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The economic impacts of regulating live sheep exports

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Foreword

This report presents an update of economic analysis and advice prepared in mid-2018 on the likely impacts of potential regulations and disruptions to live sheep exports from Western Australia. It compares expected economic impacts to actual economic outcomes and to analysis commissioned from other providers.

The report is an example of the type of economic analysis and advice that ABARES provides on emerging industry issues to policy colleagues in the Department of Agriculture, Water and Environment and other agencies.

In 2018 public concerns about the live sheep trade led the Australian Government to consult on regulations designed to help the industry retain its social licence by reducing risks to animal welfare. This report summarises the analysis and advice ABARES provided on the industry and market impacts of regulatory options between 2018 and 2019.

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Summary

Live sheep exports are an important part of the strategies that Western Australian sheep farms use to manage the risks associated with a short growing season in spring. Over the 3 years to 2020, the Australian Government assessed regulatory options designed to improve the welfare of sheep shipped to the Middle East. Most of these options involved reducing the density of sheep on ships or restricting exports to the cooler months in the northern hemisphere. This report summarises economic analysis provided by ABARES on the likely economic impact of restricting live exports on the WA sheep industry. It also explores the extent to which these likely impacts were later observed in available data.

ABARES analysis showed that the economic impacts of restricting live sheep exports were more than offset by strong global demand for Australian sheep meat between 2018 and 2020. Evidence indicates that some sheep destined for live export were diverted to domestic processing as prime lambs or used to restock flocks to produce wool. Saleyard prices in Western Australia were 10% to 20% lower than they may otherwise have been in late winter and early spring but were driven to historically high levels by strong export demand.

Using conservative assumptions about the pace of industry adjustment, ABARES estimated that the combined incomes of around 4,000 sheep farms in Western Australia could be up to \$68 million lower in the short term than they would have been in the year that export restrictions were first introduced. In the long term, the reduction in collective incomes was estimated to be \$12 million per year as markets adjusted. Other estimates of the predicted falls in sheep industry incomes range between \$4 million and \$84 million – varying with the perspective taken and methods used.

1 Introduction

In 2018, public confidence and attitudes towards the live sheep export trade was affected by publicity around heat stress suffered by sheep shipped to the Middle East, particularly during the months of the northern hemisphere summer (DAWE 2020). In response, the Australian Government placed additional conditions on live sheep exports in the northern summer of 2018, and temporary restrictions on the trade from June to September 2019. This provided time for research and consultation into improved regulations designed to protect sheep from heat stress on long voyages. The result was the Australian Meat and Livestock Industry (Prohibition of Export of Sheep by Sea to Middle East—Northern Summer) Order 2020 to regulate sheep exports to the Middle East between 1 May and 31 October each year.

Throughout the Australian Government's consultation on regulatory options, ABARES provided analysis and advice on the potential economic impacts that restricting live exports was likely to have on the Australian sheep industry. This analysis focused on the sheep industry in Western Australia where most sheep for live export have historically been sourced. Key findings from ABARES background analysis were later incorporated into the regulatory impact statement prepared to evaluate regulatory options, [Live sheep exports to, or through, the Middle East—Northern Hemisphere summer: Regulation impact statement](#) (DAWE 2020).

This report provides in-depth insights into ABARES economic analysis of potential industry impacts and updates the data available to assess the extent to which these predicted impacts were later observed.

The merits and impacts of restricting live sheep exports have been contested. This report concludes by comparing ABARES analysis with studies commissioned by industry and animal welfare groups.

2 Expected economic impacts

2.1 The economics of live sheep exports

Australian farmers – mostly located in Western Australia – sell sheep for live export because it is more profitable than alternative marketing strategies. Most of Western Australia's pastoral areas have a short growing season, which adds to the risks associated with prime lamb production. A short growing season means that lambs may not reach the weight or quality standards of the prime lamb market before hot summer conditions restrict pasture growth, necessitating supplementary feeding. Live exports provide WA sheep farms with a more flexible market than prime lambs in terms of age, quality and timing of delivery. This flexibility can be used to manage the risks associated with a short growing season. This means that a farmer can set out at the beginning of the season to produce prime lambs, but sell these sheep for live export at reasonable prices if seasonal conditions prove unfavourable.

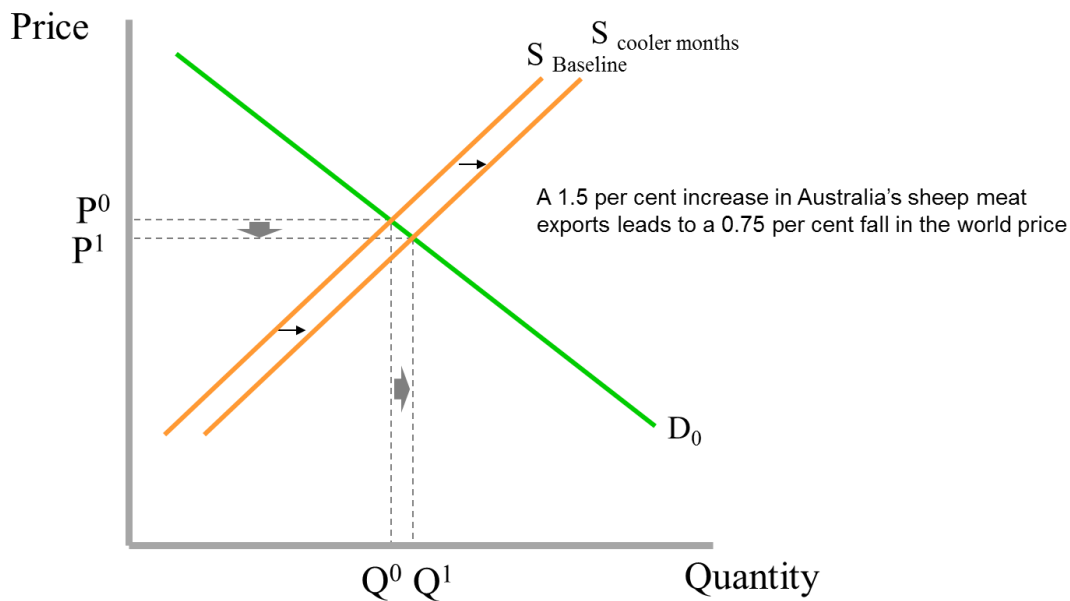
If the live export trade was phased out during the hotter months of the northern hemisphere (May to September), farmers producing sheep for live export would switch to alternative marketing strategies. Farmers would have a strong price incentive to adjust farm production to finish more prime lambs for local slaughter, and to harvest more wool and sell more sheep for local processing as mutton while this adjustment was taking place. Most sheep farms in Western Australia already produce prime lambs. However, supplementary feeding is often required to bring lambs up to market specifications. These additional feed costs could result in lamb production no longer being profitable for some producers, leading them to concentrate on other activities such as cropping.

2.2 The market impacts of restricting live exports

Restricting live sheep exports would have 2 distinct market impacts. First, global sheep meat prices are likely to fall in the short term as supply increases. Australia's sheep meat prices are largely set in world markets, where Australia and New Zealand each contributed just over one third of world exports in the 5 years to 2016 (prior to disruptions to the live sheep trade). Australia's large share of world trade means that world prices are likely to fall somewhat if exports increase. However, the potential increase in supply is small compared to the volume of world trade. If 50% of the sheep exported live in 2017 were slaughtered in Australia and exported as meat, the world supply of sheep meat would increase by only 1.5%. Prior to restrictions on the trade in 2018, live sheep exports were distributed evenly throughout the year. This means that restricting live exports to the 6 or 7 cooler months of the year in the northern hemisphere roughly translates into a 50% reduction in exports.

