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## Beyond the Dock: Strategies for Sustaining the Western Australian Sheep Industry in a Changing Export Landscape

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### Abstract

In this paper the characteristics and structure of Western Australia's (WA) sheep industry value chain are examined, and key risks and opportunities are identified. The sheep industry remains a cornerstone of the WA agricultural sector, with the state being the only one that still relies heavily on live sheep exports to access international markets and manage stock effectively. However, the phase-out of live sheep exports in WA poses significant risks to the sheep industry, particularly in terms of market, price, and processing risks. In this report, alternative risk management strategies are explored such as forward contracts to mitigate market volatility. The importance of value chain integration and network design to address inefficiencies and chain failure is highlighted. Additionally, the role of feedlots and improved processing capacity is discussed as mechanisms to alleviate the pressure on facilities. Government support through grants and loans, combined with private investment, is suggested to enhance the capacity and efficiency of the WA sheep supply chain, ensuring long-term sustainability and resilience in the face of this transition.

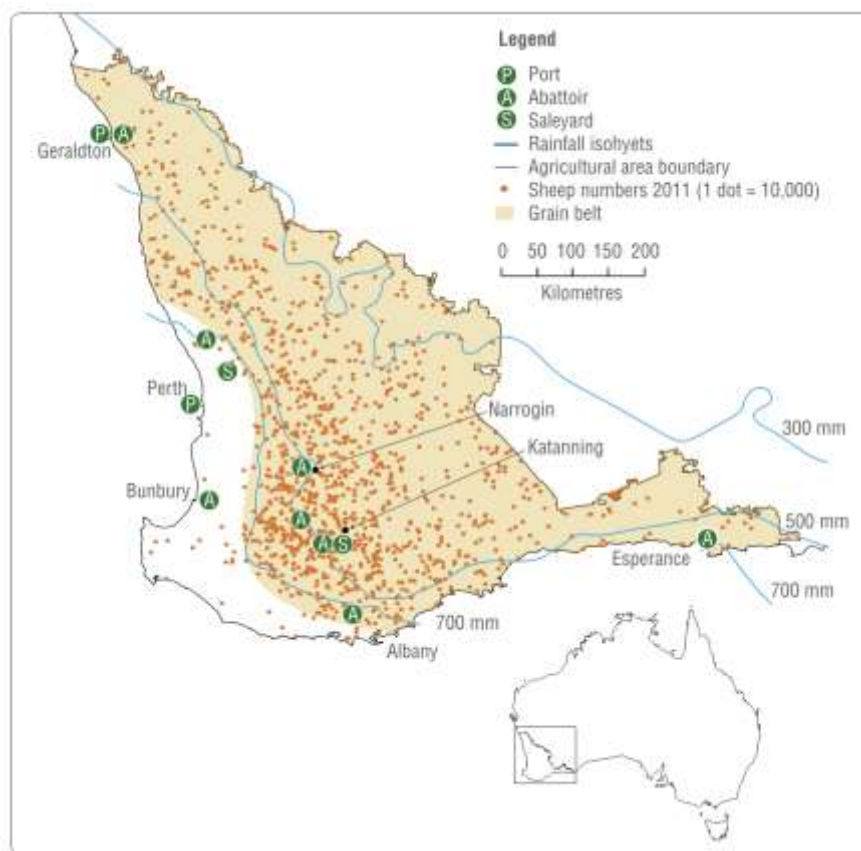
**Keywords:** Sheep, Western Australia, Value Chain, Live Export, Lamb

### Background

The sheep industry has always been an integral part of Australian agriculture and is the foundation for many rural communities. Australia's prosperity was said to 'ride on the sheep's back', as it was the first major exporting industry and led to an economic boost (Glyde et al., 2023). For the most part, the industry structure has changed to accommodate fewer producers with larger flocks and farm sizes. In 2023, Australia's sheep flock was 78.75 million head, of which 46.14 million head were breeding ewes (MLA, 2023a). In 2022-23, Australian sheep exports accounted for 10 per cent of the \$7.98 billion total value of agricultural exports in the form of wool, sheep meat and live sheep (Glyde et al., 2023).

