lwt) – Figure 21. QLD_900_280 had the highest finishing weight for the pasture system in comparison to the other farms and to the other finishing systems. These weights were also higher than 2017 for the same farm with a longer finishing period at 990 days, so they were mature steers (Figure 19). The finishing weights for the other Australian farms on pasture were < 500kg lwt. The Northern Territory farm was the lowest, at 300kg lwt, a response to the weights required to meet the live-export feeder demand from Indonesia and a reflection on the rangeland environment (Figure 21).

Figure 21: Change in live weight during finishing



Source: *agri benchmark* Farm identification indicates country_No.cows_No.finished cattle sold

Entry weights for Australian farms were generally >200kg lwt, as was for 51 other farms. Some of the European silage systems have entry weights below 100kg lwt and finish to >600kg lwt, generally adding the most weight of the four production systems, on average 374kg lwt – Figure 20. South American entry weights are generally between 150-200kg lwt and finish to <500kg lwt.

Grain finishing systems generally add more weight, averaging 256kg lwt weight gain, than the pasture systems. Grain-based systems typically finish cattle within a shorter timeframe (averaging 179 days) compared with pasture (507 days) and silage (340 days) – Figure 21.

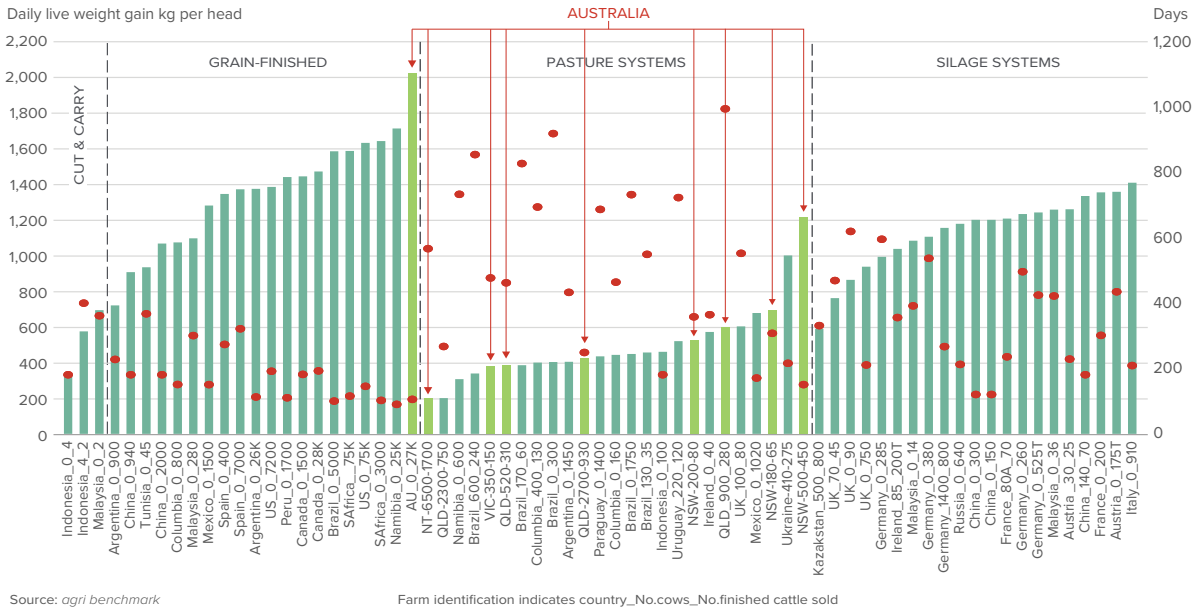
Spain

The type of finishing system and the relationship between daily weight gains, changes in live weight and finishing period is clearly demonstrated by examining the daily live weight gain (grams/day) in Figure 22.

The daily live weight gain (gram/day) is higher in a grain finishing system compared to pasture and silage finishing system, as expected. However, when comparing cost of production by system (Figure 23) the range is similar, even though it seems counterintuitive that the average cost of production for grain finishing is lower than pasture or silage finishing systems. The average cost of production for grain finishing is US$426/100kg cwt sold, compared to US$463/100kg cwt sold for finishing on pasture and US$595/100kg cwt sold for finishing on silage. Grass is often associated with being a lower cost of production, yet the lower daily live weight gain (grams per day) and increased number of days required to finish cattle increased the costs compared to grain-finished animals – Figure 22. The result is sensitive to the price for grain, as demonstrated by the lower price for grain in 2018 which influenced this result.