World sheep meat prices are unlikely to fall as much as this small increase in supply. Consumption of sheep meat in importing nations is likely to be higher than it would otherwise be, due to a slight fall in price. However, consumers in Middle Eastern nations are expected to continue a long-term trend of substituting away from lamb towards other types of meat. Part of the household budget they save as a result of lower sheep meat prices is likely to be spent on chicken and other kinds of meat, as well as other types of food and non-food items. This means that the price elasticity of sheep meat demand is likely to be much less than -1.0 . For example, if the price elasticity of sheep meat demand is -0.5 , an increase in sheep meat exports of 1.5% is likely to reduce world sheep meat prices by 0.75% (Figure 1).

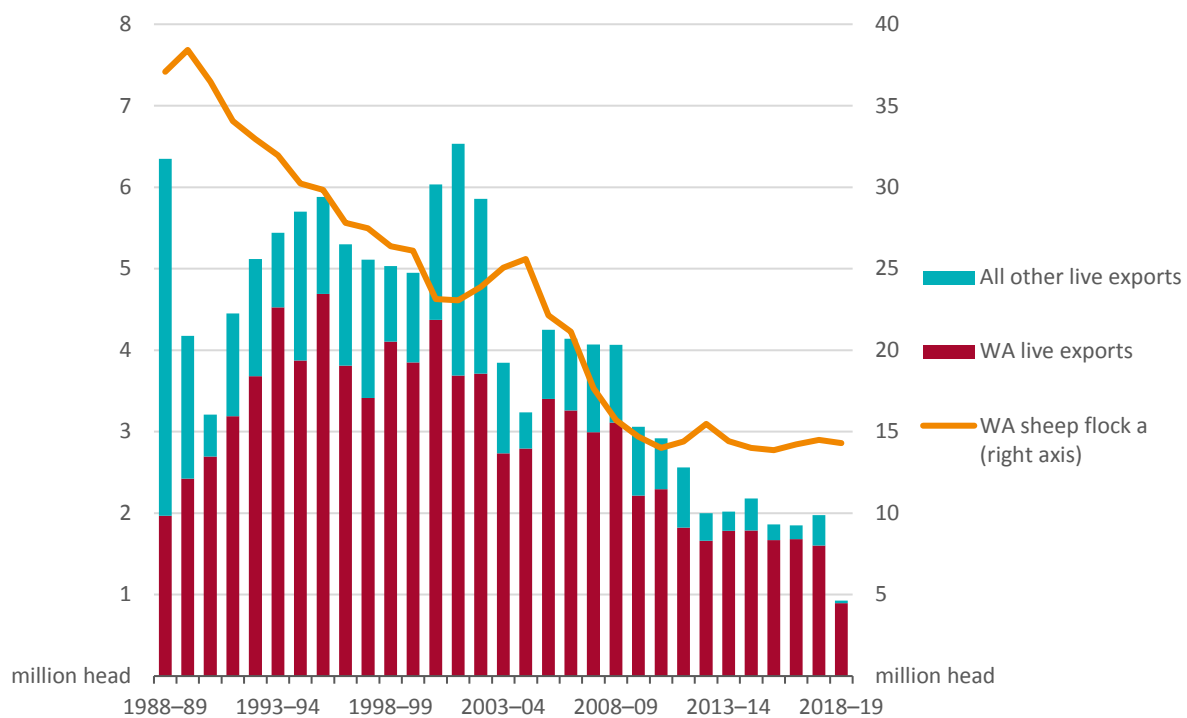
Figure 1 Impact of increased Australian production on world sheep meat markets



Note: 'S' is supply, 'D' is demand, 'P' is price and 'Q' is the quantity traded.

Second, and much more significantly, diverting sheep from live exports to domestic processing is likely to depress saleyard prices in Western Australia during the period that meat processors are recommissioning underutilised processing capacity. Meat-processing capacity in Western Australia is significantly underutilised as a result of declining flock numbers and sheep slaughter. A long-term trend towards crop production reduced Western Australia's sheep numbers from around 38.4 million in 1989–90 to just under 14 million from 2010–11 onwards (Figure 2). This reduction in sheep numbers occurred before restrictions were placed on live sheep exports. Annual slaughter fell by 22%, from an average of 4.6 million head per year between 2000 and 2009 to 3.6 million head per year between 2010 and 2018. This reduction in the WA sheep flock means that saleyards and meat-processing facilities are operating well below their past capacity.

Figure 2 Australian live sheep exports and WA sheep flock, 1988–89 to 2018–19

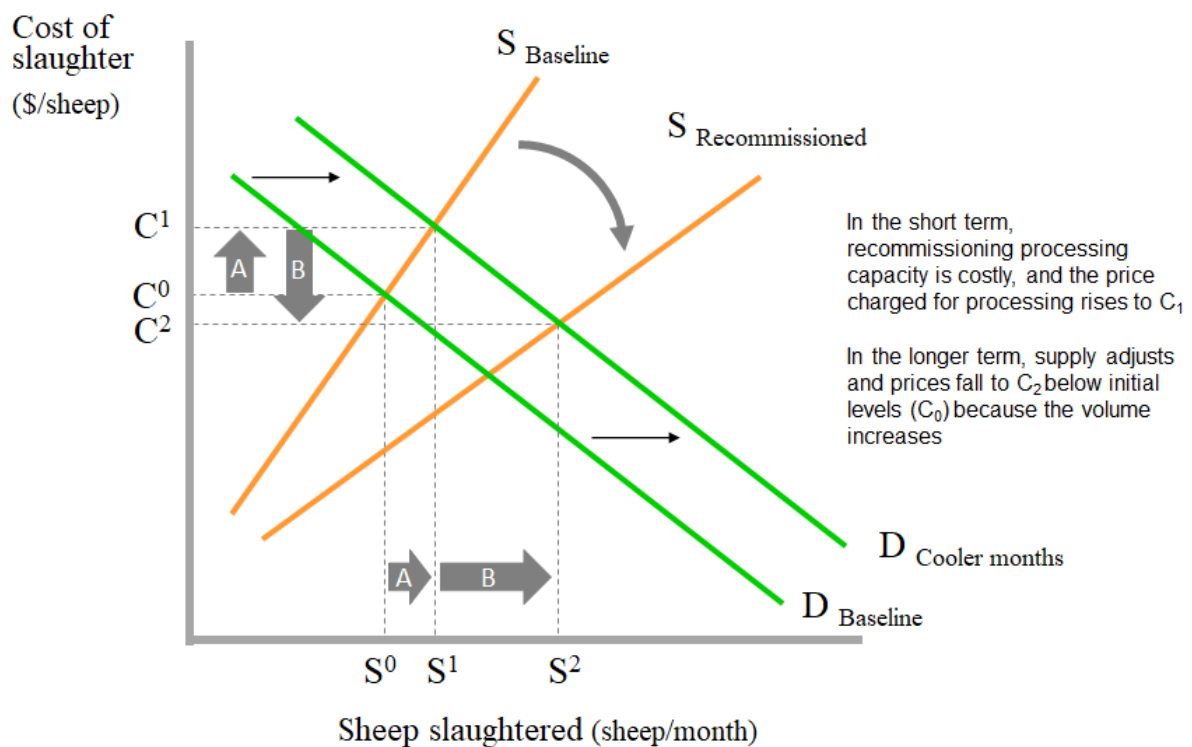


Sources: Australian Bureau of Statistics; ABARES

Diverting live exports to domestic processing would reduce the price of livestock to processors, while the limited potential for world meat prices to fall would provide them with a strong economic incentive to increase slaughter. This is likely to increase the demand for meat-processing services (Figure 3). However, for at least the first few months following a sudden restriction in live exports – and possibly longer – the cost of recommissioning underutilised processing capacity is likely to increase processing costs (to C^1 in Figure 3). Significant investment in new processing facilities is unlikely to be needed, but some investment may be required to recommission facilities that have fallen into disuse. These additional costs are likely to include recruiting and training new staff, leasing temporary equipment and refrigeration, and refurbishing buildings and machinery.