Western Australia (WA) supports a sheep flock of 12.4 million head (ABS,2023a). ABS (2023a) estimates that of the 8,233 agricultural businesses in WA, more than half, 4,281, support a sheep flock. Of this over 50 per cent are specialist sheep farms, and do not operate mixed enterprises (Glyde et al., 2023). Sheep in WA are concentrated in the southwest of the state, with 80 per cent contained in the Wheatbelt, Southwest and Great Southern regions (Glyde et al., 2023) (see Figure 1). The state's flock comprises 80 per cent Merino sheep, with the remainder being meat-specific breeds such as Dorper (Glyde et al., 2023). The flock has evolved to have more lambs and fewer wethers, in response to the growing demand for sheep meat (Glyde et al., 2023).

**Figure 1. The distribution of the sheep industry across Western Australia (including locations of sale yards, ports, and abattoirs licensed to export)**



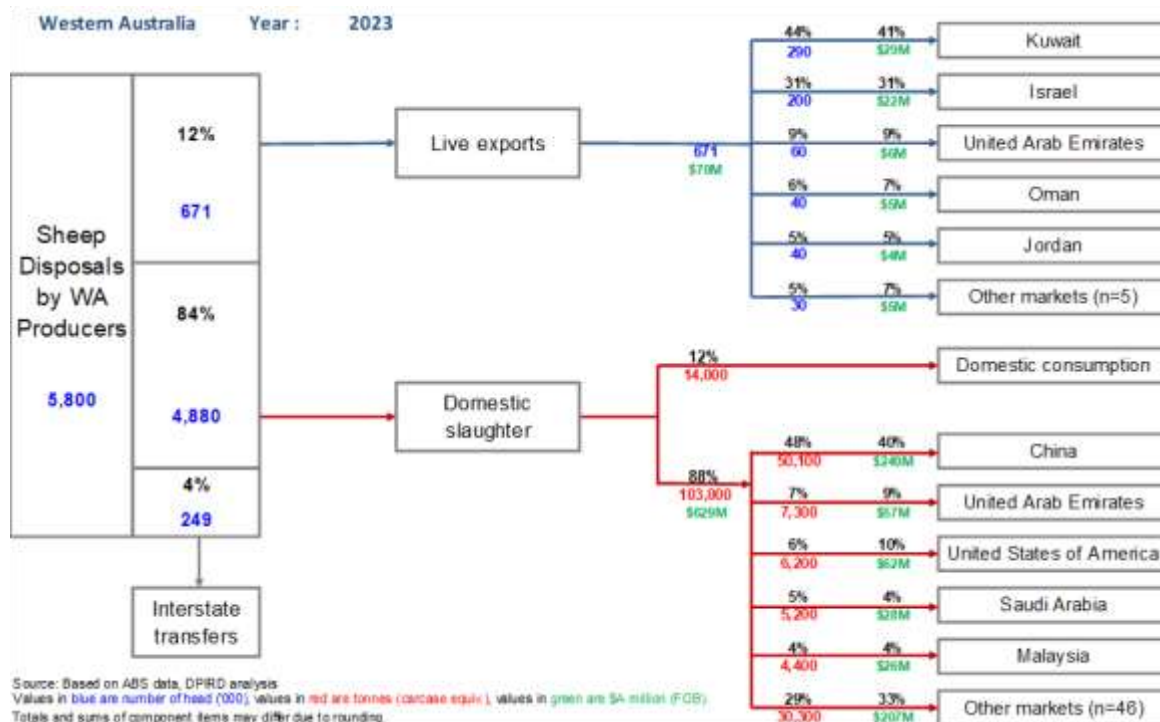
Source: Star et al. (2021)

In WA in 2022/23, lamb slaughter was the largest component of sheep turn-off, comprising 50 per cent or 2.8 million head (Pritchett, 2024). Adult sheep slaughter accounted for 30 per cent (1.7 million head) and is more seasonally dependent, helping producers manage feed and water resources (Pritchett, 2024). Live sheep export made up 12 per cent (664,000 head), while interstate transfers, driven by price differences and dry conditions, accounted for the remaining 8 per cent (460,000 head) (Pritchett, 2024). The eastward movement of sheep has increased in 2023/24.

