



Department of
Agriculture and Food



THE ECONOMIC IMPORTANCE TO WESTERN AUSTRALIA OF LIVE ANIMAL EXPORTS

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Key Points

- WA supplies three-quarters of Australia's exports of live sheep.
- WA supplies 40 percent of Australia's exports of live cattle.
- Economic studies show that the live export trade enhances the value of Australia's red meat industry. Cessation of the trade will cause reductions in beef, lamb and mutton prices received by farmers and pastoralists.
- Economic studies show regional benefits from the live export trade can be large. Hence, regions dependent on the trade, such as WA's northern beef region and the WA southern agricultural sheep region, are likely to be particularly disadvantaged if the live trade ceases. However, meat processors are shown to benefit from the cessation of live exports in the short to medium term through access to more animals at cheaper prices.
- In some regions such as the northern WA pastoral beef industry there are few alternative enterprises or markets that are as lucrative as live export. In some other regions such as WA's southern sheep growing region, alternative enterprises are available. However, some sheep dominant businesses will experience significant transition costs if the live export trade ceases.
- The economy-wide aggregate impacts associated with a cessation of the live trade are relatively minor (in percentage terms), however the regional economy effects in particular regions, such as the northern beef region, would be large.

Executive Summary

For Western Australia (WA) the main live export industries, by economic ranking, are sheep, cattle and goats.

Currently WA annually exports around 2.5 million live sheep, although in previous years it has exported over 4 million sheep. The more than 60 percent decline in the WA sheep population since the early 1990s has reduced the number of sheep available to be exported live. However, due to similarly pronounced reductions in sheep numbers elsewhere in Australia, the live sheep trade remains strongly dependent on WA. WA continues to supply around three-quarters of the national exports of live sheep. Sheep death rates during sea transport from WA have declined since the early 1990s and now remain at approximately 1 percent. Prices paid for exported sheep remain strong, in spite of the appreciation of the Australian dollar.

WA exports around 300,000 live cattle, mostly to Indonesia. This trade grew rapidly in the 1990s and has remained strong over the last decade. It is important to WA's northern region. WA and the Northern Territory are the dominant States for live cattle exports. These states supply around three-quarters of all live cattle exports from Australia with WA supplying around 40 percent of national exports of live cattle. The WA trend in export volumes since the mid-2000s is upwards and opposite to that for WA's live sheep exports.

Since 2006 WA has annually exported less than 15,000 live goats, forming less than 15 percent of national exports.

Key historical incidents that have led to suspensions of live trade from Australia are outlined in this report.

Published studies that examine the economic importance to Australia of the live export trade are summarised. These studies typically show that the trade enhances the value of Australia's red meat industry. Studies of a cessation of the trade usually project consequential reductions in beef, lamb and mutton prices. Importantly, these studies note that the regional impacts, especially in areas dependent on the trade, such as WA's northern beef region and the WA southern agricultural sheep region, would be particularly disadvantaged. However, meat processors are shown to benefit from the cessation of live exports due to access to more animals at cheaper prices.

There are 6,074 businesses with sheep in WA and live sheep export generates income in the range of \$175 million to \$275 million. Sheep production occurs mostly in the higher rainfall southern parts of the WA agricultural region. The principal markets for these sheep are Middle Eastern countries: Saudi Arabia, Kuwait, Bahrain, Qatar, Jordan and Oman. Many farmers value live export markets as they believe these markets enhance competition for the purchase of their sheep.

Live cattle exports from the Kimberley region are worth around \$120 million and make up 45% of the live cattle exports from WA. Exports from the Pilbara region are

relatively small at 6%, with a value of \$15 million. Exports from Geraldton have a value of \$27 million; however this port draws on a number of regions, but mainly from the Gascoyne and the Midwest. Fremantle, with 39% of the exports valued at \$106 million, draws on several regions including portions of the southern rangelands as well as the agricultural region. In 2009/10, about 390,000 cattle were exported from WA ports. Based on a CIF value of \$846 per head, the total worth of live exports was \$330 million in 2009/10.

The impacts on WA businesses of a termination or phased reduction in live animal trade depend on the rate of reduction, the importance of the live trade to the particular business and the importance of the trade to the region in which the business operates. This report quantifies the sheep, beef and goat supply chains in WA and discusses which parts of these supply chains and regions are vulnerable to a loss of the live export trade.

Depending on the location and nature of the farm or pastoral business, the reductions in business profits are projected to range from minor to substantial. At the industry level, pastoral beef production is the most vulnerable. The sheep industry will also face revenue reductions, mostly for farmers greatly reliant on profits from sheep production and who are locked into sheep production. However, many other farmers who engage in mixed-enterprise farming that includes sheep or cattle production, may be able to transition to alternative enterprises and either lessen their losses or potentially gain, given current margins for some crops.

The impacts on other participants in the supply chain are strongly linked to how farmers and pastoralists respond to any reduction or cessation in the live export trade. If farmers and pastoralists choose to exit the industry or reduce their animal production in response to likely lower prices that would follow a reduction in the live export trade, then the support industries and the abattoirs eventually will suffer through reduced throughput.

Various types of analyses presented in this report indicate that reductions in live exports of sheep or cattle will lessen farmers' and pastoralists' incomes, principally through reduced prices they receive, and in the case of northern region pastoralists, greater transport costs. Meat processors are beneficiaries in the near and medium term, but not necessarily in the long term if flock and herd sizes diminish as resources are switched into alternative land uses.

The economy-wide aggregate impacts associated with a cessation of the live trade are relatively minor (in percentage terms), however the regional economy effects in particular regions, such as the northern beef region, would be large. The recent experience with the trade suspension involving live cattle sent to Indonesia has revealed the sorts of regional economic disadvantage that trade cessation can unleash. A case study of the impacts of the recent trade suspension with Indonesia is presented to illustrate actual impacts of these market closures.

