

# How are global and Australian sheepmeat producers performing?

**Global *agri benchmark* network results 2018**



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# Highlights

## Sheepmeat

- Global food prices rose in 2017 and into 2018, led by dairy and sheepmeat – on rising demand (especially in Asia and the Middle East) and constrained supplies.
- Farm gate sheep prices were higher in most *agri benchmark* countries and farms in 2017, keeping profits high.
- Sheepmeat trade prices were particularly high in 2017 and 2018 and close to 2011 records, due to strong demand and supply constraints in Australia and New Zealand.
- Demand growth for sheepmeat over the next decade is projected to be faster than most foods and other proteins, due to growth throughout Asia and in the Muslim and Hispanic communities worldwide.
- While global sheepmeat supply is projected to respond to ongoing attractive profits, growing almost 20% in the coming 10 years (OECD-FAO), but still restrained by tightening land and environmental constraints.
- Hence, nominal sheepmeat prices are projected to hold firm over the next 10 years. While this implies a modest fall in real terms, prices (and profits) are expected to remain attractive and historically high – still above real prices prior to 2010, despite lower costs due to productivity growth.
- Global trade in sheepmeat is projected to rise slower than production in the coming decade (unless key market access restrictions are eased, especially in Europe).
- The main import demand growth is expected to be in developing countries, led by China and the Middle East.
- Australia is predicted to be the only exporter capable of supplying this demand growth, consolidating its new-found position as the leading sheepmeat exporter (over New Zealand) – with OECD-FAO predicting Australia's share of global exports to grow to 54% by 2027 (from 48% in 2017).
- Sheep farms globally continue to make profits at the whole farm level, and in some countries this is related to the level of diversification or government support.
- Australian and New Zealand sheep farms typically achieve medium-term profits, as do those in most other countries.
- In 2017, all of the seven typical sheep flocks analysed in Australia covered short- and medium-term costs at the enterprise level. Three of the Australian farms also covering long-term costs, with the remainder contributing to, but not fully covering, opportunity costs – an extraordinary result.
- Sheep farms globally generally experienced declining costs (in USD) from 2013 to 2016, especially for feed grains and fuel and in part due to exchange rate movements against the USD, but in 2017 there was a global increase in costs by around 10% from 2016 levels.
- Australia tends to have similar ewe and lamb losses to most other regions of the world, with the exception of South Africa, Brazil and France which are notably higher.
- Australian farms tend to have lower weaning rates than European countries, especially in Merino based systems, and maintain similar weaning rates to more rangeland or less-developed production systems where nutrition and/or genetics may be constraints.
- Australian systems generally maintain above-average growth rates for animals being sold or slaughtered at weaning, which is comparable to Europe and New Zealand.
- Australian sheep production systems produce the heaviest lambs globally, especially within grazing-based production systems.
- All Australian systems achieved cash costs of <USD2.30/kg lwt of sheepmeat produced. Globally, only farms from Uruguay, Colombia, South Africa, Namibia, China, New Zealand and one farm from Australia (VIC-3000) had total costs <USD2/kg lwt. Grazing-based systems are the least expensive for producing sheepmeat.
- Australian labour costs are over 10 times higher than in China or African and South American countries, and double that of New Zealand and most European countries. This is counteracted by Australian sheep systems producing 5-10 times more sheepmeat per hour of labour input than the rest of the world.
- Australian farms maintain a low total cost of sheepmeat production, together with farms in New Zealand, Uruguay, Colombia, Namibia and China, and some farms in Brazil and South Africa.



## Introduction

This report presents the *agri benchmark* network’s perspectives on recent global sheepmeat 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, how competitive are Australian sheepmeat producers and what are the main areas where our productivity differs from other countries?

The analysis and perspectives are as of mid-2018, though farm data is for the 2017 calendar year.

## What is *agri benchmark*?<sup>1</sup>

*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. The sheep network has 39 farms in 19 member countries, covering 55% of world lamb production and has been producing the results of comparative analysis over the last 7 years.

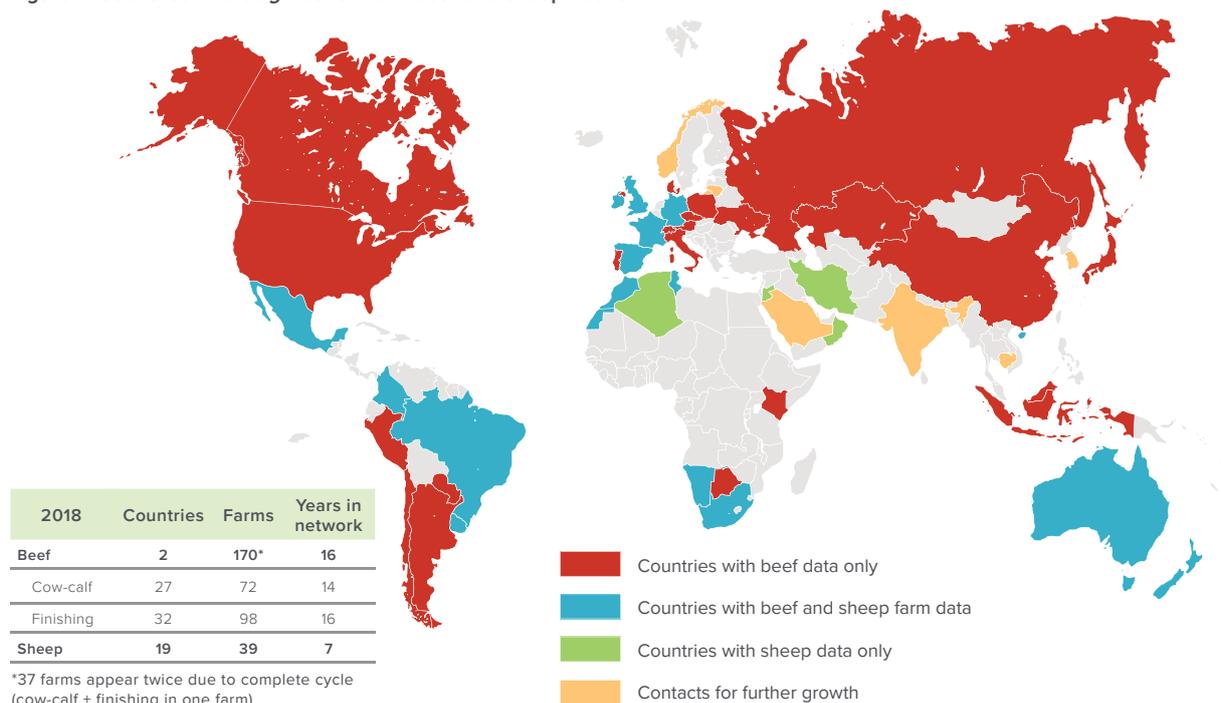
The core competence of the network is in analysing production systems, their economics, drivers and perspectives.

*agri benchmark* aims to assist:

- producers and their organisations to better align future production through analysis of comparative performance and positioning;
- non-profit organisations (governments, NGOs, international organisations) to monitor global agricultural challenges; and
- agribusiness to operate successfully through in-depth understanding of markets and customers.

*agri benchmark* has branches covering beef cattle and sheep, dairy, pigs, cash crops, horticulture, organic farming and fish. Within sheep, it covers breeding and finishing enterprises (ewes and lamb/sheep finishing). 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 sheep enterprise performance separately from (and together with) other outputs where the farm business is diversified (in Australia typically with some cropping, but often also other enterprises such as cattle).