Live sheep exports play a crucial role in WA sheep producers' strategies to mitigate the risks associated with a short spring growing season (ACIL Allen, 2023). The brief growing period can prevent lambs from reaching the desired weight or quality for the prime lamb market before hot summer conditions limit pasture growth, making supplementary feeding necessary (ACIL Allen, 2023). This challenge is particularly acute during droughts, where live exports provide an essential outlet for managing livestock under these conditions (ACIL Allen, 2023).

The major market for live exports is the Middle East, whereas the major processed export market is China. The movement of sheep disposals in 2023, and the value of these markets, is highlighted in Figure 2. Most WA sheep disposals are for domestic slaughter, with the meat intended for local consumption or exported as chilled or frozen product (Pritchett, 2024). In WA there are now nine export-registered ovine (sheep) processing establishments, all located in the main sheep producing areas in south-west WA (Glyde et al., 2023). Local processing is busiest during spring when both sheep and lamb slaughter numbers rise. Three independent boning rooms do not perform slaughter but take carcasses for further processing (Glyde et al., 2023).

**Figure 2. The percentage breakdown, in number of head (thousands), tonnage (carcass equivalent), and value (A\$ million), of sheep disposals in WA for live export, domestic slaughter, or interstate transfers, 2023**



Source: Pritchett (2024)

The phase-out of live sheep exports by sea in Western Australia marks a pivotal moment in the region's agricultural history. Live sheep exports have been a cornerstone of WA's sheep industry for decades, providing farmers with access to international markets, particularly in the Middle East, where demand for live animals remains high due to cultural and logistical preferences. However, the trade has been contentious, with concerns over animal welfare being the focus of public scrutiny and government reviews since 1985 (Sinclair et al., 2018). High-profile incidents of animal mistreatment during transportation and at destination markets have intensified public concern and led to calls for change (Sinclair et al., 2018).

The recent decision to phase out live sheep exports is rooted in these animal welfare concerns and reflects growing societal expectation for ethical treatment of animals in agriculture. The policy follows years of advocacy from animal rights groups and shifts in public opinion, leading to government action. The timeline for implementation spans until 2028, offering a transition period for stakeholders to adapt. This phased approach aims to balance the need for reform with the economic realities faced by farmers and industry participants. The Federal Labor Government announced a further \$32.7 million to the transition support package in October 2024, bringing the total overall package for the transition to \$139.7 million (Department of Agriculture, Fisheries and Forestry, 2024).