Preamble

On 16 June 2011 the Senate referred the improvements in animal welfare for Australian live exports for inquiry and report. A Senate Committee is charged to:

1. Investigate and report into the role and effectiveness of Government, Meat and Livestock Australia, Livecorp and relevant industry bodies in improving animal welfare standards in Australia's live export markets, including:
 - a) The level, nature and effectiveness of expenditure and efforts to promote or improve animal welfare standards with respect to all Australian live export market countries;
 - i) expenditure and efforts on marketing and promoting live export to Australian producers;
 - ii) ongoing monitoring of the subscription to, and practise of, animal welfare standards in all live export market countries;
 - iii) actions to improve animal welfare outcomes in all other live export market countries and the evidence base for these actions.
 - b) The extent of knowledge of animal welfare practices in Australia's live export markets including:
 - i) formal and informal monitoring and reporting structures;
 - ii) formal and informal processes for reporting and addressing poor animal welfare practices.
2. Investigate and report on the domestic economic impact of the live export trade within Australia including:
 - a) Impact on regional and remote employment especially in northern Australia;
 - b) Impact and role of the industry on local livestock production and prices;
 - c) Impact on the processing of live stock within Australia.
3. Other related matters. The reporting date is 25 August 2011.

Introduction

On 8 June 2011 Minister Ludwig announced the suspension of the live cattle trade with Indonesia and subsequently on June 16 a Senate Committee inquiry into the live trade of all animals from Australia was announced. Submissions to that committee were welcomed.

This is a DAFWA report on the economic importance to Western Australia of the live animal export trade. It is therefore relevant to point 2 of the committee's terms of reference. This report examines the historical and current economic importance of this live trade and provides estimates of impacts if this trade were to cease.

Whilst not ignoring the recent impacts of the brief trade suspension with Indonesia, concerning live cattle exports, this report mostly considers the wider general issue of the economic and regional importance of the live trade in animals for Western Australia (WA).

Historical Perspective

For Western Australia the main live export industries, by economic ranking, are sheep, cattle and goats.

Live sheep trade

From the 1970s to the early 1990s, WA's live sheep trade was based on the export of cast-for-age merino wethers. This suited the many farmers who were interested mainly in wool

production and required an outlet for wethers at the end of their wool-productive life. It also suited traders in most Middle East countries as older wethers were heavier than young wethers, and the traders could buy on a per-head basis yet sell the meat on a weight basis.

However, following the collapse of the reserve price scheme for wool in 1991 and a subsequent period of depressed wool prices during the 1990s, many farmers switched from wool production toward cropping. Supporting this transition were other influences including: (i) a period of high grain prices in the mid-1990s and late 2000s, (ii) availability of productivity-improving innovations to support crop production, (iii) some very favourable years for grain production in the 1990s and, (iv) some consecutive dry years in the 2000s that made retaining sheep an expensive strategy. Accordingly sheep numbers in WA declined from 38.4 million in 1990/91 to 14.7 million in 2009/10. Over nearly the same period the number of live sheep exported from WA fell from a peak of 4.5 million in 1993 to 2.4 million in 2010 and the trend in numbers exported is downwards (Figure 1). The severe drought in 2010 in Western Australia has ensured further downward pressure on the size of its sheep flock and means that live exports of sheep will continue to be limited.

The more than 60 percent decline in the WA sheep population since the early 1990s has reduced the numbers of sheep available to be exported live. However, due to similarly pronounced reductions in sheep numbers elsewhere in Australia, the live sheep trade remains strongly dependent on WA as a source of live sheep (Figure 1). WA's continues to supply around three-quarters of the national exports of live sheep.

The age of sheep exported live fell during the late 1990s and into the 2000s because of the shortage of sheep and changing flock structures that increasingly favoured lamb rather than wool production. The strong competition for sheep together with limited supply and a market preference for younger sheep saw sheep prices rise substantially in the early 2000s and again in the late 2000s (Figure 2). Sheep prices have remained strong, in spite of the appreciation of the Australian dollar over much of the last decade (Figure 2).

Figure 1. WA live sheep exports

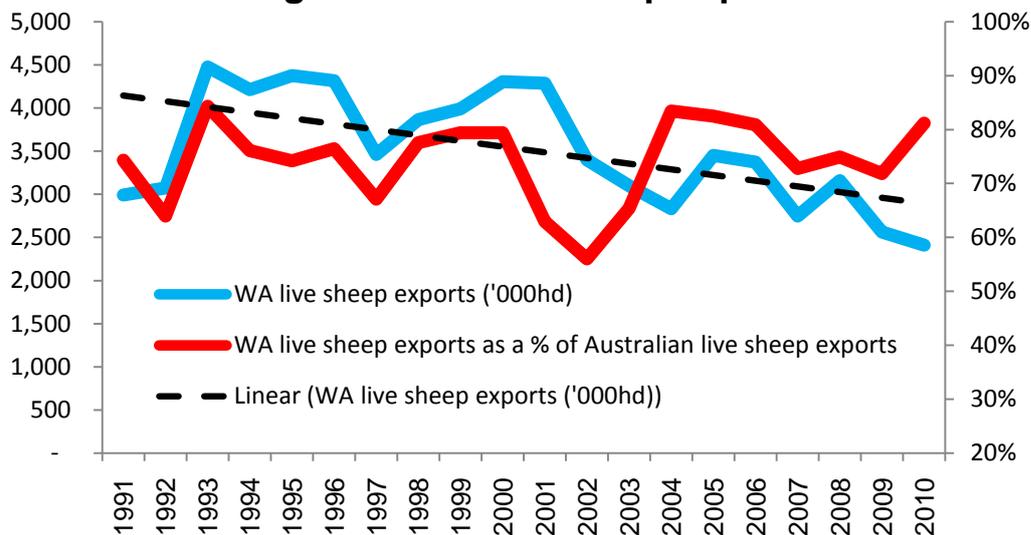
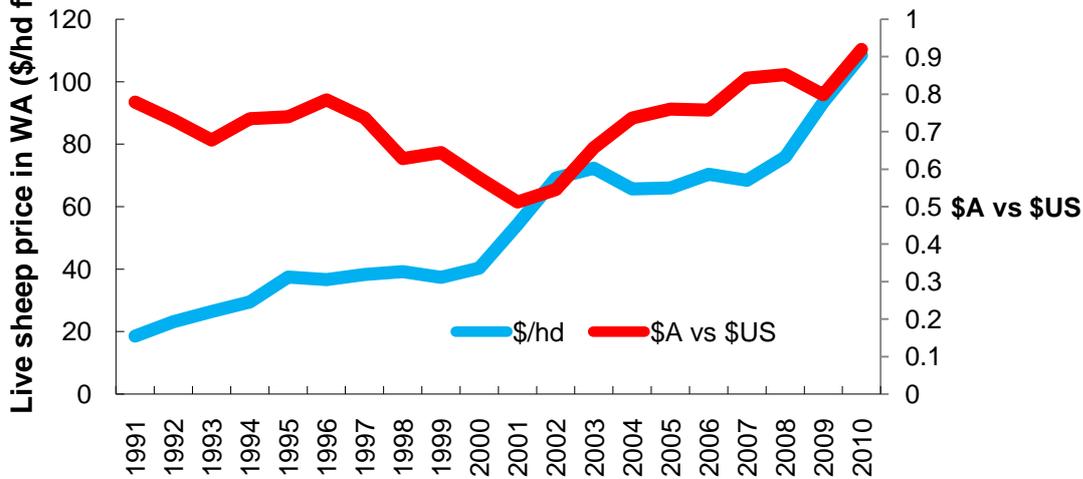