Figure 1: Countries in the *agri benchmark* beef and sheep network



<sup>1</sup> See <http://www.agribenchmark.org/home.html>

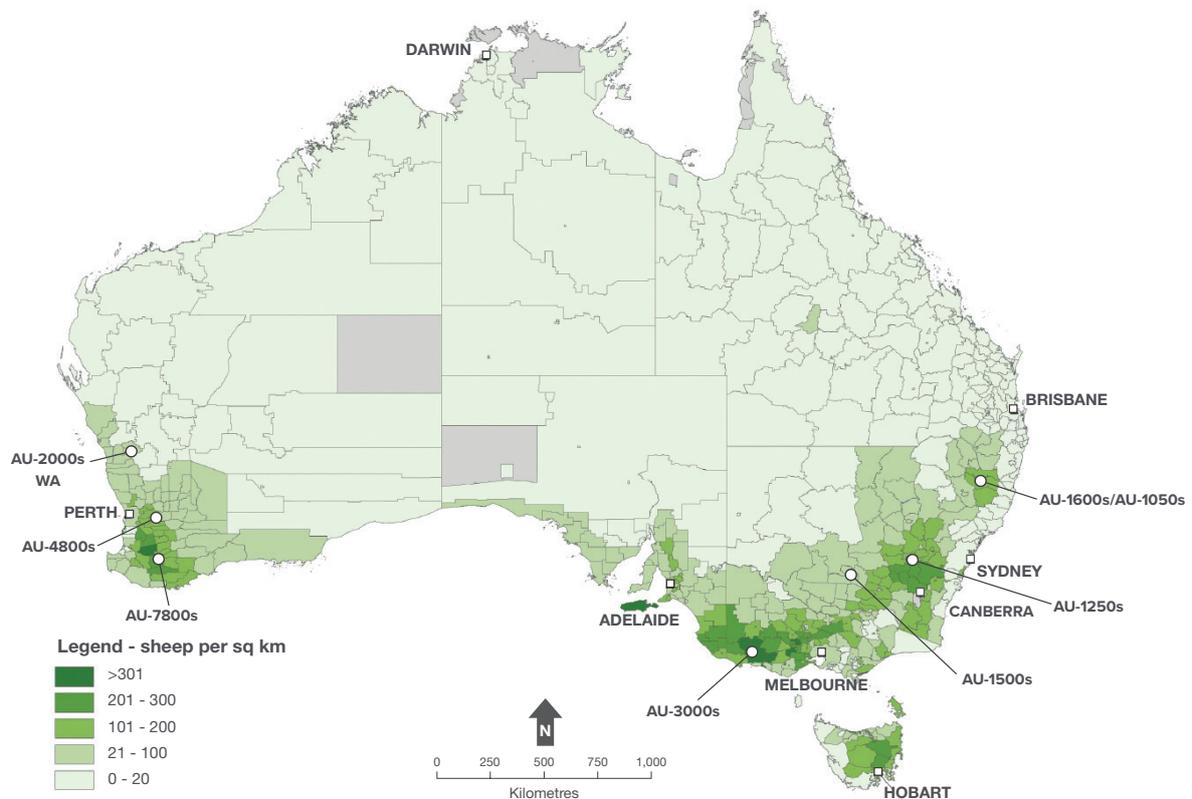
The farm-level results in this report are drawn from the collection of ‘typical farm’ data in each country, and subsequent analysis and research efforts of all member countries culminating in the 16th annual *agri benchmark* conference in Galway, Ireland, 15-20 June 2018.

‘Typical farms’ are farms ‘engineered’ by local producers and experts to be typical of a country’s main sheep production systems, using annual data drawn from farms in the key production regions. In Australia data is collected for seven typical sheep farms across NSW, Victoria and WA.

**Table 1: Australian *agri benchmark* typical sheep farms**

Held (ewes)	Farm make-up
AU 1250s	(1250 ewes) – NSW slopes; Border Leicester X Merino ewes, Dorset rams; sheep + crops
AU 1600s	NSW Northern Tablelands; Merino ewes, Dorset & Merino rams; sheep + wool + cattle
AU 1500s	NSW south western plains; Merino ewes, White Suffolk rams; sheep + crops
AU 2000s	WA low rainfall; Merino ewes, Merino & Poll Dorset rams; sheep + crops
AU 3000s	Western VIC; Coopworth X Dorset self-replacing
AU 4800s	WA medium rainfall; Merino ewes, Merino & Poll Dorset rams; sheep + crops
AU 7800s	WA high rainfall; Merino ewes, Merino & Poll Dorset rams; sheep + crops

**Figure 2: Location of Australian *agri benchmark* typical sheep farms and sheep density**



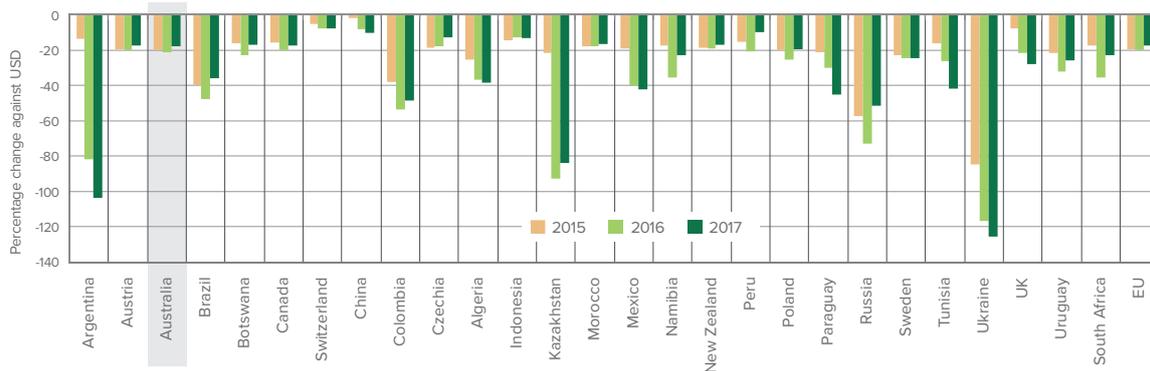
Source: ABS and *agri benchmark*

# Global price and cost trends

## Currency movements

The USD rose appreciably in 2015 and 2016 (see Figure 3) – by 20%-40% for most currencies but even higher against those in South America – exacerbating falls in global food and sheep farm prices in USD terms since their 2011-2014 peaks. However, when expressed in local currency terms, farm output and input prices rose. Currency fluctuations had less influence on developments in 2017, except notably for further falls in the UK pound and Argentine peso.

Figure 3: Change in currencies against the USD since 2014



Source: oanda.com and agri benchmark

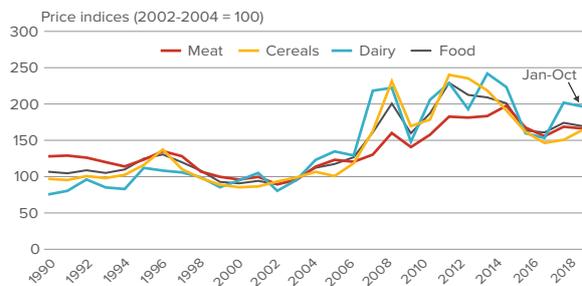
## Food and meat prices

Global food prices (in USD) doubled in the 10 years to 2011 and have been highly volatile over the past 15 years (see Figure 4). Currency volatility, especially the USD, has played a significant part in this, as has fluctuating crop harvests (and inventories) and growth in food demand and imports in developing countries, led by China.

Cereal and sheep prices peaked in 2011, but dairy product and other (more grain-dependent) meat price peaks were typically lagged by 2-3 years (beef production, in particular, takes time to adjust to changes in grain input costs) – peaking in 2013 and 2014, respectively.

Global food prices reached a low point in 2016 but were still 50% higher than prior to 2004. Since mid-2016, prices have mounted a significant recovery (in USD), especially for dairy products.

Figure 4: FAO global food price indices (based on USD prices)



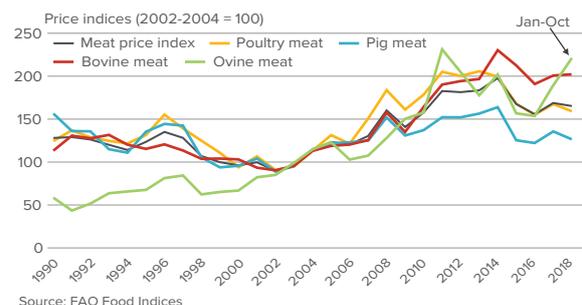
Source: FAO Food Indices

## Global sheep price trends

Sheepmeat prices (as measured by the FAO) have been on an upwards trend since 1990 (see Figure 5). The rise in the first decade to 2000 was in contrast to other meats, which all fell during the 1990s. Between 2005 and 2017, the sheepmeat price rise was in line with that in beef but faster than for the other meats. However, sheepmeat prices have been very volatile since 2010 and without a clear trend.