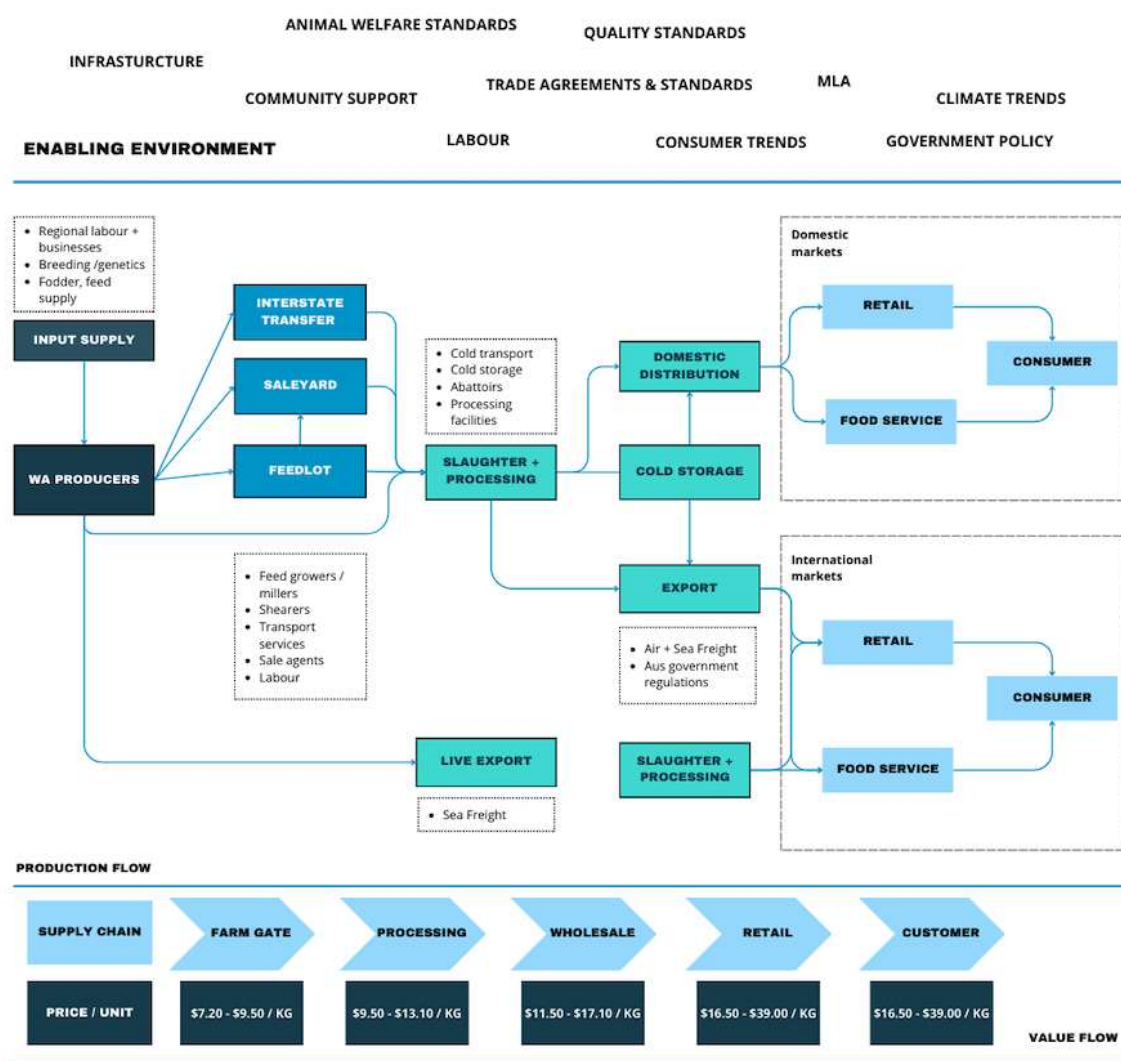
This policy shift has far-reaching implications for the industry. Farmers, who have relied on the trade for their livelihoods, must pivot towards alternatives, including increased domestic processing and developing new markets for sheep meat and wool. However, this phase-out raises challenges, such as concerns about the viability and how risk is managed in businesses, limited domestic processing capacity, and the potential for reduced market competition. These factors could exacerbate financial strain, impact livelihoods, and lead to job losses, particularly in rural and regional communities where the live export trade underpins local economies.

The policy shift towards phasing out live sheep exports highlights the need for the industry to adapt. Conducting a value chain analysis can help identify strengths, weaknesses, opportunities, and risks and assess the industry’s capacity to transition effectively. This evaluation can equip the industry to address challenges proactively, mitigate risks, and leverage emerging opportunities for sustainable growth and resilience.

### The Western Australia Sheep Value Chain

The sheep value chain in Western Australia, shown in Figure 3, is characterised by various stages from input supply to final consumer delivery.

Figure 3. The Western Australian sheep industry value chain, incorporating live sheep exports



Source: Derived from Western Australia Agriculture Authority (2016), Glyde et al., (2023) & Star et al. (2021).

The industry primarily is a network of independent producers, processors, and marketers, rather than a streamlined, vertically integrated system. Unlike the dynamic nature of other agricultural value chains, the sheep industry relies heavily on both regional and external inputs, such as feed, genetics, labour, and processing facilities. A key player in this value chain is the Western Australian Meat Marketing Co-operative (WAMMCO), a producer-owned co-operative that plays a vital role in

processing and marketing sheep meat. WAMMCO acts as a critical link between producers and both domestic and export markets, offering integrated processing facilities such as slaughterhouses, cold storage, and distribution networks. It exemplifies a strategic alliance that combines horizontal collaboration among producers with vertical integration in the supply chain, where members collectively fund WAMMCO to deliver shared benefits through streamlined processing, marketing, and access to premium markets (Malcolm et al., 2017).