Figure 2. WA live sheep export prices and the Aussie dollar



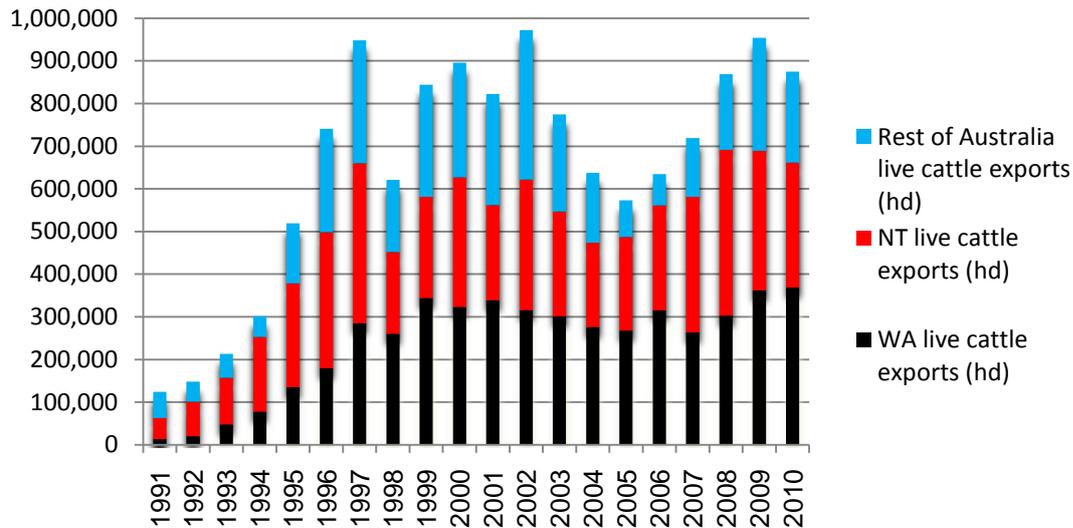
Historically, sheep death rates during sea transport from WA declined from a peak in 1992 to 2004 and have remained at approximately 1% since then (see Figure A.1 in the Appendix). The main reasons for reduced mortalities were the declining age and weight of the sheep exported (peer-reviewed research by DAFWA has shown that higher death rates were associated with older sheep and heavier/fatter animals). Other factors were improvements in land transport, preparation in pre-embarkation feedlots and efficiencies in loading onto ships as well as improvements in shipping and discharge at destination. Greater regulation of the industry through the Australian Standards for the Export of Livestock was introduced in 2004. There was further tightening of regulations for livestock ships in Marine Order 43 in recent years.

Live cattle trade

WA and the Northern Territory are the dominant States for live cattle exports. Together these states supply around three-quarters of all live cattle exports from Australia with WA supplying around 40 percent of national exports of live cattle (Figure 3). The WA trend in export volumes is upwards and thus opposite to that for its live sheep exports.

Throughout the 1990s the live cattle export trade from WA rapidly emerged to become an important feature of the WA beef industry, particularly in pastoral regions. Since the late 1990s through to just before the brief trade suspension with Indonesia in June 2011, WA regularly annually exported around 300,000 live cattle, with the main export destination being Indonesia. Early in 2010, Indonesia introduced a quota on the bodyweight and number of live cattle imported from Australia.