The cost of processing should fall once these initial investments have been made (Figure 3). Economies of scale mean that the final cost of processing (C^2 in Figure 3) is likely to be below the original cost (C^0) because the volume being processed is likely to increase.

The duration of high processing costs is uncertain – it depends on how quickly underutilised processing capacity can be brought back into production. Meat processing is a flexible industry that operates seasonally and routinely adapts to fluctuations in demand. The industry would also be expanding within past production capacity and would be able to draw on previous experience and expertise.

Figure 3 The market for meat processing in Western Australia

Processors have little scope to pass the short-term costs of recommissioning infrastructure on to consumers in world sheep meat markets. This is because consumers can substitute to alternative sources of sheep meat and to other sources of protein. A significant proportion of processing adjustment costs are likely to be passed back to sheep farmers in the form of lower prices for sheep and lambs.

The share of recommissioning costs that meat processors can charge back to farmers in Western Australia – and hence the amount that saleyard prices can fall – is limited, because farmers have the option to transport sheep and lambs to Australia’s eastern states for processing. In practice, this means that processors can only raise processing charges to about \$20 per head – the average cost of transporting sheep to the eastern states for processing. This is just under 20% of the average pre-restriction (2017–18) saleyard prices of wethers sold for live export.

It is difficult to predict the final impact on saleyard prices once processing costs adjust. Lower processing costs due to greater volumes could result in small increases in saleyard prices. However, even if saleyard prices did increase, the profitability of sheep farming is likely to fall slightly due to the additional costs of finishing lambs for domestic slaughter.

2.3 Impacts on WA sheep farms

ABARES farm survey data can be used to estimate the impact on farm incomes of switching from live exports to increased lamb production if the trade in live exports was restricted. To create a plausible scenario, the number of sheep for live export was assumed to halve if trade was restricted to the cooler months in the northern hemisphere. This scenario assumes a sudden disruption to trade. This is a worst-case scenario that increases the short-term costs of transitioning to expanded lamb production.

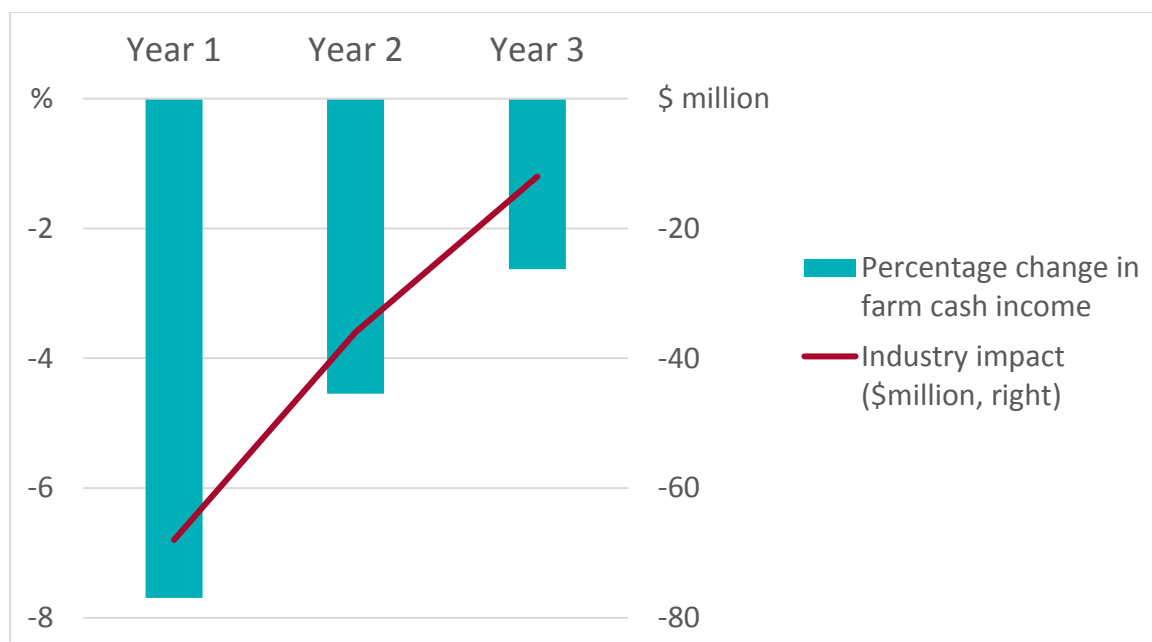
It was assumed that restrictions on live exports were known just before the growing season, and that farmers can divert one-quarter of the sheep intended for live export that year to prime lamb production and 50% in the second and subsequent years of adjustment. Sheep that can't be diverted to lamb production in the first year – assumed to be one-quarter of the sheep intended for live export – are diverted to domestic processing as mutton, which attracts lower saleyard prices.

Farm survey data were used to estimate average receipts and production costs per head of live sheep, prime lambs and adult sheep. Receipts and costs for an average farm were adjusted relative to a base year, according to the number of live sheep, prime lambs and adult sheep sold in each year. The base year reflected average operating conditions for the 5 years ending in 2017 – the last year of unrestricted trade. Producing prime lambs for processing requires more labour and other inputs than producing live sheep for export. This was reflected in higher production costs for prime lambs. All other receipts and costs associated with the production and sale of crops and other livestock were held constant.

The change in farm cash income (total cash receipts minus total cash costs) was estimated for each year relative to the base year. An estimate of the aggregate cost of the scenario was obtained by multiplying the average change in income by the number of farms in Western Australia with more than 100 sheep.

Redirecting sheep from live exports to domestic processing was predicted to reduce farm incomes in the short term as the processing sector adjusts and prices fall (Figure 4). Average farm cash incomes for the 4,420 farms in Western Australia with more than 100 sheep are projected to fall by 7.7% in the first year following a 6-month restriction on live exports, 4.5% in the second year and 2.6% in the third and subsequent years. Across the industry, this translates to a loss of foregone income of \$68 million in the first year, \$36 million in the second year and \$12 million in the third and subsequent years.