The industry is supported by a combination of domestic and export markets, with processing often involving direct ownership and control over slaughterhouses, cold storage, and distribution channels, ensuring consistency and quality. The marketing of sheep products is handled by multiple entities, allowing for a diverse and competitive marketplace. However, this industry is also shaped by external factors such as animal welfare standards, government policies, and climate trends, which collectively influence the efficiency and profitability of the value chain.

## **Expected Effects of the Live Export Ban on the Value Chain**

### **Processing capacity and infrastructure**

The WA sheep industry is highly dependent on the processing stage of the value chain. As sheep producers move away from live export by sea, there will be increased demand for domestic sheep processing capacity. The WA sheep processing value chain will need to accommodate the additional stock (DAFF, 2024). There is a concern from producers who already struggle to access bookings at abattoirs, that the increased competition will make it extremely difficult with the current infrastructure (Glyde et al., 2023). A challenge of the value chain is managing the seasonal variability in sheep processing, as producers seek to balance stock numbers with available feed (Glyde et al., 2023). Slaughter volumes are highest in spring during lamb turn-off and lowest during winter when less feed is available. These fluctuations are challenges for processors to manage capacity and labour. Furthermore, cold storage is a limiting factor for processors to increase production, as the local infrastructure is not available (Glyde et al., 2023). The current network design lacks the flexibility to respond to external market changes and acts as a physical constraint to the value chain (Chopra & Meindl, 2013). Additionally, long delivery distances for products to reach markets and processing provide logistic vulnerability (Taghikhah et al., 2023).

### **Labour**

The inability to gain skilled labour is a major risk to the WA sheep industry value chain. The livestock workforce is shrinking and aging, with the median age of a highly skilled employee being over 55 years (Wu et al., 2019). This is higher than the median age across other agricultural industries (Wu et al., 2019). The transition away from live sheep exports by sea may increase the need for workers along the supply chain to be skilled in different ways (DAFF, 2024). The labour requirements for processor workers as a result of the phase-out is expected to be 3200 full-time equivalent (FTE) workers, compared to the currently employed 1,750 FTE (Dalglish et al., 2023). Securing a skilled workforce is a major challenge for abattoirs, affecting daily processing and overall capacity (Dalglish et al., 2023). Furthermore, the lack of suitable regional worker housing for extra workers is a compounding factor that is inhibiting an increase in labour supply (Glyde et al., 2023). The industry has a heavy reliance on temporary migrant workers, with processors viewing this as necessary to address the workforce challenge (Glyde et al., 2023). Under this design, the average workforce turnover rate in the Australian meat processing industry is 58 per cent. The shift to a more reliable, long-term workforce is required to reduce risk labour shortage risks in events such as COVID.



## **Domestic market**

The WA sheep industry faces unique challenges due to its less vertically coordinated value chain and relative isolation, where sheep meat prices are heavily influenced by fluctuations in supply (Graham et al., 2021). Diverting sheep from live exports to domestic processing is likely to depress sale yard prices in WA during the period that meat processors are recommissioning underutilised processing capacity (Nelson et al., 2021). Without the option of live sheep exports, there is an estimated decline of \$21.84 per wether in WA (ACIL Allen, 2023). This further complicates the value chain, as it may lead to an oversupply in the domestic market if the capacity of processors cannot quickly adjust to handle the increased volume of sheep diverted from export.

This supply-demand model contrasts with the situation in Australia's eastern states, where an increased presence of forward contracts in sheep meat supply chains mitigates risks for both producers and processors, offering more stability and enabling future market predictions (Graham et al., 2021). In addition to these internal market dynamics, interstate transfers of sheep from WA to the eastern states are becoming increasingly relevant. As sheep prices in WA remain lower compared to those in the eastern states, producers are incentivised to transfer livestock eastward. The cost of transportation usually does not exceed the price gap between the two regions, making it economically viable for producers to move sheep across the country.