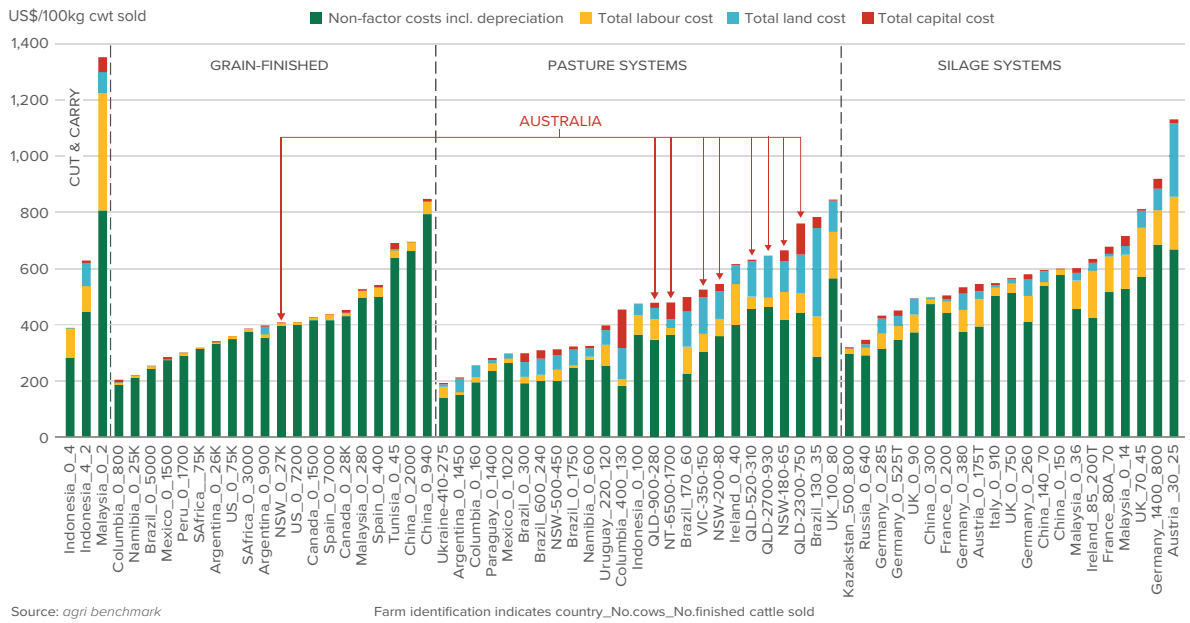
The Australian grain-finishing farm achieves the highest live weight gain (grams/day) compared to the other grain finishing farms. The other Australian farms (pasture finishing system) have daily live weight gains (grams/day) ranging from the highest in NSW to the lowest in the Northern Territory rangelands system.

Figure 22: Daily live weight gain for different finishing systems



Source: *agri benchmark* Farm identification indicates country_No.cows_No.finished cattle sold

Figure 23: Comparing cost of production for finishing systems



Source: *agri benchmark* Farm identification indicates country_No.cows_No.finished cattle sold

In summary, Australian beef finishing enterprises

The only Australian farm to achieve long-term profitability in cattle finishing in 2018 was the grain finishing farm, AU_0_27K. All other Australian farms could not recover the opportunity cost of land and labour, so long-term profitability was not achieved. Most other global cattle finishing farms, except China and a few farms in South America, also did not achieve long-term profitability.

The short-term and medium-term profitability for the Australian farms was mixed – the northern beef systems in Queensland did not achieve short- or medium-term profitability in 2018 due to drought conditions, while the southern beef systems and the Northern Territory farm achieved medium-term profitability.

Most Australian farms received average beef prices and, although not as high as China and Europe, they were above those received by most farms in North America and South America.

The Australian beef finishing enterprises had a wide range in cost of production and were generally above the global average for direct enterprise costs and land and labour opportunity costs. They also had lower levels of profitability than the cow/calf component within the whole farm beef production business, which has been the case for the last seven years.

Argentina

Appendix

What is *agri benchmark*?

agri benchmark is a global, non-profit and non-political network of agricultural economists, advisors, producers and specialists in key sectors of agricultural value chains. It is operated as an international network of research partners coordinated by the Thunen Institute – the German government rural research body.

agri benchmark has branches covering beef cattle, sheep, dairy, pigs, cash crops, horticulture, organic farming and fish. The cattle network has over 34 member countries, covering 75% of world beef production and has been producing the results of comparative analysis over the last 17 years.