Figure 4 Percentage change in average farm cash incomes, farms in Western Australia with more than 100 sheep



Source: ABARES

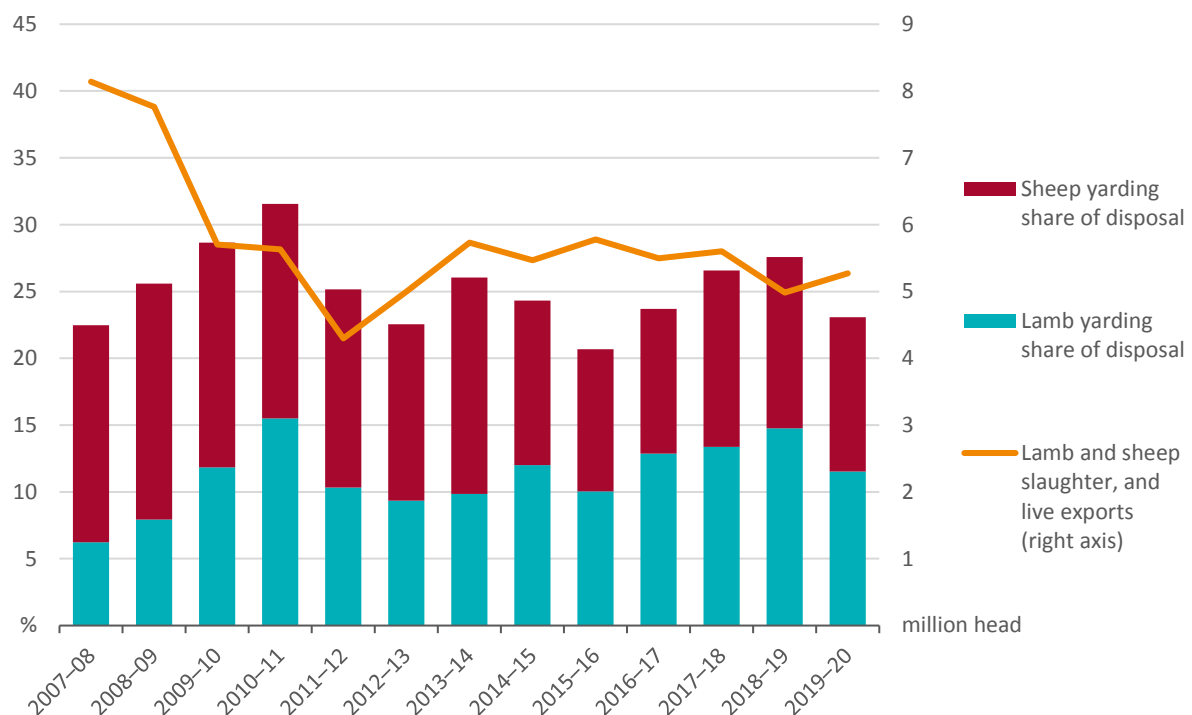
3 Actual economic impacts

3.1 Saleyards

ABARES economic analysis predicted that restrictions on live exports would increase the number of sheep sold and processed domestically.

It is difficult to detect where sheep that can no longer be exported live are being diverted to. This is because most of the sheep sold in Western Australia are sold directly to exporters and processors, with only 20% to 25% sold via saleyards (Figure 5). Sheep destined for live export are mostly sold directly to buyers working for export companies, but sheep sold through saleyards can also be exported live. Farmers selling sheep via saleyards may not know whether they end up on other farms, are exported live or are processed locally. Despite this, some additional increase in saleyard activity is likely.

Figure 5 Share of sheep and lambs sold in saleyards, Western Australia, 2007–08 to 2019–20



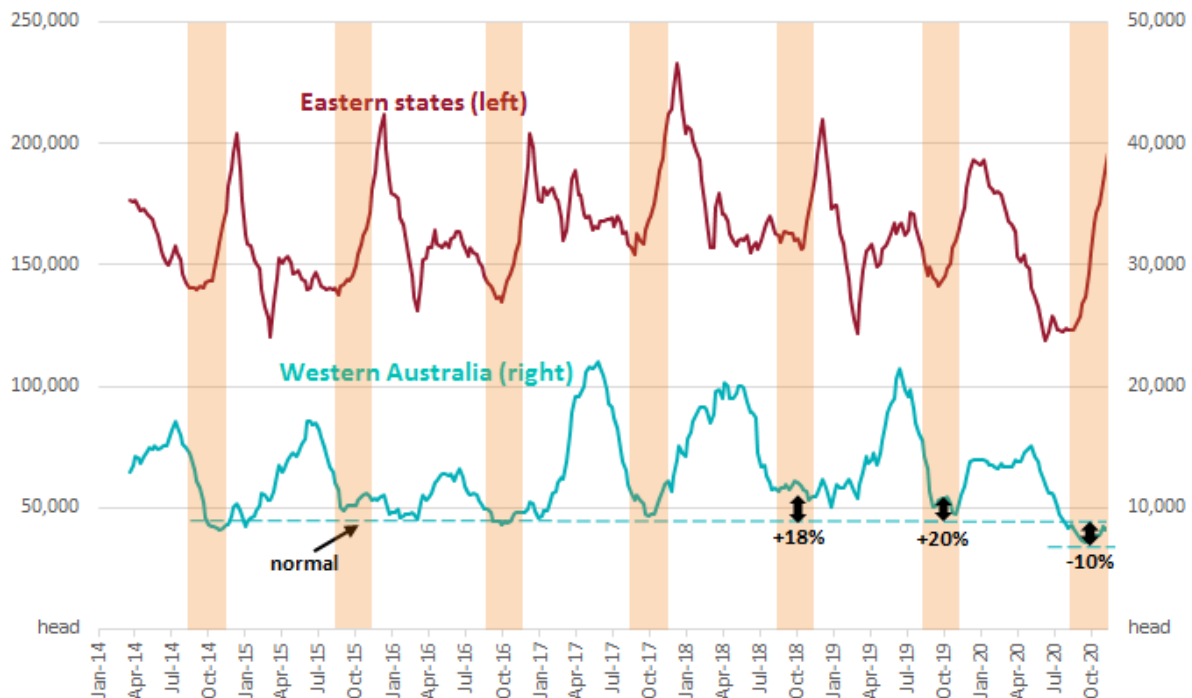
Source: Meat & Livestock Australia (MLA), *Market Information Statistics Database*, Sydney

In 2018 and 2019 the number of lambs and sheep delivered to WA saleyards (yardings) increased after restrictions were imposed on live sheep exports (Figure 6). These increases were most significant in late winter and early spring – especially September and October, when slaughter is usually lowest. In the 5 years prior to the disruption in live exports (2013 to 2017), lamb yardings averaged just under 9,500 per week in Western Australia during spring. The number of lambs delivered to saleyards in spring increased by 18.2% in 2018 and 20.4% in 2019.

In 2020 the number of lambs sold through saleyards fell by 10% in spring as poor seasonal conditions earlier in the year reduced joinings and led to destocking of breeding flocks. Around

1.5 million sheep were transported from Western Australia to the eastern states where favourable seasonal conditions motivated restocking following prolonged drought. The same factors would have reduced the number of lambs available for live export, reducing the impacts of restrictions on trade.

Figure 6 Number of lambs sold through saleyards (12 week moving average), January 2014 to November 2020.



Note: Highlighted areas are September to November each year.
Source: ABARES analysis of data from Meat & Livestock Australia

3.2 Slaughter

ABARES economic analysis predicted that most sheep redirected from live export will be finished to prime lamb standard for domestic processing. If lambs are finished on farm to a higher standard for domestic processing, they are likely to be sent to slaughter sometime in spring after the period they are normally sold for live export.