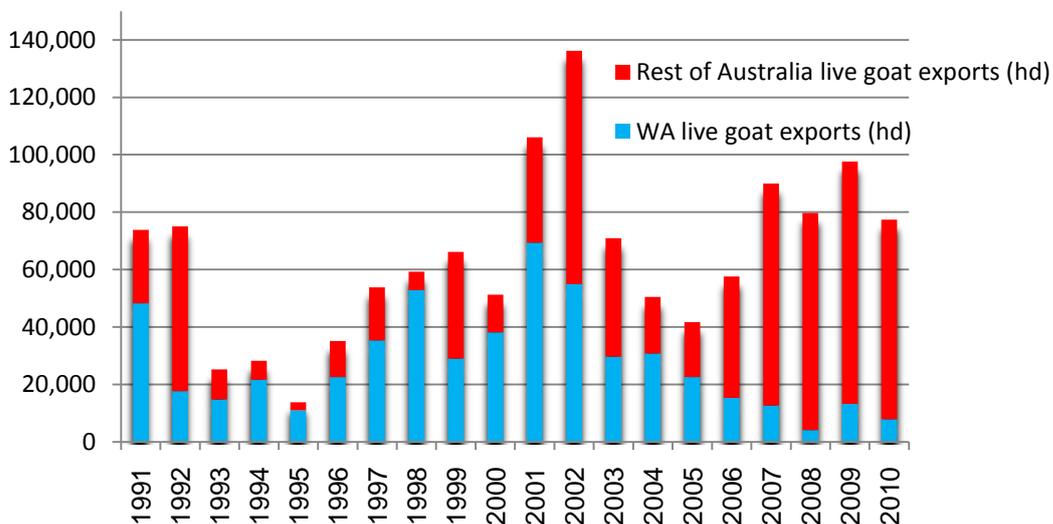
Figure 3. Live cattle exports from Australia



Live goat trade

The live export of goats from WA is a minor export industry. Since 2006 WA has annually exported less than 15,000 live goats, forming less than 15 percent of national exports (Figure 4). The trend in export numbers is downwards.

Figure 4. Live goat exports from Australia



Previous problems with the live export trade

1990

Suspensions of live trade from Australia have occurred previously for various reasons. In August 1990 following Iraq's invasion of Kuwait, the ensuing war led to the temporary suspension of the trade to that country. Later in November 1990 Saudi Arabia rejected a

shipload of 86,000 sheep on disease grounds. Of this cargo, 54,000 were subsequently unloaded in the United Arab Emirates (and disease issues were not evident), and the remaining 26,000 sheep were unloaded in Jordan but not until mid-February, 1991 (and disease problems were also not identified). In response, Minister Kerin announced a halt to the trade with Saudi Arabia, and this suspension lasted until 1999. Sheep exports to Saudi Arabia recommenced under new arrangements including age restrictions and pre-embarkation vaccination to control the disease scabby mouth.

2002

From July 2002 through until the end of October 2002 shipments into the Arabian Gulf were limited to cattle sourced above the 26th parallel and those cattle to principally be *bos indicus*. This stipulation followed unacceptably high cattle mortalities experienced on a shipment from southern Australia to the Arabian Gulf in the early northern summer of 2002. The restriction has been effective in preventing recurrence of such losses.

In October 2002 the Federal Government ordered a halt to live sheep exports from Portland in Victoria following high stock losses en route to the Middle East. Minister Truss indicated, however, the problem appeared to be related to the type of sheep and their preparation at Portland, rather than any poor shipping conditions.

2003

In August 2003 Saudi Arabia rejected a shipload of 57,000 sheep, alleging scabby mouth¹. In the following month Minister Truss announced an indefinite halt to the live sheep trade to Saudi Arabia pending an agreement between the respective governments about conditions for resuming shipments. Negotiations with the Eritrean government led to the sheep being off-loaded over several days in late October. The shipment involved deaths of almost 10 percent of the sheep, principally due to the very protracted 80 days voyage.

Also in October 2003 Minister Truss announced a review into the livestock export industry that subsequently became known as the Keniry Review. One of the outcomes of this review was the introduction of the Australian Standards for the Export of Livestock (ASEL) in 2004. The ASEL are administered by the Australian Quarantine and Inspection Service and regulate conditions for the export of livestock from Australia.

The live sheep trade with Saudi Arabia resumed in mid-2005 following the signing of a Memorandum of Understanding between the respective governments. Around this time, the World Organisation for Animal Health (OIE) introduced guidelines for the welfare of animals, *inter alia*, during sea transport. The guidelines address the issue of a dispute over the health status of animals on arrival at destination countries after a sea voyage.

2006

A national television program, *60 Minutes*, aired footage showing cruel treatment of Australian-origin cattle at abattoirs in Egypt. Minister McGauran announced a temporary ban on the export of live cattle to Egypt. Although the ban was lifted in 2008, conditional on slaughter only in approved abattoirs, no cattle were exported to Egypt until March 2010 when 16,500 head were shipped from Fremantle to an approved cattle feedlot and abattoir in Ain Sokhna.

¹ A veterinarian from the Saudi Arabian Ministry of Agriculture rejected the shipment on the grounds that 6% of the sheep were infected with scabby mouth, which was above the 5% acceptance level for the trade to Saudi. The Australian veterinarian on board the vessel estimated the incidence of scabby mouth to be 0.35%. Subsequently, the overall health of the sheep was confirmed by the OIE Regional Co-ordinator in the Middle-East. (see p. 29, Keniry Report (2003))

2011

A national television program, *Four Corners*, aired footage of cruelty to Australian-origin cattle being slaughtered in Indonesian abattoirs. Soon after on 8 June 2011 Minister Ludwig suspended the Australian live cattle trade with Indonesia. In early July, agreements on the conditions for the resumption of trade, and announcements by the governments of Australia and Indonesia have paved the way for a resumption of the trade in July 2011. The Indonesian Government will allow the importation of 500,000 head of cattle from Australia in 2011.

Known historical costs of trade disruption or cessation

In 2003, following the rejection of a shipment of live sheep by Saudi Arabia the Federal Government purchased the sheep and paid for their care and acceptance in Eritrea. Subsequently, the Government's costs of resolving this matter (around \$10 million) were fully recouped through a levy on the live export industry. The incident also led to the Keniry Review, funded by the Government.

This review noted that "Since the closure of the Saudi Arabian market in late October 2003, wether prices in Western Australia have dropped by A\$10 to A\$20 per head. This highlights the significance of the livestock export trade in providing market competition with improved returns to producers." (p.15, Keniry Review (2003)). Given that formerly around 3 to 4 million wethers were exported live annually from Western Australia, the initial foregone revenue to sheep producers in Western Australia would have been around \$53 million in 2004. This cost excludes any flow-on effects to other sheep prices or sheep meat substitutes such as beef.