All meat category prices rose in 2017, and red meat prices continued to recover in the first seven months of 2018 (in USD terms, helped by some weakening in the USD), while pig and poultry meat prices lost most of the 2017 gains.

Figure 5: FAO global meat price indices (based on USD prices)



Source: FAO Food Indices

The FAO sheepmeat price index has been the recent standout, having risen 44% between the low of 2016 to 2018 (first seven months), leaving prices within 4% of the phenomenal peak in 2011. However, this partly reflects the fact that this price index is based on a New Zealand export lamb price only. While Australian prices have also closely mirrored this trend, sheepmeat prices elsewhere have not, notably in Europe, North America and China.

In 2017, sheepmeat prices rose in most major producing countries (*agri benchmark* farm data). The prices rise was substantial in Australia, South Africa and Namibia, due to post-drought supply falls and flock rebuilding. Prices rose less than 10% in most other countries. A notable exception was in China, where prices fell due to increased sheep slaughter – as small farmers left the industry, reducing the ewe flock. Prices also fell modestly in Algeria, Tunisia and Jordan.

However, sheep prices in local currency terms rose significantly in 2017 for almost all *agri benchmark* sheep countries (see selection of these countries in Figure 7), especially in South Africa, Australia and New Zealand (all recovering from recent severe droughts).

Figure 6: Sheep prices in USD: *agri benchmark* farms

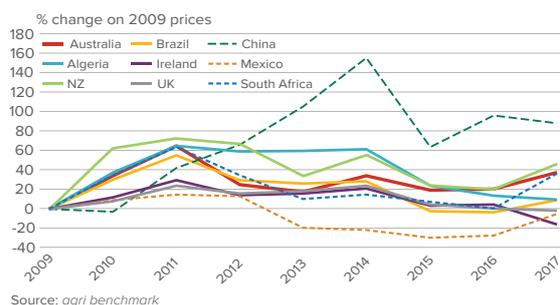


Figure 7: Sheepmeat price changes in USD and national currency in 2017



## OECD-FAO sheepmeat supply and price projections

The OECD-FAO in its latest Agricultural Outlook report (2018 to 2027, released in July 2018) projects slower growth in global demand for food over the coming decade, limited by slower population growth, and flat levels of per capita consumption for staple foods and meat products.

Amongst the protein sources, sheepmeat faces the brightest demand prospects, as it is a product preferred by consumers in the fastest growing population centres and ethnic groups – particularly within Muslim and Hispanic communities and in the Middle East, Africa and parts of South East Asia, and China. Also, it suffers from no religious taboos and, unlike beef, poultry and pig meat, has not encountered major disease or food safety incidents, such as BSE, African Swine Fever, SARS or E Coli.

Hence, demand growth for sheepmeat is projected to be faster than for poultry and pig meat, driven by population and income growth and urbanisation in Asia and continued growth in MENA.

“Lower product prices have contributed to making poultry and pig meat the meat of choice for consumers in developing countries but rising income levels allow those consumers to diversify meat consumption, gradually consuming more of the more expensive meat varieties such as beef and lamb.” (*OECD-FAO Agricultural Outlook 2018-2027*, page 150).

Global per capita consumption of sheepmeat is projected to grow from 1.7kg/person in 2017 to 1.84kg by 2027.



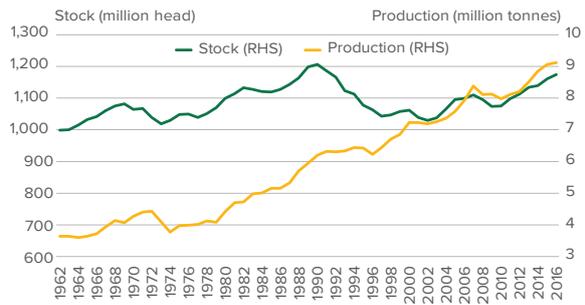
Continued demand growth is projected in China (as sheepmeat is seen as a quality and nutritious food), the USA (as the large Hispanic population expands and lamb establishes a niche as an alternate meat in foodservice), South Korea (due to China-influenced lamb BBQ and skewer meals), Japan (for high quality restaurants) and South East Asia (due to Muslim demand and tourism)<sup>2</sup>.

Global sheepmeat production is expected to expand faster over the coming decade (OECD-FAO Agricultural Projections, 2018) – by 19% between 2017 and 2027 – responding to recent good farm profitability and productivity growth. This continues a production growth trend evident for over 50 years. In the 40 years from 1960 to 2000, global sheepmeat production rose almost 90%, yet the global flock was largely unchanged (see Figure 8) – emphasising the role played by productivity growth, especially the shift from sheep for meat rather than for wool.

However, since 2000 much of the continued sheepmeat production growth has been from flock expansion in response to high profitability.

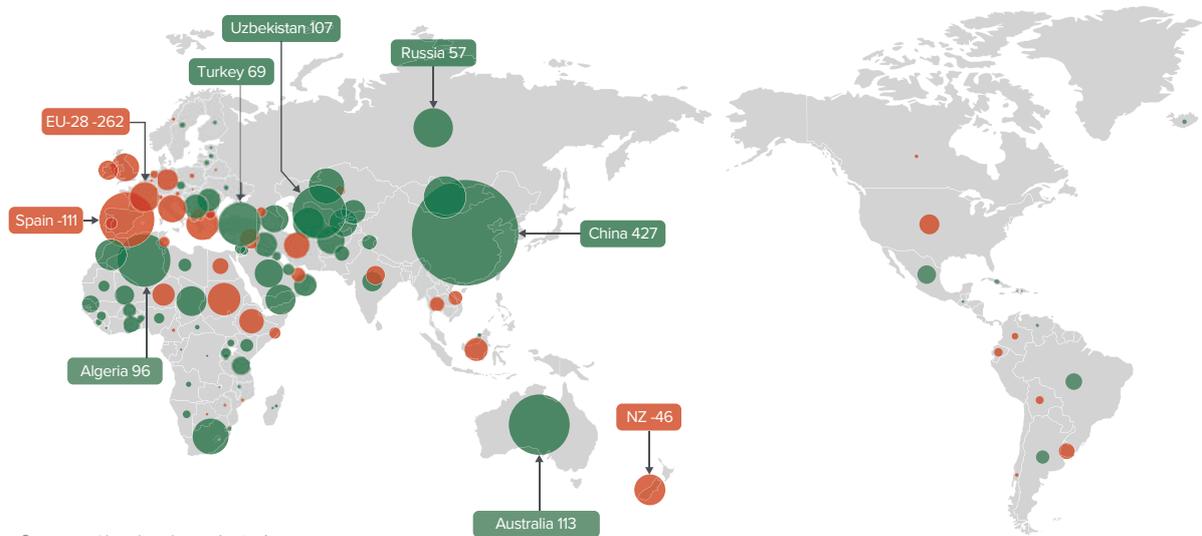
The main sheepmeat producers are China, Australia, New Zealand, the Middle East, Africa and Europe. Of these, China, Australia, the Middle East and parts of Africa are expected to be the main contributors to supply growth over the coming decade, joined by India and Pakistan (see Figure 9). Even Europe is tipped to see some recovery in production, led by Cyprus and Romania but also encouraged by increased coupled support payments in most sheep-producing EU countries. Sheepmeat production growth in New Zealand is expected to be minimal, and productivity-driven, as the shift to dairy continues.

**Figure 8: Global sheep flock and sheepmeat production**



Source: OECD-FAO

**Figure 9: Change in global sheepmeat production 2014-2016 vs 2004-2006 ('000 tonnes cwt)**



Source: agri benchmark mapping tool



<sup>2</sup> Ernesto Reyes and Alfredo Bellagamba, *agri benchmark* Beef & sheep Conference, Galway, Global sheep overview, June 2018

With a slowdown in demand growth and increased supply over the next decade, OECD-FAO projects sheepmeat prices to hold in nominal terms, but fall modestly in real terms, along with all other meats.

Despite the expected downward trend, sheepmeat prices and profits are projected to remain attractive and historically high – still above real prices prior to 2010, despite lower costs due to productivity growth.