In April 2024, the west-east transfer proved beneficial – sheep were valued at \$20 per head in the west but fetched \$50 to \$60 per head on the east coast. This resulted in a \$10 per head margin after accounting for transportation to the east and other transactional costs. This has resulted in massive interstate transfers at the start of 2024 (Elders, 2024). This level of interstate transfer has not been witnessed since 2020 when nearly 1 million head (70,000 per month) were moved from WA to the east coast, due to a drought (Elders, 2024). This movement helps farmers offload stock to account for the dry conditions and feed imbalances but also introduces additional logistics and operational considerations for the WA industry.

## **Global market impacts**

The phasing out of live sheep exports may have an impact on global sheep meat prices, but the degree of substitution between live sheep and chilled/frozen meat in select markets will be important. Australia's sheep meat prices are largely set in world markets. If more sheep meat supply from WA is processed then world prices may fall in the short-term as supply increases, while consumption of sheep meat in importing nations is likely to be higher than it would otherwise be, due to a slight fall in price (Nelson et al., 2021). Of the major markets for live sheep exports from Australia, five countries have imported 80 per cent of Australia's live sheep exports historically - Israel, Jordan, Kuwait, Oman, and the United Arab Emirates (ACIL Allen, 2023). Research has found that for these countries, live sheep product imports from other nations will occur rather than substantially increase their imports of Australian boxed or chilled sheep meat if Australia ceases its live sheep export trade (ACIL Allen, 2023). Despite the practicality of boxed or chilled meats, the cultural, religious, traditional and practical importance of live sheep in the Middle East particularly during religious festivals such as Eid al-Adha outweighs this (ACIL Allen, 2023).

## **Adapting to the Future**

### **Network design**

In addressing the change and risks associated with the phase-out of live sheep exports in Western Australia, value chain network design becomes crucial for ensuring the industry's resilience and

sustainability. The WA sheep industry currently follows a supply/demand model, with limited vertical integration within the industry (Graham et al., 2021). Currently, the industry functions with each stage of the value chain managing products on a commodity basis, where profitability is driven by the volume handled (DPIRD, 2017). Every time the product changes hands, additional costs are incurred, which are ultimately absorbed by either the consumer or the producer (DPIRD, 2017). By integrating the value chain, many of these extra costs can be reduced or eliminated, resulting in cost savings that benefit all parties involved. This integration allows for higher prices to be paid to producers, thereby supporting and encouraging increased production (DPIRD, 2017). Additionally, direct measures to reduce transaction costs for transporting sheep to the Eastern states, such as improving transport infrastructure, streamlining and subsidising logistics, and creating cooperative arrangements for bulk transport, could significantly enhance the efficiency of the value chain while maintaining competitive market access for WA producers.

Under the current organisation, the WA sheep industry will experience chain failure with the live sheep export ban. Chain failure occurs when the chain fails to maximise chain surplus because it supplies a suboptimal level of throughput and value (Griffith et al., 2012). Part of the argument for chain failure may rest with the policy relating to the timeframe of the ban being implemented and not providing enough time for the value chain to plan, adapt and evolve. The Export Control Amendment Bill proposes to ban the export of live sheep by sea from Australia from 1 May 2028 (Zhou, 2024). This provides less than four years for sheep farmers to adjust their production methods to pursue new or diversified operations, a timeline that is widely contested within the sector. However, the impact of chain failure extends beyond farmers. Inefficiencies in logistics, such as limited processing facilities, capacity constraints, and the shortage of trained labour, exacerbate the risk of chain failure (Malcolm et al., 2017). Enhancing information flows will be crucial for coordinating production and processing capacity with market demand. By improving communication and data-sharing among stakeholders, the industry can better forecast demand, optimise scheduling, and avoid overproduction or underutilisation of facilities (Chopra & Meindl, 2016). Coordination between farmers, processors, and logistics providers will ensure that each stage of the supply chain operates efficiently, reducing the likelihood of bottlenecks and helping the industry adapt to the ban.