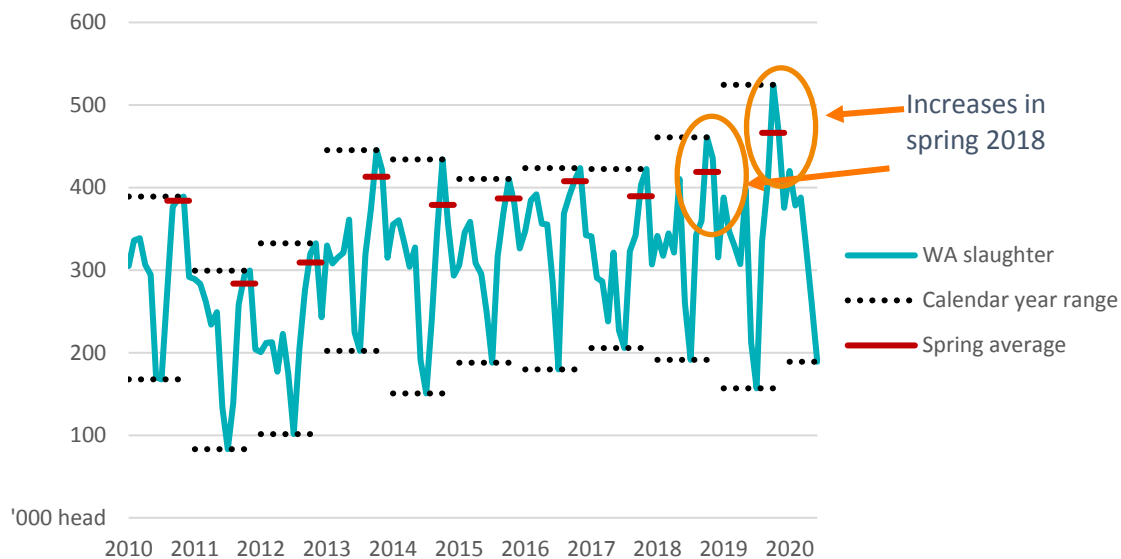
In 2018 WA lamb and sheep slaughter increased slightly after restrictions were imposed on live sheep exports. However, these increases were small relative to the seasonal variability in slaughter rates (Figure 7). In 2018 lamb and sheep slaughter in Western Australia was 12% higher between May and August than the average for these months over the 5 years 2013 to 2017. For the peak processing months of September and November, lamb and sheep slaughter in 2018 was 6% higher than the average over the 5 years 2013 and 2017. Lamb slaughter was 11% higher between May and August 2018, and 13% higher between September and November.

In 2019 total sheep slaughter in Western Australia was within 0.5% of the average for May through to August of the 5 years 2013 to 2017. Lamb slaughter was 8% lower than the 2013 to 2017 average for May to August 2019, due mainly to restocking intentions earlier in the season. For the peak processing months between September and November 2019 slaughter was 18%

higher than the average between 2013 and 2017. From September to November 2019 lamb slaughter was 7% higher than the average from 2013 to 2017.

This data series was converted from monthly to quarterly from July 2020 onwards, so this analysis cannot be updated for spring 2020.

Figure 7 Western Australia lamb and sheep slaughter, January 2010 to May 2020



Note: Monthly data discontinued in June 2020.

Source: ABARES analysis of data from the Australian Bureau of Statistics *Livestock and Meat, Australia*, cat. no. 7218.0, Canberra

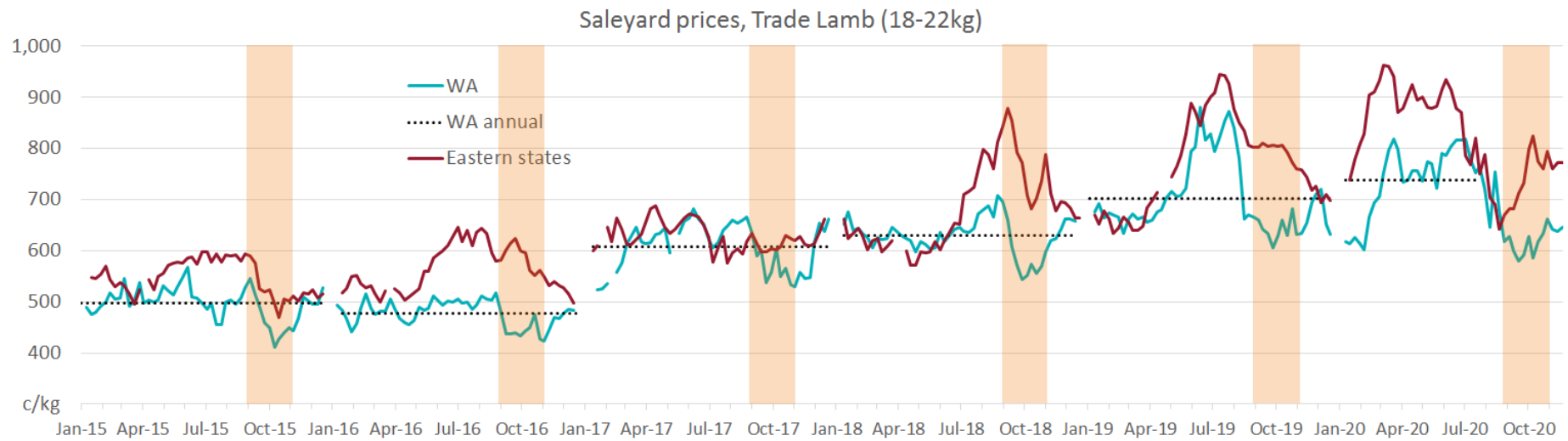
3.3 Prices

Between 2018 and 2019, WA saleyard prices were historically high due to strong global demand for sheep meat, particularly from China (Figure 8). Demand from China eased in 2020, but falling local supply in Western Australia and demand for restocking in the eastern states kept prices high.

WA saleyard lamb prices are usually lower than prices in Australia's eastern states, especially in late winter and early spring. Over the 5 years from 2013 to 2017, WA trade lamb prices averaged 12% lower than eastern states prices in September and October. In 2018 trade lamb prices in Western Australia averaged 28% lower in September and 20% lower in October (Figure 9). WA lamb prices were 21% and 18% lower in September and October 2019. This is consistent with the 20% maximum likely fall in prices predicted by the economic analysis.

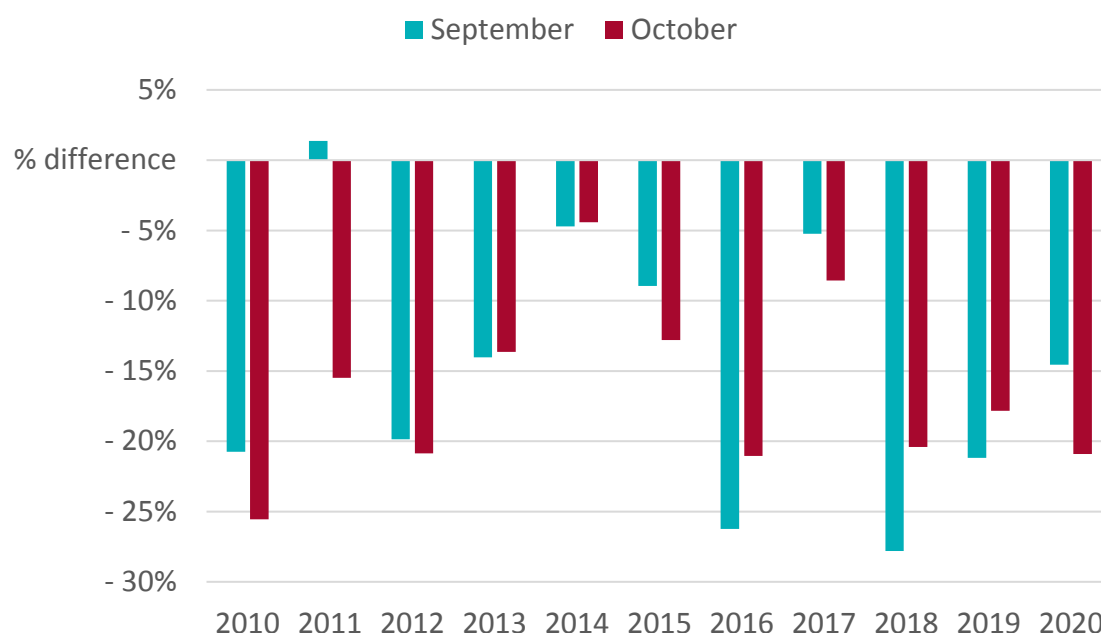
In September and October 2020, saleyard prices of lambs were on average 17% lower in Western Australia than it was in Australia's eastern states. However, any residual effect of live export restrictions on demand and prices was swamped by the effects of seasonal climate conditions on supply and demand. Lamb prices fell due to drought-related destocking and subsequent transport of sheep en masse to Australia's eastern states. Between January and November 2020, nearly 1 million of the 1.8 million sheep transported from Western Australia to the eastern states were lambs (DPIRD 2020). This confirms that the eastern states are an alternative market for WA lambs.