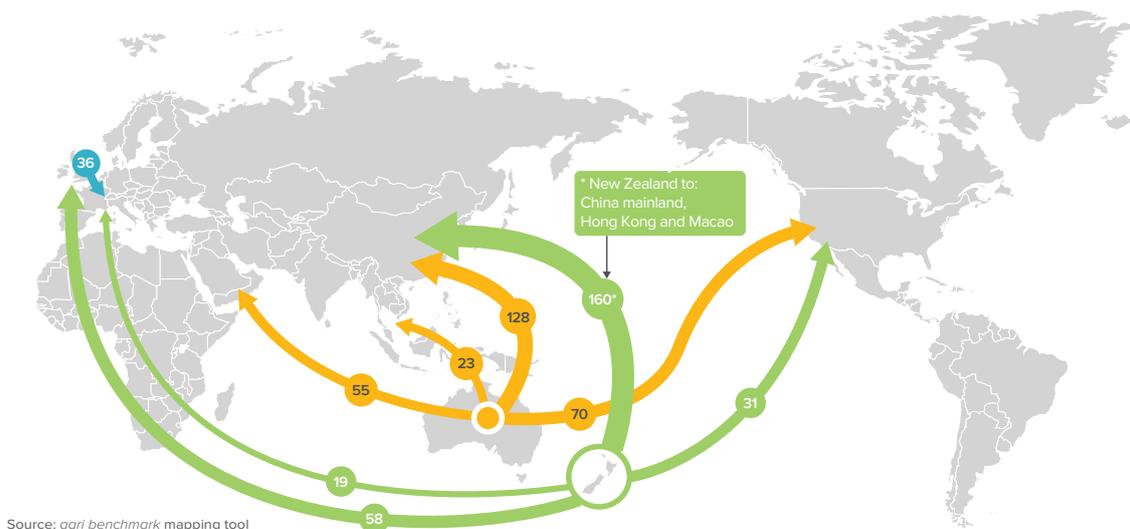
Another thing that sets sheepmeat apart from other meat proteins globally, in addition to a niche consumption profile, is its unique supply situation. Global sheepmeat prices are being kept high by supply constraints caused by the relationship with prices of other commodities from the animal (such as wool and milk); competition for grazing land and land use transitions to other enterprises (particularly grain and dairy); urbanisation and environmental considerations, especially land degradation (as sheep are often found on more arid or marginal agricultural land).

### Sheepmeat trade

Global sheepmeat exports are projected to continue rising slowly in the next decade (13% between 2017 and 2027), driven by import demand in developing countries, especially China and the Middle East. Trade could be considerably higher in the event of market access liberalisation, with the launch of Australia and NZ FTA negotiations with the EU in 2018 and potential for a future agreement with the UK following Brexit holding considerable potential (given recent falls in EU sheepmeat production).

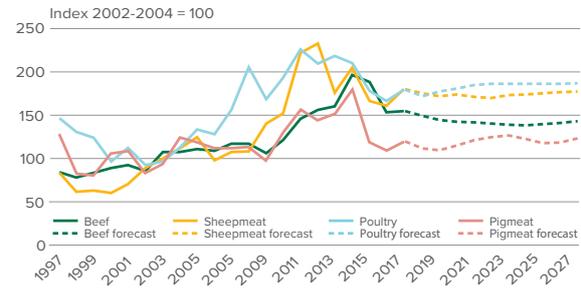
Australia overtook New Zealand as the largest sheepmeat exporter in 2017 and looks set to further strengthen its trade position over the coming decade. Together, Australia and New Zealand commanded 90% of world sheepmeat exports in 2017, with Australia having 48% and New Zealand 41%. Figure 12 shows the 10 largest trade flows, with Australia and New Zealand mainly head-to-head in China and the US, New Zealand the main supplier to the EU (under a large quota relative to Australia's) and Australia the dominant supplier into MENA and South East Asia.

Figure 12: Top 10 sheepmeat trade flows 2017 ('000 tonnes)



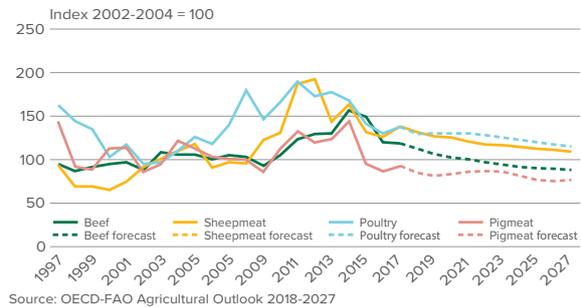
Source: agri benchmark mapping tool

Figure 10: OECD-FAO Meat Price Projections (nominal)



Source: OECD-FAO Agricultural Outlook 2018-2027

Figure 11: OECD-FAO Meat Price Projections (real)

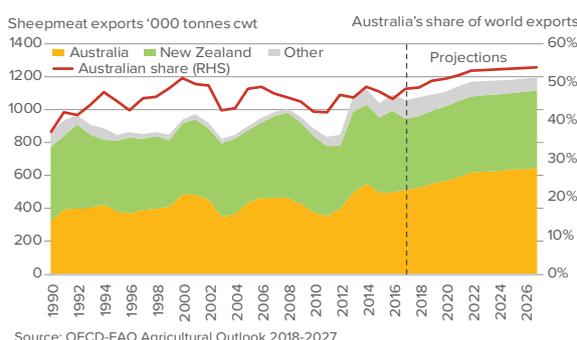


Source: OECD-FAO Agricultural Outlook 2018-2027

OECD-FAO projects a further 26% rise in Australian sheepmeat exports by 2027, taking its share to 54% of world trade – see Figure 13.

Australia's competitors in the sheepmeat trade are all expected to face major supply and export constraints in the next decade, with New Zealand exports projected to rise only 8% and the rest of the world falling from 11% to only 7% of world trade. If sheep enterprise profitability remains attractive, as anticipated, South American suppliers could emerge as significant competitors, given the availability of pasture and grain.

**Figure 13: Global sheepmeat exports 1990-2027 (forecast)**



## Other major developments highlighted

### Production sustainability

The issue of meat supply chain sustainability and animal welfare were again front-line issues at the 2018 *agri benchmark* conference<sup>3</sup>.

Environmental restrictions are having negative impacts on sheep production in many countries, including significant recent policy changes in China, New Zealand and the EU. This year's Conference contained significant contributions in this field, notably a presentation by Ernesto Reyes entitled *Recent approaches for assessing sustainability at different levels*, addressing progress in defining sustainability and measuring of a farm's environmental sustainability and animal welfare.

Another presentation by Kevin Kilcline (Ireland Agriculture and Food Development Authority) entitled *Assessing GHG emissions across the Irish sheepmeat value chain* covered the progress in measuring the carbon footprint on Irish sheep farms.

Results of a global consumer survey on sustainability were presented to the Conference by Michael Maloney (Director of Origin Green) of the Irish Food Board.

Within the social sustainability sphere (sustainability is commonly divided into environmental, social and economic segments), the issue of animal welfare is growing, as live cattle and sheep trade expands worldwide. This issue is receiving increased attention globally. In Europe, it is being elevated by the growth in trade from EU countries to Turkey, the Middle East and North Africa.

### The impact of emerging technologies on sheep producers

Claus Deblitz, coordinator of *agri benchmark* beef and sheep, raised the 'sleeping' issue of fundamental scientific innovations that are likely to revolutionise farming – notably genome editing (altering DNA), artificial intelligence, blockchain (supply chain information technologies) and alternative proteins. Some of these technologies have the potential to greatly enhance production efficiency but will require changes to traditional farming. These changes will probably challenge the place of smaller scale, older and part-time farmers. Alternative protein sources like insects, aquaculture and clean meat, rather, constitute a larger threat to the present way of livestock farming. Feeding insects as a protein source to animals could offer a new pathway for feed protein supply.

### Sheepmeat market access uncertainty

Meat market access was again a major concern of network countries at the 2018 *agri benchmark* Conference, heightened by the US trade threats (especially against China, Turkey, Mexico and Canada), Brexit, regional trade deals (such as the Regional Comprehensive Economic Partnership or RCEP) and the proliferation of bilateral trade deals recently struck or in the pipeline (following the failure of global multilateral efforts).