An example of the industry coordinating and evolving to the live sheep ban could be the development of marketing alternatives which could reduce risks through the value chain and provide other risk management methods for sheep farmers (Barry & Ellinger, 2021). Currently, in WA sheep producers function predominantly on the spot market, with only 1 per cent of sheep sales sold through forward price contracts (Glyde et al., 2023). Spot markets have limited risk management, as prices and supply are volatile and highly seasonal. Different risks are experienced throughout the value chain. Production risk is assumed by the producer, while the processor or live exporter takes on the risk of receiving adequate supply and price fluctuations. Meanwhile, the wholesale, retail, and importing sectors face the risk of price changes to meet customer specifications (DPIRD, 2023).

The development of a forward contract market could offer a valuable tool for sheep producers in WA to manage the production and price risks associated with the phase-out of live sheep exports. Forward contracts generally entail a promise to deliver at a specified future point in time at a predetermined price (Barry & Ellinger, 2021). Forward contracts can help stabilise supply levels, by providing price signals and increasing the level of certainty in value chain margins for both producers and processors. Forward price incentives reflecting the value to processors in producers feeding and carrying lambs on farm or in feedlots to higher weights can help with a more consistent flow of sheep to processors and reduce the volatility that typically accompanies seasonal peaks (DPIRD, 2023). Currently, WA sheep producers underutilise forward contracts, which underscores a potential for processors and producers to collaborate more closely in ensuring a guaranteed and steady supply, ultimately helping producers better plan and manage their stock and income (Glyde et al., 2023). The current forward contracts to

processors are between one and four months (DPIRD, 2023). This offers protection for producers over short-term declines in price, but value for longer-term decision-making is limited (Laurie et al., 2019). Forward contracts are a form of strategic alliance, where two or more firms (e.g. producer and processor) work together to achieve mutually beneficial goals (Malcolm et al., 2017). Forming strategic alliances can help reduce the costs associated with managing risks for producers, processors and marketers (Malcolm et al., 2017). This is achieved through fixed and reliable prices, which allows planning and budgeting (Malcolm et al., 2017). Ensuring supply at a predetermined forward price, giving processors confidence in their throughput, and allowing them to plan their production schedules increasing efficiency (Malcolm et al., 2017). Finally, securing a guaranteed supply at a set forward price gives retailers or exporters confidence in their product availability (Malcolm et al., 2017). The greater use of forward contracts in the sheep industry could decrease price risks and smooth fluctuations in supply for processors to manage capacity and labour.

### **Managing processing risks**

With the phase-out of live sheep exports in WA, the value chain has one fewer pathway for product flow for lamb and sheep from WA farms. Options remaining will be sales to processors in WA, to specialised feedlots in WA, or to markets on the east coast of Australia. It is likely WA small ruminant processing facilities will absorb a greater volume of sheep that would have been previously exported live, which can stretch current capacities, especially during peak seasons (Glyde et al., 2023). Maintaining larger facilities and workforces can help deal with seasonal peaks but may prove costly during periods of low supply, as these fixed costs remain even when facilities are underutilised (Glyde et al., 2023). This mismatch between supply and processing demand could create inefficiencies, increasing overall supply chain costs.

Feedlots may offer a useful mechanism to smooth out supply fluctuations (Glyde et al., 2023). By holding sheep in feedlots during times of low demand or when slaughter facilities are stretched to capacity, the industry can ensure a steady flow of animals through processing plants, avoiding bottlenecks and maximising facility utilisation throughout the year (Glyde et al., 2023). The cost and fluctuations in feed input costs will be important determinants of a feedlot market.

According to Chopra & Meindl (2016) increasing the flexibility or capacity of processing facilities can reduce transportation costs and improve response times by enabling closer proximity to production and reducing transit delays. However, the rising processing costs due to new infrastructure investments are unlikely to be transferred to consumers in global sheep meat markets (Nelson et al., 2021). Consumers can easily switch to alternative sources of protein or other forms of sheep meat, limiting the ability of processors to raise prices (Nelson et al., 2021). As a result, much of the financial burden from these processing adjustments is expected to fall on sheep farmers, who may face lower prices for their sheep and lambs, as shown in Figure 4 (Nelson et al., 2021).