Figure 8 Weekly saleyard prices, trade lamb (18-22kg), January 2015 to July 2020.



Source: Meat & Livestock Australia

Figure 9 Average monthly price difference between trade lamb (18-22kg) prices in the Eastern States and Western Australia, 2010 to 2019.



Note: A negative percentage difference here indicates that WA trade lamb prices were lower than in the eastern states.

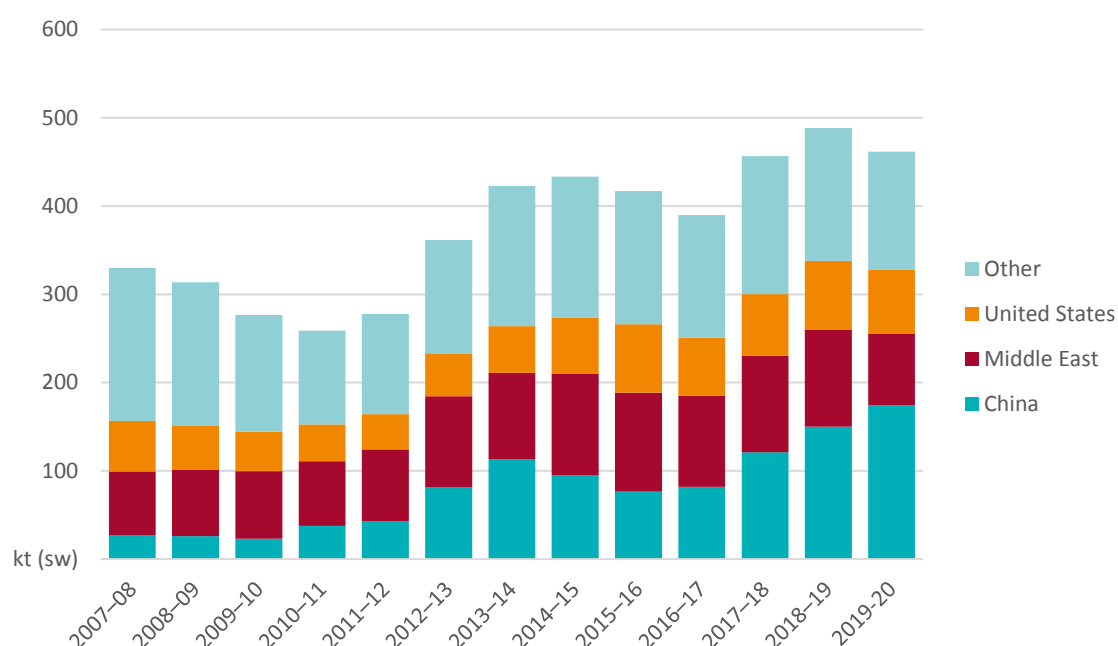
Source: Meat & Livestock Australia

3.4 Exports of sheep meat

Economic analysis predicted that restricting live exports was likely to result in a small increase in sheep meat exports. However, this predicted rise in exports is likely to be difficult to detect relative to other market fluctuations.

Australia's lamb exports surged in 2018 and 2019 mainly due to strong demand in China. This demand was driven by rising incomes, changes in consumer preferences and substitution away from pig meat due to African swine fever (Figure 10). This increase in demand has more than offset any downward pressure on world lamb prices that may have resulted from a small increase in Australia's supply of sheep meat to world markets. A small decline in exports forecast for 2019–20 is mainly due to the negative demand effects of the COVID-19 pandemic, including falling incomes and shutdowns in the food services sector.

Figure 10 Australian sheep meat exports by destination, 2007–08 to 2019–20

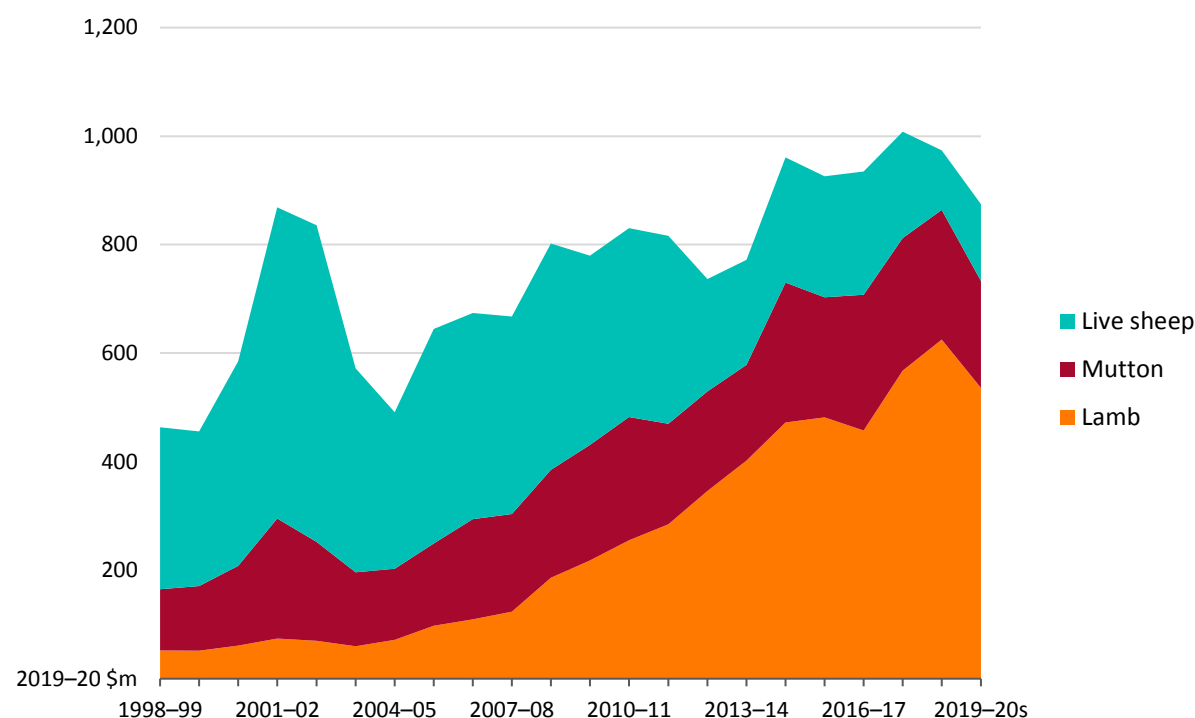


Note: Middle East includes Bahrain, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, Syria, United Arab Emirates and Yemen. sw is shipped weight of processed meat, in thousands of tonnes.

Source: ABS

The economic analysis raises a question about whether restrictions on live exports have reduced the overall value of Australia's sheep meat exports. The value of live exports grew by 4.7% in real terms in the 10 years to 2017–18 (Figure 11). An increase in the value of lamb exports in 2018–19 was not sufficient to offset falls in the exports of mutton and live sheep. The demand effects of the COVID-19 pandemic are forecast to result in a fall in the value of all export categories in 2019–20.