Previous reviews and studies of the live export trade

Trebeck (1989) and McLachlan (1989) outlined the political and industrial ramifications that surrounded the attempt in 1978 by the Australasian Meat Industry Employee's Union (AMIEU) to end or at least highly regulate Australia's trade in live sheep. The events involved industrial action by the AMIEU, the Waterside Workers' Federation and the Australian Workers' Union; legal action in the Federal Court by Elders and the Commonwealth Government against the AMIEU; plus the political involvement of the state governments of Western Australia and South Australia, the Commonwealth Government, the ACTU and Trades and Labour Councils as well as a range of agro-political organizations. The legal action to cease or highly restrict the live trade failed.

Hassall & Associates (2000) describe several regional businesses in Western Australia that directly support the live sheep trade. Due to the location and nature of some of these businesses, an implication of their study is that almost certainly some of these businesses would have difficulty finding other similarly profitable end-uses for their sheep-related assets, if a sudden halt or reduction in the live sheep trade occurred.

ACIL-Tasman (2009) reported on the live sheep export trade. The ACIL-Tasman report was commissioned by the RSPCA and ACIL-Tasman made assumptions that led to their finding that cessation of the live trade would have little impact on farm businesses. They made the bold assumption that lamb and mutton prices would not change as a result of the closure of the export trade and so, of course, there is little surprise in their study's conclusion of little impact on farm businesses of closure of the live trade.

By contrast, a study by the CIE (2011) study does not impose that assumption and so generates different findings showing the farm sector would be economically disadvantaged by the cessation of the live export trade. Quirke (2011) also has presented the key findings

of the CIE study. The CIE study finds that the farm level GVP (gross value of production) for Australia's red meat industry would have been \$247 million higher each year due to the live trade over the study period 2005/6 to 2008/9. The CIE found that on average across Australia, lamb and mutton prices would decline by 12 and 15 percent respectively due to cessation of live exports. Importantly, they note that the regional impacts, especially in areas directly affected by the trade (e.g. northern beef in WA and sheep in the agricultural region of WA) would be affected to a much greater extent.

The CIE study also found that processors would benefit from the cessation of live exports. Although the CIE do not highlight this finding; nonetheless it is a key finding. As shown in Table 5.4 (see below) of their report, processors' GVP increases by \$108 million when live export is prohibited.

5.4 Impact of the live trade on cattle and sheep industry GVP and value added^a

		<i>Gross value of production</i>			<i>Value added</i>		
		Cattle	Sheep	Total	Cattle	Sheep	Total
<i>Total benefits</i>							
Farm sector	\$m	-128	-119	-247	-47	-64	-110
Exporters	\$m	-40	-30	-71	-8	-6	-14
Processors	\$m	70	38	108	18	8	25
Total	\$m	-98	-111	-209	-37	-62	-99
<i>Percentage contribution</i>							
Farm sector	%	52	48	100	42	58	100
Red meat chain	%	57	43	100	57	43	100

^a Average impact over the period 2005-06 to 2008-09.

Source: GMI model and CIE calculations.

By contrast the red meat industry's other two main stakeholders (farm sector and exporters) are in total worse off annually by \$318 million (in GVP). By far, the principal losers are farmers (annual losses of \$247 million) and the main beneficiaries are processors (annual gains of \$108 million).

There are, however, limitations and potential deficiencies of the CIE study. These can be listed as:

- (i) No reporting of economy-wide or multiplier impacts that would accompany cessation of the trade. Where live trade is the main industry in a region (e.g. Kimberley beef) then regional employment and income impacts are likely to be particularly severe yet this study does not capture these important social and economic consequences.
- (ii) Because processing is input and labour-intensive relative to farm-level animal production, the economy-wide economic consequences of the cessation in live animal export trade may be far less than indicated by the partial analysis of the CIE.
- (iii) The CIE study fails to capture important spatial and regional differences as its focus is on the Australian red meat industry. Disaggregation of impacts would highlight the particular disadvantage that WA regions would experience. Abrupt cessation of exports would unleash a major structural change, affecting farm profitability, and in regions highly dependent on the live trade, serious erosion of pastoral lease and land values could occur.
- (iv) The CIE study uses coarse estimates of price elasticities of supply and demand. However, a spread of supply responses in each region and across regions is

likely. A single elasticity estimate does not capture the spread of business impacts. By illustration, a crop dominant farmer in the central wheatbelt of WA is unlikely, following a ban on live export of shippers, to drastically alter his flock management and switch into prime lamb production due to the time, expense and skill required. His supply response of sheep will be relatively inelastic. The same response is likely (in the short term) for a Kimberley beef producer. By contrast some other less crop dominant farm businesses may be much more elastic in their supply response, perhaps preferring to grow more crops rather than sheep, following a cessation of live animal exports and the likely fall in farm-gate prices for sheep and cattle.

- (v) All analyses exclude the important medium term consequences of productivity impacts. If red meat production at the farm level is made less profitable then farmers have less capacity to invest in productivity-enhancing innovations and activities. The future prosperity of the red meat sector depends on such innovation and the economic consequences of a reduction in productivity performance at the farm level could be serious in the long term.

ABARES have produced one study on Australia's live cattle export trade (Martin et al., 2007) and have also produced a more general analysis of Australia's export of live animals (Drum and Gunning-Trant, 2008). Martin et al observed that as live cattle exports are very important to some regions of Australia, the economic impacts of changes to livestock export standards or fluctuations in live cattle markets are likely to be concentrated on particular producers and regions. They found that on average the financial performance of specialist live cattle export properties has greatly outstripped that of nonspecialist exporters and nonexporters in each of the six years to 2004–05, generating much higher farm business profits and higher rates of return to capital.