<sup>3</sup> See 2018 *agri benchmark* Conference Global Forum presentations by: Ernesto Reyes, *agri benchmark*, *Recent approaches for assessing sustainability at different levels*; Kevin Kilcline, Ireland Agriculture and food development Authority, *Assessing GHG emissions across the Irish sheepmeat value chain* and Michael Maloney, Irish Food Board, *Origin Green*.

Combined, the renewed push towards protectionism in key countries (led by the US) and rejection of multilateral agreements in favour of bilateral free trade agreements, threatens to reverse the gains from trade liberalisation over the past 30 years and further distort sheepmeat trade flows.

The EU is in the process of negotiating FTAs with Australia, New Zealand, Mercosur and the UK (Brexit). Brexit is of immense concern to sheepmeat producers in both the UK and Ireland and to major sheepmeat exporters to the EU and UK – New Zealand and Australia. The UK is the dominant market for Irish beef and the loss of access would impact the local industry. Brexit has already caused a slump in Irish sheepmeat prices, following the associated major devaluation in the UK pound against the Euro.

## Global performance of sheep farms

### Whole farm profitability ('000 US\$)

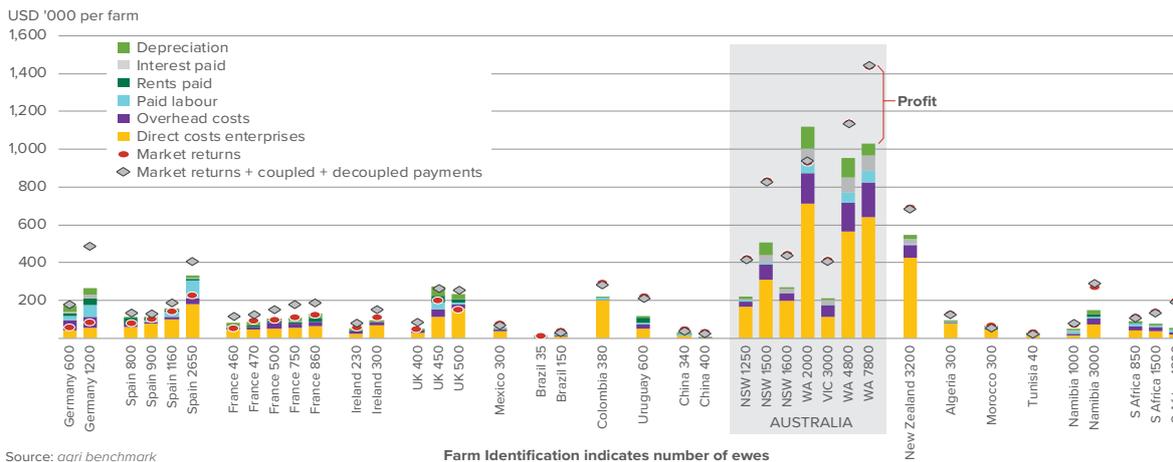
All but 4 of the 39 typical sheep farming systems (across 17 countries) managed to make a profit at the whole farm level in 2017, although this is partly dependent on other enterprises or non-farm returns (coupled and decoupled government payments).

On a whole farm profit basis (medium-term profitability), Australia's 'typical' sheep farms were the most profitable (in US\$ terms), predominantly due to their scale and incomes received from other enterprises (crops and beef). In absolute terms, and similar to 2014, 2015 and 2016, the most profitable farms globally were from Western Australia (AU-7800), followed by other Australian farms in the South West Slopes of NSW (AU-1500).

Australian sheep farms generally maintain higher levels of absolute profitability due to the diversification of the typical mixed farming systems and their scale. In 2017, cropping returns in particular, especially in WA, were a major contributor to whole farm profitability. Notably, however, the WA farm, WA-2000, achieved a loss for the first time in 2017 due to higher sheep feeding costs and significantly lower crop gross margins.

On average, European farms achieved a net profit margin of -49% without government payments in 2017 (without payments, only the Irish farms and one French farm were profitable), but with payments achieved an average net profit margin of 25% (with all but one UK farm generating a profit), whereas Australian farms averaged 28%. On average, this represents another small improvement in EU profitability and a steadying of Australian farm profitability when compared to 2015 and 2016, although some individual farms have experienced significant changes.

Figure 14: Whole sheep farm profitability ('000 US\$)



Source: agri benchmark

## Sheep flock profitability (US\$/100kg lwt)

When the 2011 to 2017 profitability of the sheep flock is examined, without taking into account income from other enterprises on the same farm or farm level government payments, the global economic performance was generally positive (better than for beef cattle) in the short- to medium-terms.

The majority of sheep farms can easily continue to operate in the short- to medium-term and cover their cash costs and costs of replacing plant and equipment (which is notably higher in European and Brazilian systems). The exceptions to this are one of the German farms, and the Spanish, UK, Moroccan and the Tunisian farm.

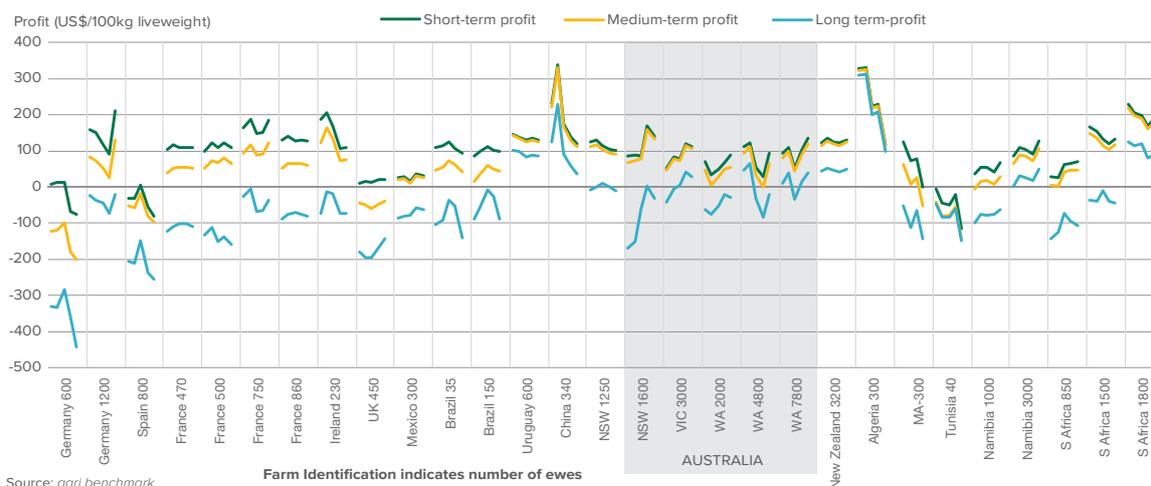
Many countries are not currently long-term profitable, even with significant government payments (excludes decoupled payments). The exceptions to this is Uruguay, New Zealand, China, and some systems in Australia and Africa.

In 2017, all of the typical sheep flocks analysed in Australia covered short- and medium-term costs (includes depreciation), with three of them (NSW-1500, VIC-3000 and WA-7800) covering long-term costs (opportunity costs) and the remainder contributing to, but not fully covering, opportunity costs. For the majority of Australian systems (excluding WA-4800 and WA-7800) this improved from 2011 to 2017.

While farm profits in Australia, South America, France, the UK and Africa have been increasing, the profitability of sheep flocks in many other parts of the world has trended downwards since the price peak in 2011, particularly in Germany, Spain, China, Uruguay, Algeria, and some systems in France and South Africa.

In 2017, medium-term profitability was lower than the year before in one of the German farms (Germany 600), two French farms, Spain, Brazil, China (after a dramatic increase in 2014, it is now achieving the lowest levels of profitability since 2011), two Australian farms, New Zealand, Namibia and two of the South African farms.

Figure 15: Time series of short-, medium- and long-term profitability from 2013-2017 (US\$/100kg lwt)<sup>4</sup>



Source: agri benchmark



<sup>4</sup> Short-term profit is where income (from sales and coupled government payments) covers all cash costs (including interest and paid wages), medium-term profit allows additionally for depreciation, and long-term profit allows for the opportunity costs of family labour, land and other capital invested. Opportunity costs on capital such as land, is calculated using a market leasing rate in each country and region.