The rising value of lamb exports has resulted in a steady fall in the contribution of live sheep to the value of Australia's sheep meat exports over the last 2 decades (Figure 11). Live exports contributed just under 65% of the average value of sheep meat exports in the 5 years to 2004–05. This fell to an average of 54% for the 5 years to 2009–10, 32% for the 5 years to 2014–15 and 19% for the 5 years to 2019–20.

Figure 11 Value of Australian sheep meat and live sheep exports to the Middle East, 1998–99 to 2019–20

Source: Australian Bureau of Statistics, *International Trade, Australia*, cat. no. 5465.0, Canberra

3.5 Impacts on WA sheep farms

The economic analysis predicts that farm incomes are likely to fall slightly as farmers substitute to less profitable markets. The incomes of sheep farms in Western Australia rose in 2018–19 but were projected to fall in 2019–20 – in both cases due to factors other than changes in live sheep exports.

In 2018–19 there were an estimated 4,420 farms in Western Australia with at least 100 sheep. Around 62% were located in the Central and South Wheat Belt, 23% in the North and East Wheat Belt, and the remaining 15% in the South West Coastal region. Over the 3 years to 2019–20, receipts from sheep and wool accounted for an average 33% of total cash receipts for WA sheep farms, with crop receipts accounting for 58% and other sources 9%. Around 46% of all sheep farms earned at least 50% of their receipts from sheep and wool. The majority of these specialist sheep farms were in the Central and Southern Wheat Belt (66%).

3.5.1 Financial performance

On average, incomes for sheep farms in Western Australia rose over the past decade due to higher prices for grain, sheep, lambs and wool, and increased crop production following a run of good seasons (Figure 12). High grain prices and a large winter crop in 2018–19 contributed to a peak in average farm cash income, following an upward trend since 2015–16. Higher wool and sheep prices in 2018–19 also contributed to the increase in farm cash income in that year.

In 2019–20 average farm cash income is projected to have declined by 48% because of significantly lower crop receipts as a result of poor seasonal conditions (Table 1 and Figure 12). Sheep receipts were steady, mainly due to continued high prices, but wool receipts are expected

to have declined due to lower wool prices. Farm cash income in 2019–20 is projected to be 20% below the 10-year average to 2018–19 in real terms.

Table 1 Financial performance, sheep farms, Western Australia, average per farm 2017–18 to 2019–20

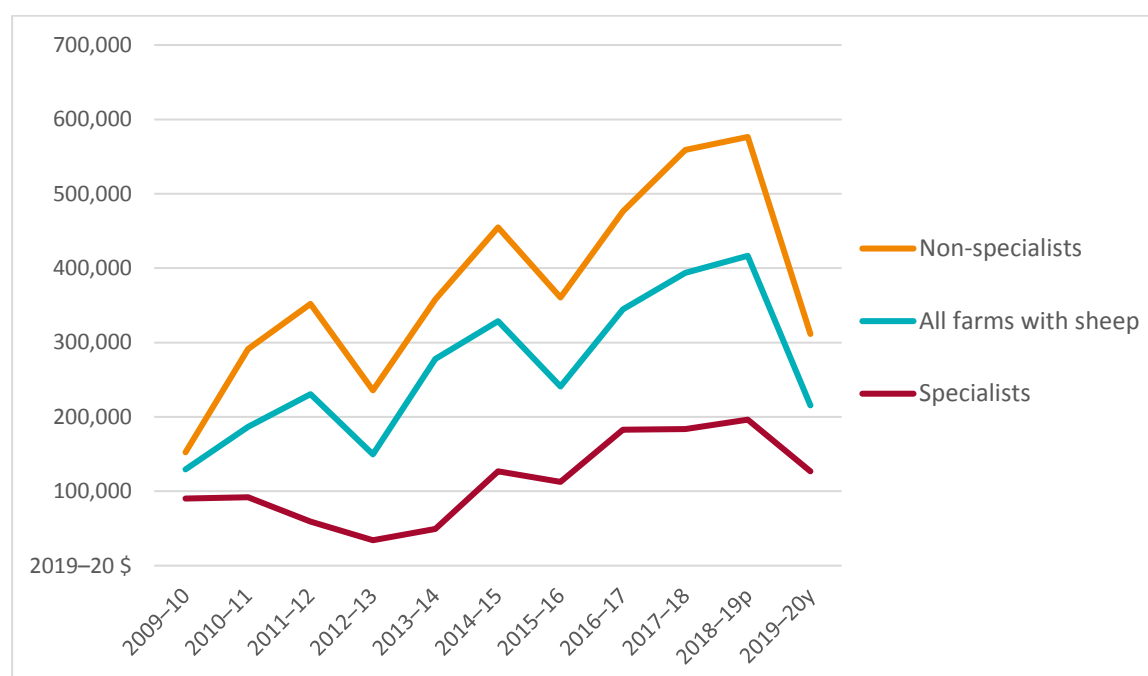
| Farm type | Category | Unit | 2017–18 | 2018–19p | RSE | 2019–20y |
|------------------------|-------------------------|------|---------|-----------|------|----------|
| All farms with sheep | Total cash receipts | \$ | 978,520 | 1,018,200 | (7) | 749,000 |
| | Total cash costs | \$ | 584,810 | 601,500 | (7) | 534,000 |
| | Farm cash income | \$ | 393,710 | 416,600 | (9) | 215,000 |
| | Farm business profit | \$ | 236,210 | 258,500 | (18) | –18,000 |
| | Profit at full equity | \$ | 286,450 | 311,200 | (15) | 26,000 |
| | Rate of return a | % | 5.1 | 5.3 | (13) | 0.5 |
| Specialist sheep farms | Total cash receipts | \$ | 514,960 | 503,900 | (13) | 402,100 |
| | Total cash costs | \$ | 331,310 | 307,600 | (12) | 275,100 |
| | Farm cash income | \$ | 183,650 | 196,300 | (20) | 127,000 |
| | Farm business profit | \$ | 67,410 | 82,800 | (40) | –14,400 |
| | Profit at full equity | \$ | 92,300 | 100,600 | (31) | 1,100 |
| | Rate of return a | % | 2.3 | 2.4 | (24) | 0.03 |

p Preliminary estimate. **y** Provisional estimate. **a** Excluding capital appreciation. **RSE** Relative standard error.

Note: Specialist sheep farms are defined as having more than 50% of receipts from sheep and wool.

Source: ABARES Australian Agricultural and Grazing Industries Survey

Figure 12 Farm cash income, average per sheep farm, Western Australia, 2009–10 to 2019–20



p Preliminary estimate. **y** Provisional estimate.

Note: Specialist sheep farms are defined as having more than 50% of receipts from sheep/wool and non-specialist sheep farms as having less than 50%.

Source: ABARES Australian Agricultural and Grazing Industries Survey

The rise in average incomes over the decade to 2018–19 and the projected fall in 2019–20 were less for specialist sheep farms. Farm cash income is projected to have declined by 35% in 2019–20 to average \$127,000 for specialist sheep farms. The largest contributing factor to this decline is expected to be reduced wool receipts, mainly due to lower prices. Sheep and lamb receipts remained relatively steady, despite smaller average flock sizes and fewer sales due to high prices.