The study by Drum and Gunning-Trant (2008) assessed the size and value of Australia's live export sector and analysed the factors influencing global trade and Australia's share of this trade over time. They identified that foreign demand has provided Australian cattle producers with a broader network of markets for which they have adapted their production methods, particularly in northern WA and in the NT. The demand for and preference for live animals is likely to remain strong in these markets, especially as many Asian countries have a comparative advantage in the latter stages of beef production—availability of low cost agricultural byproducts used for cattle feed and low cost labour associated with meat processing. The researchers comment that if Australia were to restrict live exports then significant regional economic effects, particularly on the cattle industry of western and northern Australia, would be likely.

Regarding the export trade in live sheep, Drum and Gunning-Trant indicate that any restrictions on this trade from Australia would generate regional economic effects that would be felt particularly in the sheep industry of WA. They observe that the potential for the domestic market to absorb the surplus supply caused by a cessation in live sheep exports is limited.

MLA (2007) commissioned a research report to examine regions highly reliant on the live animal export trade. The reliant regions they identified included northern WA (cattle), the NT (cattle), Qld (cattle), southern WA (sheep and cattle) and Victoria (dairy cattle). They estimated the impact of trade cessation on on-farm incomes in the short, medium and long term. Their estimates accounted for the direct loss in income to producers of live export sheep and cattle. Although the impact on farm income was expected to decline over time, they assumed the market loss would endure, without any offsetting demand in new markets, and so the income effects were expected to be significant for at least 10 years following cessation. Under the price response and market loss assumption employed in this study, the present value of income losses over the 10 year period following trade cessation was

estimated to be over \$2.2 billion in total, with southern WA sheep experiencing the greatest impact (see Table 4 from their study below).

Estimates of on-farm income impacts of trade cessation (\$m)^a

Region	Year 1	Year 5	Year 10	Present value (Years 1-10) ^b
Northern WA cattle	-56	-52	-24	-348
Northern Territory cattle	-82	-66	-56	-514
Queensland cattle	-8	-6	-4	-48
Southern WA cattle	-149	-120	-104	-939
Southern WA sheep	-27	-12	-8	-120
Victorian dairy cattle	-31	-42	-42	-291
Total	-353	-298	-238	-2 259

Source: MLA 2007

a Accounts for the direct loss in income to producers of live export sheep and cattle but does not include the loss in income to other producers within the industry as a result of domestic industry price effects or the positive, offsetting income effect for those producers who switch to alternative enterprises following the loss of live export markets. **b** Calculated over a 10-year period using a 7 per cent discount rate.

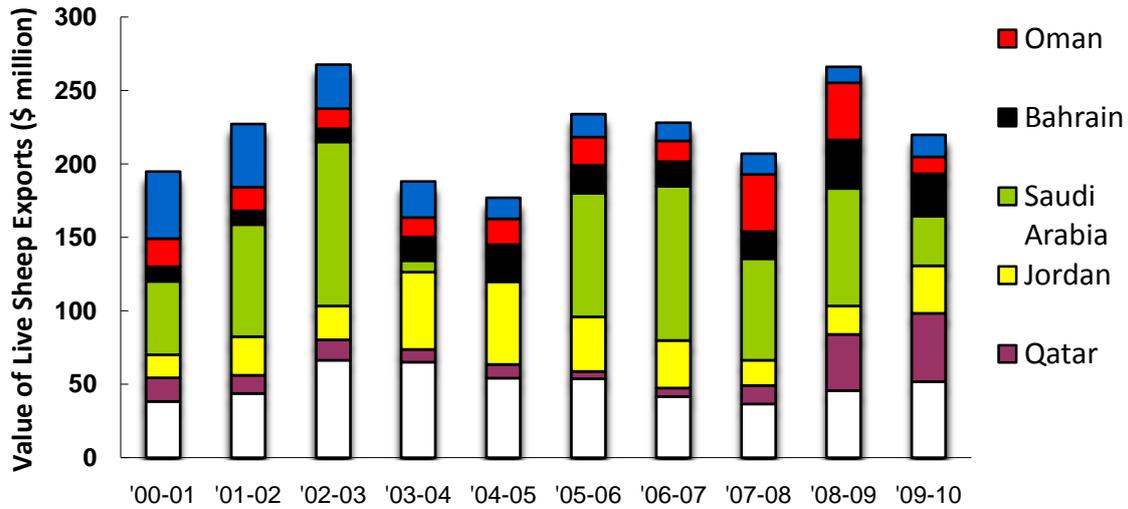
Although all the studies mentioned above often consider different time periods and use different data sets and study methodologies, they uniformly identify that WA, and particularly its farm and pastoral sectors, would be particularly worse off following any cessation to the live export trade in cattle and sheep.

Current State of WA's Live Export Trade

Main markets: trends and issues

Live sheep exports are an important source of revenue to WA's farm sector, generating annual export income in the range of \$175 million to \$275 million (Figure 5). The downward trend in numbers of sheep exported (see Figure 1) has been largely offset by an increase in the price paid for these sheep (see Figure 2) such that WA sheep export earnings have remained above \$200 million in recent years.