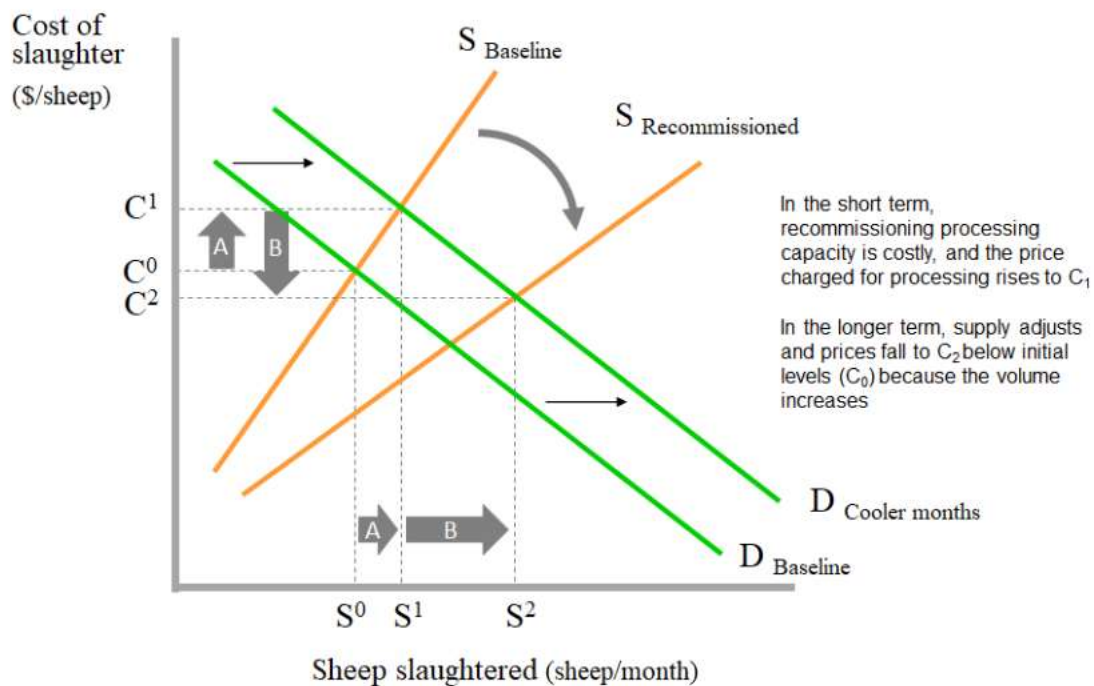
Governments should offer access to financial support such as grants and loans to enhance the capacity and efficiency of the WA sheep supply chain (Glyde et al., 2023). While the need for investment in areas such as processing facilities, feedlots, cold storage, transport infrastructure, and worker accommodation (Glyde et al., 2023) may appear to be a value chain problem, it also has characteristics of a public good issue.

Enhancements in these areas would not only benefit individual businesses but also generate broader economic and social benefits, such as creating jobs, supporting rural communities, and stabilising regional economies reliant on the sheep industry. Additionally, market failures, such as the inability of individual businesses to coordinate large-scale investments or overcome high initial costs, highlight the need for government intervention. Public funding, when paired with private-sector investment,



can address these coordination challenges, reduce systemic risks, and ensure equitable access to improved infrastructure, thus delivering long-term benefits to the entire industry and broader society (Glyde et al., 2023).

**Figure 4. The market for meat processing in Western Australia**



Source: Nelson et al. (2021). Note: The price can only fall to a limited amount because farmers can transport stock to the eastern states for processing, therefore processing costs can only increase to a certain amount.

## Conclusion

The transition away from live sheep exports in Western Australia requires the adoption of robust risk management strategies across the supply chain. Forward contracts can help producers mitigate market risks, while value chain integration and improved communication among stakeholders will enhance efficiency. Increasing processing capacity through infrastructure investments and the strategic use of feedlots can help smooth seasonal fluctuations and alleviate bottlenecks. However, these solutions come with added costs. Government financial support, paired with private-sector investment, is critical to ensuring the sustainability of the WA sheep industry during this period of transition and beyond.

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