# How efficient are Australian sheepmeat producers?

## Total returns (US\$/100kg lwt)<sup>5</sup>

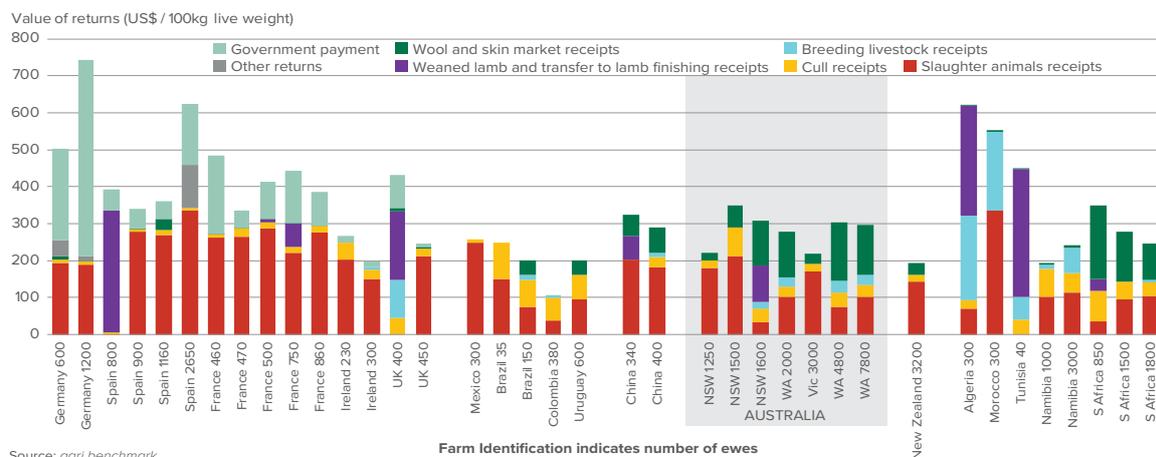
Australian sheep systems are diversified in comparison to the rest of the world, with wool and cropping being major sources of additional income. The majority of Australian systems are in mixed farming zones, representing areas of highest sheep production and flock sizes. Wool income, which continued to increase from 2013 levels, is only a significant contributor to income in Australia, New Zealand, China, Uruguay, South Africa and one farm in Brazil. Other countries, like the UK, New Zealand and Uruguay, also commonly maintain diversification with cattle enterprises.

Australian and New Zealand typical sheep farms are the largest by global standards, having from 2 to 8 times higher total returns (revenue) from the business compared to global competitors.

There is large global variation in total returns (revenue) per 100kg lwt sold. Most of the sheep systems in the EU countries receive significant amounts of government payments. These are either whole farm payments (United Kingdom), livestock payments or a combination of the two (all other EU countries).

In Australia, total sheep enterprise returns for the eastern typical farms continued to increase in 2017 across most categories in comparison to the 2013 to 2016 period. For the Australian Merino dominant typical farms (NSW-1600, WA-2000, WA-4800 and WA-7800) wool returns made up 40-50% of total returns, only matched by the South African farms. Notably, the NZ typical farm experienced a slight increase in its total returns from 2016 after halving from 2015 levels, primarily due to lower slaughter animal receipts.

Figure 16: Total sheep enterprise returns (US\$/100kg lwt)



## Total live weight sold per ewe (kg lwt per 100kg ewe lwt)<sup>6</sup>

Generally Australian systems with a primary lamb production focus produce above average amounts of live weight per ewe. The highest production per ewe in grazing-based production systems in 2017 came from VIC-3000 which is based on a self-replacing meat breed flock. This was followed by NSW-1250, one UK system and another dedicated lamb producing flocks, NSW-1500, all of which exceeded other meat producing flocks in Europe. The distribution of the other Australian typical sheep farms across the grazing-based production systems, relates to the flock balance of Merino and meat breeds, with the lowest ranked Australian system, NSW-1600, based on a fine wool Merino flock with only a small proportion used for first-cross lamb production.

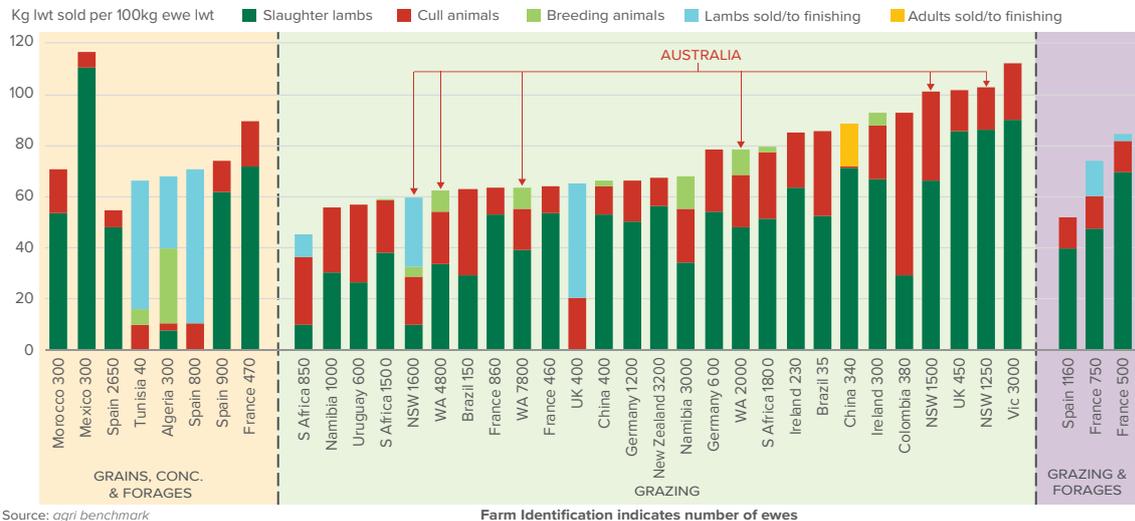
Low levels of production per hectare tend to come from regions with lower rainfall and rangelands environments (China, Brazil, Jordan, Namibia, South Africa and some parts of WA). Moderate-to-high productivity occurs in higher rainfall regions across Europe, Australia and New Zealand. Very high land productivity occurs in systems in Mexico and Tunisia, where animals are housed.

<sup>5</sup> Total sheep enterprise returns include all returns of the sheep enterprise: cull and slaughter animals, breeding returns and store lambs, wool returns and level government payments.

<sup>6</sup> Total live weight sold per ewe is generally dominated by the sale of slaughter lambs in most production systems, although a few exceptions exist where there are well established finishing systems (UK, Spain, Algeria and Tunisia).

Comparatively, Australian farms found in lower rainfall zones of WA are similar to Uruguay, China, and parts of Europe (Spain and Germany). The higher rainfall farms found in south west WA, western Victoria and central NSW have comparable land productivity to European, UK and New Zealand systems.

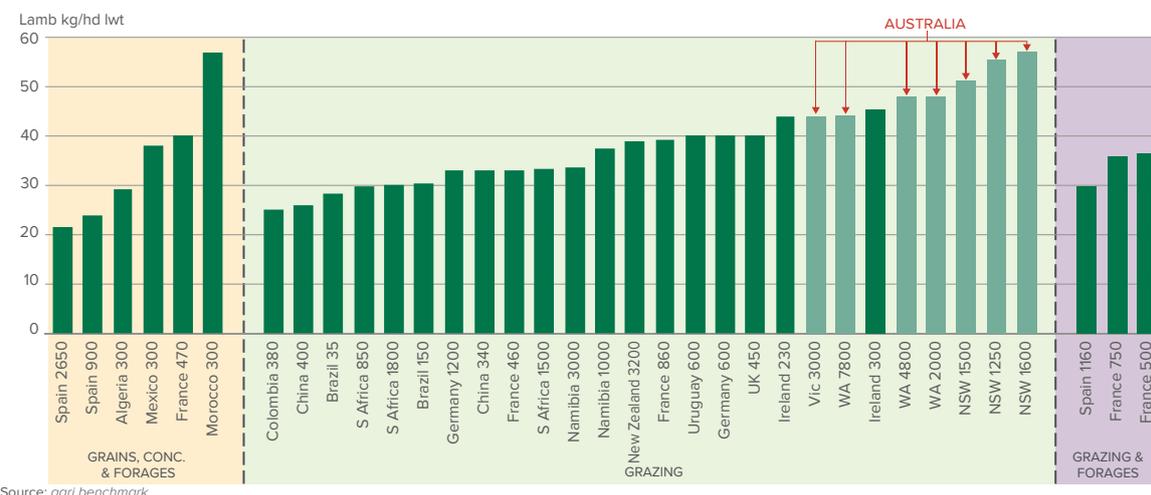
Figure 17: Total liveweight sold per 100kg ewe live weight (kg)



## Lamb carcase weights

Australian sheep production systems tend to produce the heaviest lambs globally, especially within grazing-based production systems. Only typical farms from Ireland produced lambs to a weight heavier than, or equivalent to, some of the Australian farms. Markets and processors in some countries prefer lighter carcase weights (for example, less than 21.5kg cwt in the UK) to meet demands from consumers on serving and cut sizes. The ranking within Australian systems changes somewhat between years in response to seasonal conditions, through both changes in growth rates and in the economic benefit of adding additional weight to slaughter lambs.