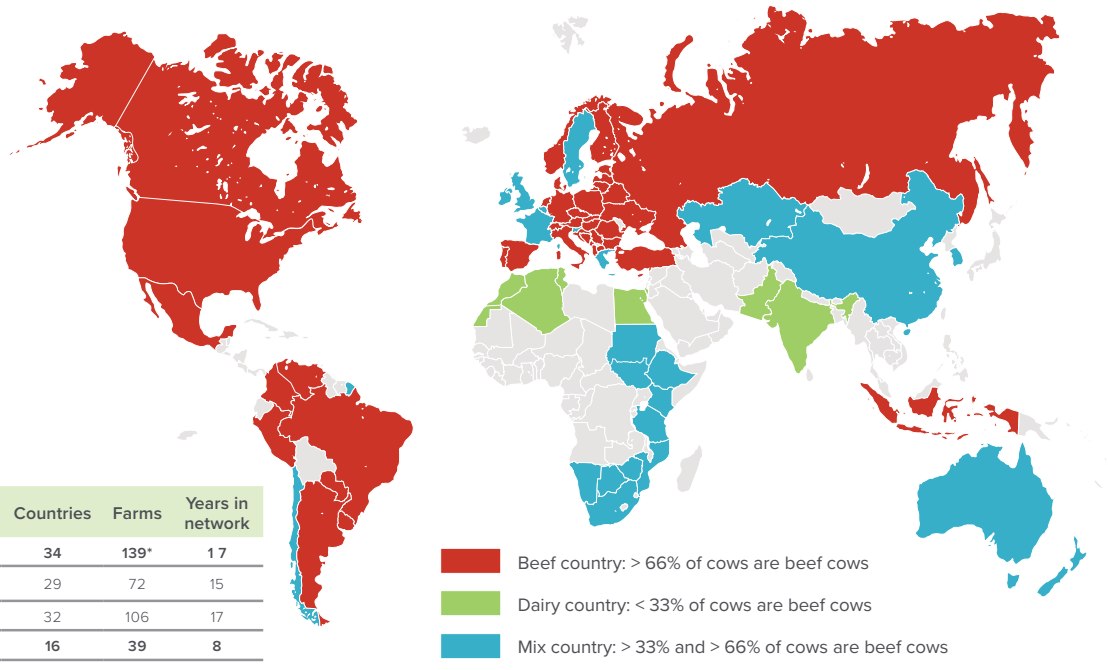
The core competence of the network is in analysing production systems, their economics, drivers and perspectives.

agri benchmark aims to assist:

- producers to better align future production through analysis of comparative performance and positioning;
- non-profit organisations (NGOs, international organisations) to monitor global agricultural challenges;
- public and industry institutions to better plan research, farm policy and programs and make their case
- agri-businesses to operate successfully through in-depth understanding of markets and customers.

The *agri benchmark* cattle network covers both breeding and finishing enterprises (cow-calf and cattle finishing), which are typically conducted on the same farm in Australia. It is also unique in being able to separately measure the performance of the breeding and finishing operations even on joint breeding/finishing farms. Furthermore, it measures cattle enterprise performance separately from (and together with) other outputs where the farm business is diversified (in southern Australia typically with cropping and/or sheep).

Figure A1: Countries in the *agri benchmark* beef and sheep network



2019	Countries	Farms	Years in network
Beef	**34**	**139***	**1 7**
Cow-calf	29	72	15
Finishing	32	106	17
Sheep	**16**	**39**	**8**

*39 of these farms ave both cow-calf and finishing

Source: PSD/FAS/USDA Online, Eurostat National stistics, own estimations

Beef cattle operations are divided into cow-calf enterprises and cattle finishing enterprise, even when conducted within the same farm operation, as typically occurs in Australia. Cow-calf enterprises can be further divided into 'outdoor' and 'winter barn' systems. Finishing enterprises can be subdivided into 'pasture', 'grain finishing', 'silage' and 'cut & carry' systems.

The farm-level results in this report are drawn from the collection of 'typical farm' data in each country, and subsequent analysis and research efforts of all member countries culminating in the 17th Annual *agri benchmark* Conference in Windhoek, Namibia, 6-12 June 2019.