4 Other studies

A number of studies have used various data and models to analyse the economic impacts of restricting live sheep exports, with most studies focusing on an outright ban of the trade. These studies typically fall into one of 2 categories depending on the source of funding for the analysis. Modelling studies funded by animal welfare organisations tend to conclude that the economic impacts of banning live sheep exports would be relatively small because farmers and meat processors can readily adjust to alternative markets. Studies funded by industry organisations tend to assume that farmers have few viable alternatives to live exports, and that a ban would have a significant and persistent impact on prices and farm incomes.

ABARES analysis suggests a noticeable initial impact followed by a smooth and relatively low-cost transition to alternative markets. In terms of suggested magnitudes, ABARES estimates of industry impact are similar to industry-funded estimates in the short term and animal-welfare funded estimates in the longer term. ABARES does not necessarily agree with assumptions or methods used in either of these types of analysis.

4.1 Studies funded by animal welfare groups

Studies funded by animal welfare groups tend to assume that live export markets are unimportant and overlook the costs involved in transitioning to new markets. For example, a recent study for Animals Australia by Davey and Fisher (2020) estimated the premium paid by the live export trade over the price paid by domestic saleyards to be around \$4 per head. Applied to current export volumes of 1 million sheep per year, they estimated the cost of banning live exports to be around \$4 million.

This is likely to underestimate the impact on the industry for 2 reasons. First, there is normally no domestic market for this volume of low-quality young wethers because consumers prefer higher quality meat. Western Australia's short and unreliable growing season means that bringing these sheep to prime lamb standard for domestic processing is likely to require some purchased feed. Preliminary estimates derived from ABARES farm survey data suggest that the cost of redirecting sheep to domestic markets are likely to add between 4% and 13% to the average annual operating costs of sheep farms in Western Australia.

Redirecting this volume of sheep to domestic markets is also likely to cause short-term adjustment in the meat-processing sector. A long-term decline in the Australian sheep industry has meant a gradual decommissioning of processing facilities. These facilities can be recommissioned within a few months but doing so is likely to involve some costs that will be passed back onto farmers as lower saleyard prices. This short-term fall in saleyard prices is limited by the cost to farmers of trucking sheep to eastern state markets – around \$20 per head.

Davey and Fisher (2018) concluded that phasing out live exports would mean that WA sheep farmers would collectively lose around \$9 million. The study estimated that the cash receipts of specialist sheep farms would fall by 0.5% and those of mixed sheep-cropping farms would fall by 0.17%. Losses to sheep farmers would be offset by an additional 350 jobs and an additional \$18 million of value added in the meat-processing sector.

ACIL Tasman (2009a) conducted a study into the economic impact of banning live sheep exports for the World Society for the Protection of Animals. The study found that there would be no sustained impact on sheep and lamb prices if live exports were phased out over a 5-year period. ACIL Tasman estimated that banning live exports would reduce the value of the average sheep flock in Western Australia by around \$11,000, and the value of the sheep industry in Western Australia by \$74.5 million (at 2006–07 flock levels).

In a related study for the RSPCA, ACIL Tasman (2009b) found that potential adjustments by WA sheep farms 'do not appear to be extensive compared to other structural adjustments already underway in the industry' (p. iv). This study found that the option of selling live sheep for export was worth between \$2 per head and \$6 per head depending on the degree to which each farm's sheep flock was oriented toward wool or meat production.

4.2 Studies funded by industry groups

In contrast, studies funded by industry tend to assume that farmers have few viable alternatives to live exports and that restricting live exports would have significant impacts on prices and farm incomes. Industry studies generally assume that foregone exports are a permanent and complete loss to the industry and that short-term impacts on saleyard prices are permanent. These studies tend not to recognise that prices are set in world markets, or that short-term price falls in Western Australia are limited to \$20 per head by the cost of trucking sheep to eastern state markets.

There is also little or no recognition of the potential for saleyard prices to rise once recommissioning has expanded domestic meat-processing capacity and processing costs fall. None of these studies attempts to value the benefits to industry of continued market access and sustained social licence to operate that arise from improved animal welfare outcomes.

The most recent study by Mecardo (Dalglish et al. 2020) estimated the cost of disrupting the live sheep trade to be \$84 million in 2018 and \$66 million in 2019. The value-chain analysis in the report suggests these impacts are likely to be permanent. This estimate of industry impact was derived by estimating the value of foregone exports and subtracting the revenue foregone by selling these sheep at lower saleyard prices.

However, the study is likely to overstate the impact of restricting live exports for 2 reasons. First, a 30% to 50% reduction in saleyard prices was assumed based on the Centre for International Economics (CIE) (2018), despite a footnote recognising that saleyard prices were observed to fall by only 15% to 30%. Second, there is no recognition of the likely short-term nature of these price impacts or the likelihood that prices will rise as an expansion of domestic meat processing reduces processing costs.

Mecardo (2018) estimated that if sheep currently exported live were slaughtered in Western Australia, sheep and lamb prices in Western Australia could fall by between 18% and 35%. This was projected to reduce farmers' revenues by between \$80 million and \$150 million. Mecardo appear to have reached these results by assuming that sheep slaughter in Western Australia determines the state's export prices of mutton and lamb, rather than prices being determined in world markets. There was no recognition of the option for WA farmers to transport sheep to high-value markets in eastern Australia.

Three earlier industry studies were based on the Global Meat Industry Model developed by the CIE. Hassall & Associates conducted the first study in 2006 and updated it in 2011 and 2013. The study by Hassall & Associates (2006) for Meat & Livestock Australia and LiveCorp estimated that banning live exports would cause sheep prices to fall by around 17 cents per kilogram and lamb prices by 7 cents per kilogram. The aggregate effect of a ban was to reduce the gross value of the Australian sheep meat industry by \$219 million.

In a report for Meat & Livestock Australia, the CIE (2011) estimated that the farmgate price of older sheep would fall by 14.6 cents per kilogram if live exports were banned and the price of lambs would fall by 12.2 cents per kilogram. This was estimated to reduce the gross value of production of the sheep meat industry by around \$119 million.

There was a 46% difference between the predicted impact on the value of the sheep meat industry predicted by Hassall & Associates (2006) and the CIE (2011). The CIE authors attribute the predicted lesser impact to improved modelling and more conservative assumptions about the number of livestock that would be transported for processing in eastern Australia. Structural changes reduced the importance of live exports to the industry between the 2 studies.

In a later report for Australian Wool Innovation, the CIE (2013) estimated that the average saleyard prices of older sheep in Australia would fall by \$13.30 per head (24.4%) and lamb prices by \$4.07 per head if live exports were banned. This was projected to reduce the gross value of the sheep industry by 10.3%.

5 Conclusions

Changes to regulation and other disruptions to live sheep exports have had some impact on WA sheep meat markets, and the WA sheep industry. There is some evidence that sheep have been diverted from live exports to domestic markets for meat processing and restocking.

The initial effects of these disruptions have included winter and early spring saleyard prices 10% to 20% lower than they would have been without restrictions on live exports. Short-term falls in saleyard prices have been effectively limited to around 20% by the option of transporting sheep to eastern state markets. Saleyard prices have been lower than they would have been without disruptions to live exports, but strong global demand for sheep meat has driven saleyard prices to historically high levels.

Prior to the demand-limiting effects of the COVID-19 pandemic, high saleyard prices increased average farm incomes to historically high levels – offsetting the potential fall in farm incomes that may have otherwise arisen from restrictions on live exports. ABARES analysis indicates that the magnitude of these impacts is likely to lie between those predicted in studies funded by industry and by animal welfare groups. Relatively high short-term costs are likely to decline as meat processing costs adjust, illustrating the flexibility and adaptability of the WA sheep and meat processing industries.

6 References

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