Figure 18: Lamb slaughter weight for different production systems



## Losses of ewes (annual) and lambs (birth to weaning)

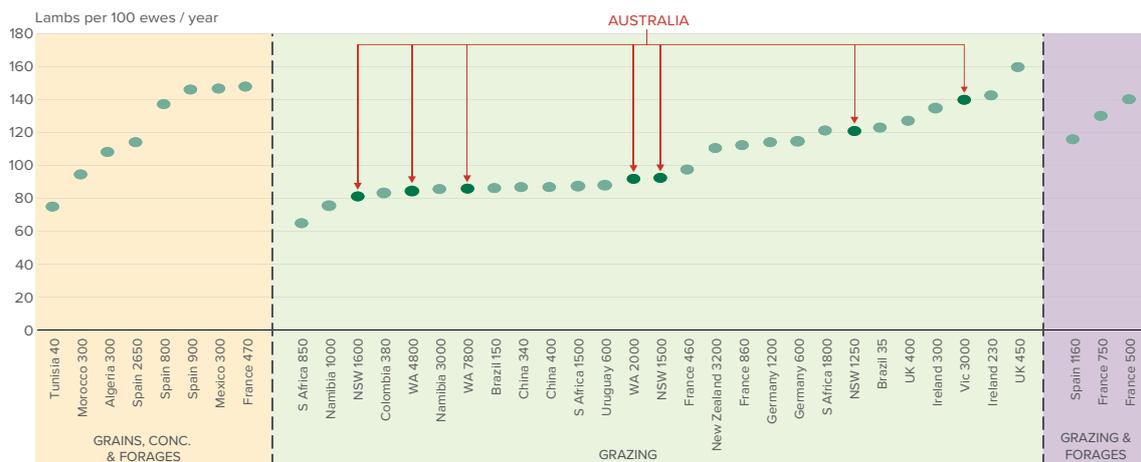
Australia tends to have similar ewe and lamb losses to most other regions of the world, with the exception of South Africa, Brazil and France, which are higher. In South Africa this is predominantly caused by predators, particularly the Jackal, and in Brazil by the rangelands systems under which they run. In France, high losses are due to their intensive multiple lambing systems, high proportions of multiple births, and a shift in focus to meat production (with reduced emphasis on mothering ability). Ewe losses globally tends to vary between 1% to 7%, while lamb losses vary from 1% to 17%, with Australian systems maintaining ewe and lamb losses at 3% to 6%.

## Weaning rates

European farms tend to have higher weaning rates than Australian farms, primarily due to more prolific breeds in addition to nutrition (supplementary feeding) or, as occurs in France and Spain, multiple lambing's per annum. Australian farms tend to maintain similar weaning rates to more rangeland or less-developed production systems where nutrition, mortalities and/or genetics may be constraints.

This, more than likely, presents the area of greatest opportunity for Australian production systems, depending on the cost-effectiveness of increasing weaning rates, although flocks from higher rainfall regions (Vic-3000 in western Vic) or flocks designed for lamb production (NSW-1500 and NSW-1250) achieve comparable weaning rates to the representative European and New Zealand systems. Notably, the Australian typical farm, Vic-3000 achieves a high weaning rate, and, although having the lowest slaughter weight for sold lambs, maintains the highest lamb and sheepmeat production per 100kg of ewe liveweight in grazing-based systems.

Figure 19: Weaned lambs per 100 ewes per year



Source: agri benchmark

Farm Identification indicates number of ewes

## Lamb growth rates

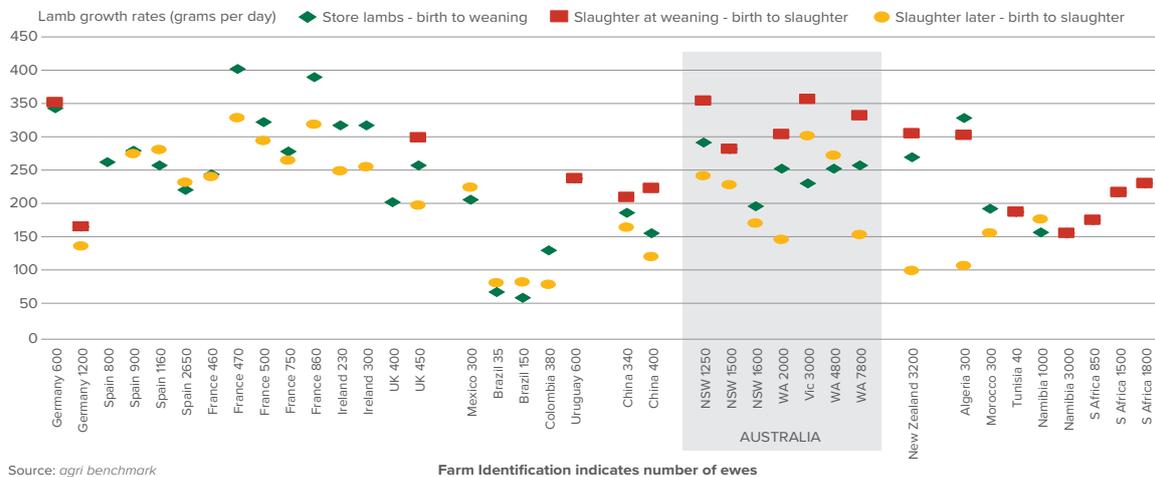
Lamb growth rates on typical Australian farms varies significantly, though Australian systems generally maintain above average growth rates for animals being sold or slaughtered at weaning – comparable to most global regions, including Europe and New Zealand.

However, for lambs grown out beyond weaning (slaughtered later), Australian growth rates are mixed but still average above those in New Zealand, Brazil and Colombia. However, they tend to be below those in the more intensive European meat lamb production systems for around half of the Australian systems which are based on Merinos. Feed quality and quantity, and genotype, also strongly influence growth rates, which is highlighted when comparing average lamb growth rates across different categories of sheep production systems. Generally, one of the German farms, China, and the African and South American countries have the lowest lamb growth rates.



Global weaning age mostly varied from 90-135 days, ranging from 45-60 days in Spain and 65-90 days in France (due to very light slaughter weight markets), Mexico, and Algeria (due to lamb finishing systems), and up to 180 days in Germany (due to on-farm lamb finishing) and Namibia (nutritional and management constraints).