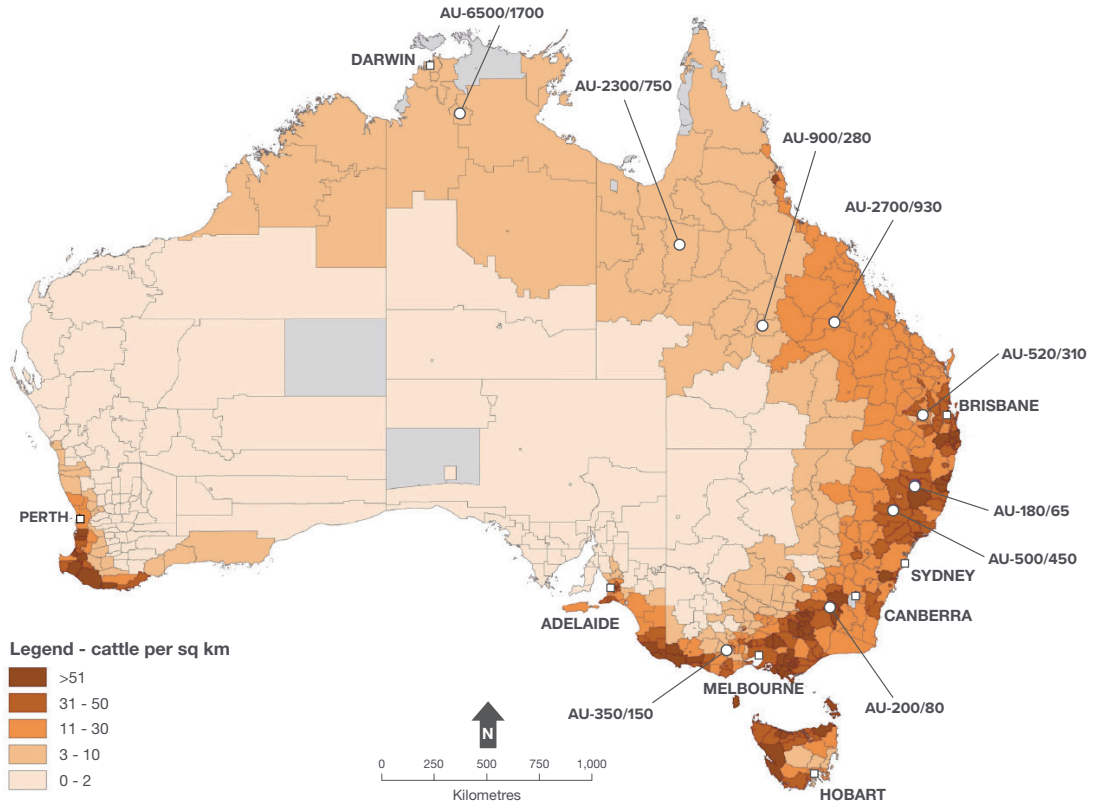
A 'typical farm[10]' can be based on data for an actual farm judged to be typical of a main production system in a key region[11], or 'engineered' by local producers and experts to be typical (using annual data drawn from farms in the key production regions).

In Australia, data was collected for nine typical beef farms in Queensland, the Northern Territory, NSW and Victoria (see Figure A2 and Table A1).

Table A1: Australian *agri benchmark* typical beef cattle farms

Held/Sold (Cows/Steers)	**Farm make-up**
AU 180/65	(180 Cows held/65 steers sold) – northern tablelands NSW; Angus + sheep + wool; pasture feed base
AU 200/80	southern tablelands NSW; British breed; pasture feed base
AU 350/150	western districts Vic.; Angus; pasture, hay, oaten grain feed based
AU 900/280	central Qld; Bos Indicus; pasture, mineral supplements feed base
AU 520/310	south east Qld; Simmental X Droughtmaster; cattle + crops; pasture feed base
AU 6500/1700	Northern Territory, Bos indicus; live export; pasture, mineral supplements feed base
AU 500/450	northern slopes NSW; Charolais X Angus; pasture, hay, sorghum feed base
AU 2700/930	central Qld, Bos indicus; cattle + crops; pasture, oats grazing feed base
AU 2300/750	Qld Gulf, Bos indicus; pasture, mineral supplements feed base

Figure A2: Location of Australian *agri benchmark* typical beef farms and cattle density



[10] A preferred method compared to compiling data from a group of individual farms and ranking them according to the average, or above- or below- average which is argued as a futile exercise in farm business management economics (Sefton and Cox,2005; Ferris and Malcolm, 1999; Mauldon & Schapper 1970).

[11] Such individual farm data is further 'typified' where necessary by replacing farm individual particularities by prevailing characteristics, figures, technologies and procedures.