Figure 5. Main markets for WA live sheep exports

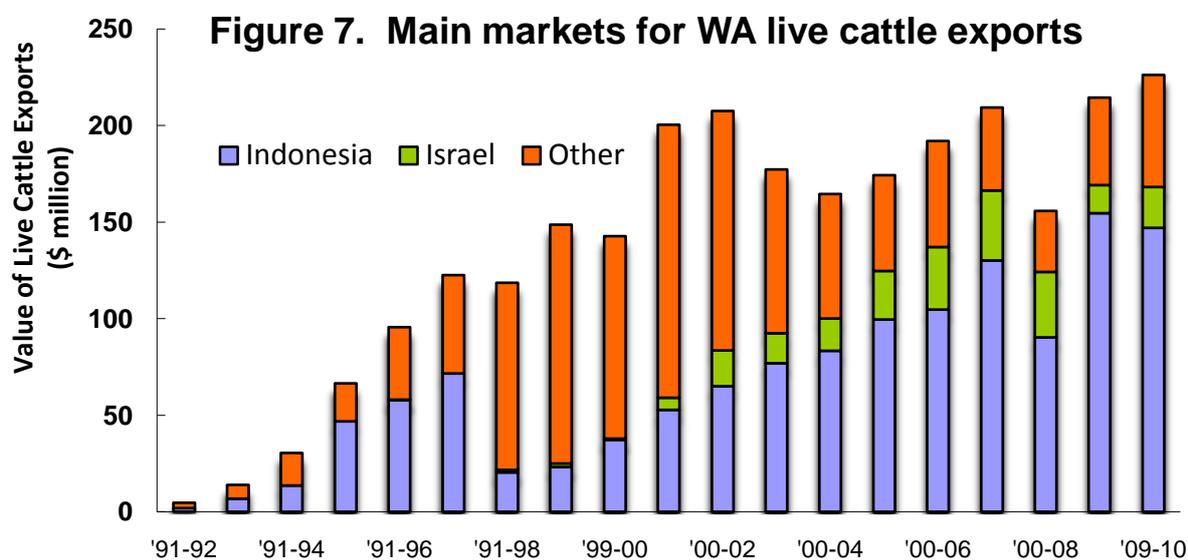


The principal markets for these sheep are Middle Eastern countries: Saudi Arabia, Kuwait, Bahrain, Qatar, Jordan and Oman (Figure 6). Saudi Arabia has often been the largest importer of live sheep from WA, although as mentioned earlier, this trade with Saudi Arabia has been previously subject to suspension.



Figure 6: Middle East destinations of WA live sheep and cattle

Since the end of the 1990s live cattle exports from WA have maintained an economic importance similar to that of live sheep exports. Typically export earnings of around \$200 million are generated annually from WA's live cattle exports (Figure 7). Since the late 1990s and early 2000s the volume of cattle exported to Indonesia has grown rapidly causing a decline in exports to many other destinations, apart from Israel. Indonesia has emerged during the 2000s to be by far the principal destination of live cattle exports from WA. The cattle supplied to Indonesia mostly come from the Kimberley region of the State.



Value of live sheep trade to regions of WA

There are 6,074 businesses with sheep in WA and live sheep export generates income in the range of \$175 million to \$275 million (Figure 5) per annum.

Sheep production occurs mostly in the higher rainfall southern parts of the WA agricultural region (Figure 8). In the medium to high rainfall areas a common flock structure is where a proportion of ewes (up to 35%) are mated to terminal sires for prime lamb production, thus still allowing for replacement of breeding ewes. Unless the merino wethers have made prime lamb specifications they are generally sold to the live sheep trade, usually at one or two years of age and any of the prime lambs that do not make specifications are also sent to that market. In the low rainfall areas wool is often the main production focus, with wethers and surplus ewes are sold to the live sheep trade.

In February 2010, DAFWA, in collaboration with MLA, conducted a survey of sheep producers' attitudes towards live sheep exports. The key findings from the 134 producers that participated were:

- 74 per cent of WA producers supplied sheep to the live export trade.
- Over 50 per cent of producers indicated 'better sale price returns' as a reason for supplying to the export market. Other main reasons were 'fits with optimal enterprise mix' (37%) and 'easier flock management' (34%).
- 80 per cent of producers supplying wethers indicated that the average age supplied was up to 2 years old indicating that the live export trade is no longer seen as just an outlet for older/cull wethers.

- When asked for other comments about the live sheep trade, the two most common comments volunteered were that it “created competition” (28 per cent), and that it was “an important market option” (19 per cent).

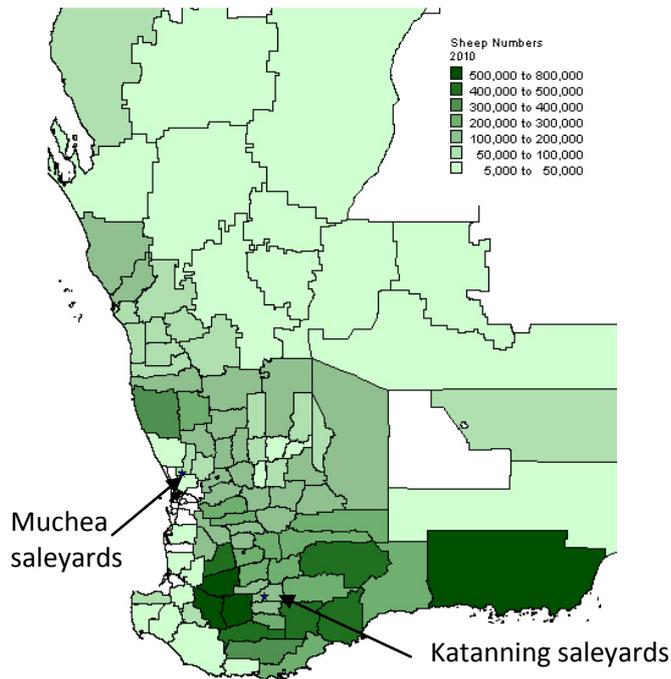


Figure 8: Sheep producing regions of WA

Table 1 outlines the regional importance of sheep production and live sheep export trade in WA. Three regions dominate the supply of sheep for live export; the Upper Great Southern and Lower Great Southern that are serviced by the Katanning saleyards and the Midlands that is serviced by the Muceha saleyards.