Figure 20: Lamb growth rates for store and slaughter lambs: from birth to weaning or slaughter (g lwt/day)

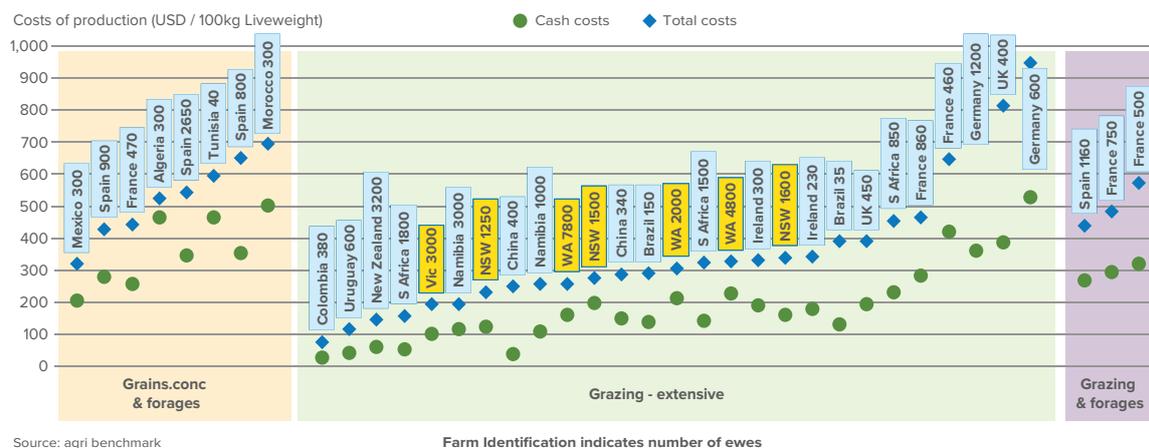


## Cash and total costs of sheepmeat production<sup>7</sup> (US\$/100kg lwt)

It is noticeable that many countries have well over US\$2/kg lwt cash costs (including shearing expenses). All Australian systems achieve cash costs of <US\$2/kg lwt, except for WA-4800 and WA-2000 with cash costs of \$2.26 and \$2.10/kg lwt respectively. Notably, the only systems that achieve cash costs of <US\$2/kg lwt are based on extensive grazing systems, with all other systems (based on grains/concentrates and forages) being more expensive in producing sheepmeat.

The changes in total costs of sheepmeat production across the world from 2012 to 2017 were mixed, but overall costs declined globally until 2016, with a general increase in 2017. This in part reflects exchange rate movements against the USD. In 2017 costs were generally held constant in China and New Zealand, but increased in Europe by 11%, MENA countries by 10%, Mexico and Uruguay by 16%, and South Africa/Namibia by 11%. In Australia, the average total cost rose by 12% after experiencing reductions over 2013 to 2015 and a slight increase in 2016. Since 2013, Australian systems have averaged a reduction of 3% per annum.

Figure 21: Cash and total long-run costs of sheepmeat production under different production systems (US\$/100kg lwt)



<sup>7</sup> The cash or non-factor costs represent largely variable costs directly associated with the enterprise. Feed and machinery are the dominant non-factor costs in Europe, with feed costs predominating everywhere else, except AU, NZ, CN UY and NA. Other inputs to ewe enterprises are directly allocated cash costs, such as enterprise specific wages (shearing, marking etc), and these represent major costs to Australian systems. Animal purchase costs are also important in AU-1250, as it is a non-self-replacing system (i.e. buys replacement ewes). Total long-run costs allow for depreciation and opportunity costs (including labour, land and capital).

## Labour costs and productivity

Labour costs in Australia are amongst the highest in the world, but have declined since 2013 in US dollar terms. Australia’s average wages paid for employed staff was around US\$24/hour in 2017, with the opportunity cost of family labour around US\$29/hour. China and European countries averaged \$2/hour and \$14/hour respectively, whereas South American and African countries averaged \$3/hour and \$2/hour respectively. New Zealand’s labour costs have also declined to around \$16/hour.

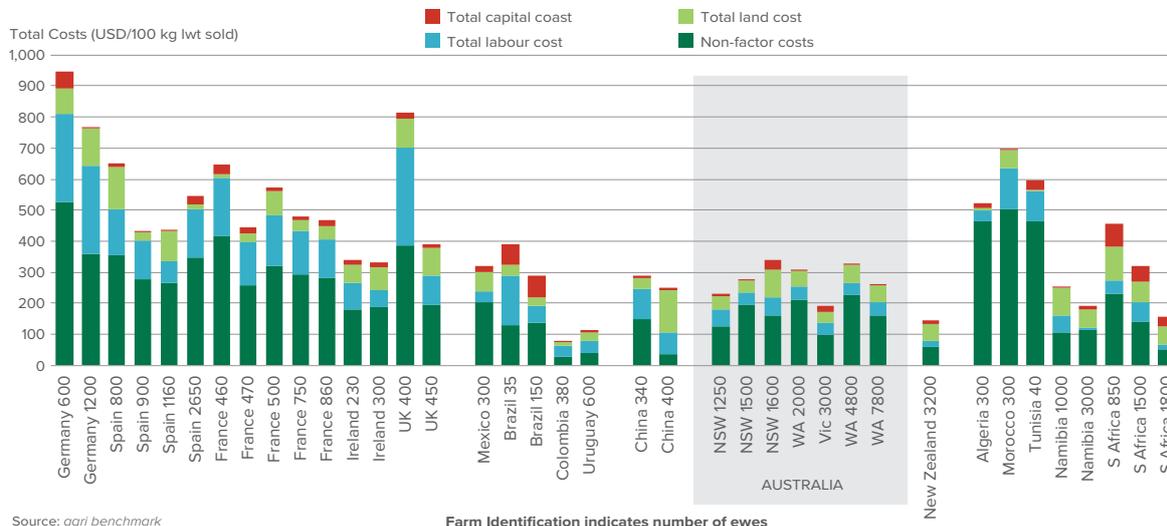
The contribution of labour to the costs of producing sheepmeat in Australian sheep systems is amongst the lowest in the world, even when compared to countries with very low absolute labour costs. In terms of labour productivity, Australian and New Zealand sheep systems produced 50-82kg live weight per hour of input, compared to around 10kg lwt/hour for European systems and generally less than 10kg lwt/hour for most South American, African and Chinese systems.

This results in Australia and New Zealand having some of the lowest labour costs per amount produced (\$45 and \$20/100kg lwt, respectively in 2017) when compared with Europe (\$155/100kg lwt), China (\$84/100kg lwt) and South America (\$65/100kg lwt). Only some of the systems in the MENA and African countries achieve similar labour costs per amount produced to Australia and New Zealand.

## Total costs of meat production<sup>8</sup> (US\$/100kg lwt)

Overall, Australian farms maintain a low total cost of sheepmeat production, with non-factor costs being the largest contributor to total costs. New Zealand, Uruguay, Colombia, Namibia, China<sup>9</sup>, and some farms in Brazil and South Africa also maintain low total costs. In most countries, 50-60% of costs are the non-factor costs or the operational costs of running the enterprise. Feed and machinery represent the largest non-factor costs in European and some South African systems, with feed being the predominant non-factor cost in Spain and MENA countries, and animal purchases in some Chinese and Australian systems. It is quite mixed for all other parts of the world.

Figure 22: Total costs of sheepmeat production (US\$/100kg lwt)



Source: agri benchmark

Farm Identification indicates number of ewes

<sup>8</sup> Total costs include all allocated whole farm costs, as well as opportunity costs for labour (family labour), land and capital used. This represents a long-run cost of production. For capital, land and labour costs it includes opportunity costs of land, non-land assets and family labour.

<sup>9</sup> In China, land cost is difficult to estimate due to farmers maintaining only the right of use for 30-50 years, whereas renting usually only occurs for 12 months at a time.



## In comparison...Australian sheep systems have:

- Moderate losses, mortalities and wastage in the system.
- Moderate-to-low reproductive efficiency in Merino based flocks – with potential for further improvement through nutritional management and genetics, if economic to do so.
- High lamb carcase weights that exceed most other parts of the world.
- Moderate-to-high meat production efficiency, especially from meat-focused systems.
- Above-average growth rates for animals sold or slaughtered at weaning.
- High labour costs, but excellent labour productivity which makes Australia competitive in terms of labour costs per amount produced.
- Moderate sheep returns, which have continued to increase above 2013 to 2015 levels, with wool returns being a major driver in Merino based systems.
- Maintained low total costs of production which tended to decline year-on-year from 2012 to 2016, but increased in 2017.
- Had a mix of increases and decreases in enterprise profitability in 2017.
- Good and continuing sheep enterprise profitability across most systems in the short- and medium-term, in alignment with global trends.
- Achieved or are approaching long-term profitability, which is extraordinary both historically and relative to other countries.

## Australia



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