Table 1: The regional importance of the WA live sheep trade in 2009/10

	No. of sheep and lambs	No. of businesses	Number of wethers	Percentage of total live exports
Perth	19,956	90	4,584	0.2%
South West	1,061,798	827	220,538	10%
Lower Great Southern	3,769,863	1,344	734,026	33%
Upper Great Southern	3,943,612	1,175	697,915	31%
Midlands	3,439,193	1,653	660,106	30%
South Eastern	1,059,574	411	209,589	9%
South Eastern Rangelands	71,774			
Central	977,206	574	216,761	10%
Central Rangelands	339,908			
Total	14,682,883	6,074	2,743,516	2,215,691²

² Total number of live sheep exported in 2009/10 (Source: ABS & DAFWA)

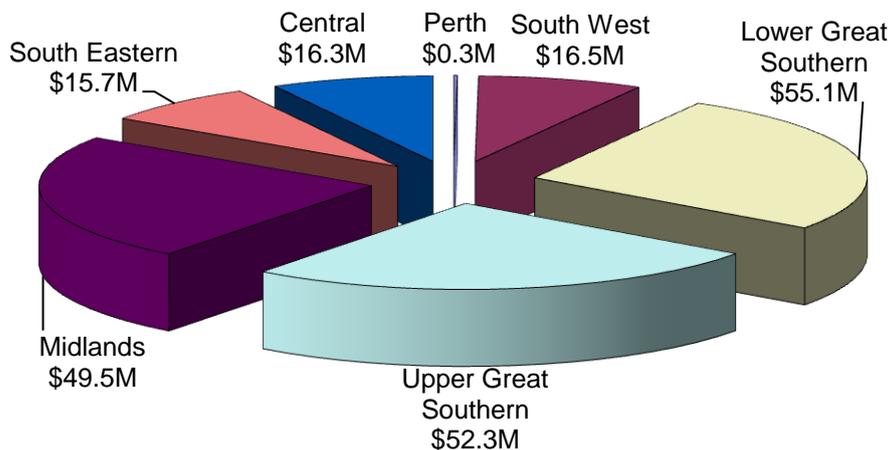
Table 2 shows the value of the trade, the numbers exported and the value (\$/hd) for the last five years. The short supply of sheep and the high demand from countries experiencing increasing wealth and consequently increasing demand for protein has increased the value of sheep per head. So despite the decline in numbers the value to the farm sector remains significant.

Table 2: Quantities and values of WA live sheep exports: 2005/6 to 2009/10

	Value of trade (\$ million)	Number exported (million hd)	Unit value (\$/hd FOB)	Unit value (\$/hd farm gate)
2005/06	234.0	3.4	68.8	52
2006/07	228.1	3.3	70.0	50
2007/08	207.0	3.0	69.1	47
2008/09	266.1	3.1	85.5	60
2009/10	219.9	2.2	99.3	75

The estimated value of live sheep exports from each region in 2009/10 is shown in Figure 9, using farm gate prices from the Katanning sale yard data.

Figure 9: Value of live sheep exports from WA's sheep producing regions



Value of live cattle trade to regions of WA

According to CIE (2011, p20) the northern Australian cattle industry has undergone significant structural adjustment to target the live export market, and that between 2006 and 2009, 39% of the cattle exported live from Australia were from northern Western Australia.

Based on the average number of cattle exported between 2005 and 2009 through the five ports that handle live exports in WA, and on the estimate of the farm gate value of \$585 per

head (CIE, 2011, p29), the farm gate value of exports from WA is estimated to be \$186.9m (see Table 3).

Table 3: Farm gate, FOB and CIF value of live cattle exports from WA

	Average number of cattle exported 2005-09	Total farm gate value (\$ million) ^a	Total FOB value ^b	Total CIF value ^c
Broome	87,763	51.3	\$57.6	\$74.3
Wyndham	56,449	33.0	\$37.1	\$47.8
Port Hedland	17,845	10.4	\$11.7	\$15.1
Geraldton	31,787	18.6	\$20.9	\$26.9
Fremantle	125,718	73.6	\$82.5	\$106.4
Total	319,562	\$186.9	\$209.8	\$270.4

^a based on a farm gate price of \$585 per head ^b based on an FOB price of \$656 per head

^c based on a CIF price of \$846 per head

With an estimated FOB price of \$656 per head (CIE, 2011, p29) the total value of cattle exports increases to \$209.8 million as reflected in Table 3. The FOB price includes all costs associated with getting the cattle from the property onto the ship. These costs include road transport, transit insurance, agents' fees, feeding at pre-export assembly depot, wharf charges, levies, third party veterinarians, AQIS and quarantine fees and administration charges.

Finally, with a CIF (cost, insurance, freight) price of \$846 per head (CIE, 2011, p29), the total revenue from live exports in WA, based on a five year average of exports is in the region of \$270.4 million. CIE reports that the largest single cost item in the supply chain is the cost of sea freight, although it is highly variable over time and shipments.

Based on the above data, exports from the Kimberley region make up 45% of the live cattle exports from WA with a value of \$122 million, while exports from the Pilbara region are relatively small at 6%, with a value of \$15.1 million. Exports out of Geraldton have a value of \$26.9 million; however this port draws on a number of regions, but mainly from the Gascoyne and the Midwest. Fremantle, with 39% of the exports valued at \$106.4 million draws on several regions including portions of the southern rangelands as well as the agricultural region.

In 2009/10, an estimated 390,000 cattle were exported from WA ports. Based on a CIF value \$846 per head, the total revenue from live exports was \$330 million. The Northern Territory Department of Resources reported that approximately 23,000 cattle from WA were exported through Darwin in 2010, which at a farm gate value of \$585 per head, would add \$13.5 million to the total revenue from exports. However, as reported earlier, these estimates do not include economy-wide or multiplier effects that would accompany cessation of the trade which would be significant in regions which are almost entirely dependent on the live export trade, such as the Kimberley.

CIE makes the point that it is important to note that the estimates of the value of the export trade provided above do not represent the total value that would be lost if the live export trade were to cease, as they do not account for alternative revenue potential to producers or losses to producers in relation to lower prices received in the meat processing industry. CIE also note that *"it is widely acknowledged that without live exports farm gate returns would be*

lower because of the lower demand for livestock and the higher transport costs involved in transporting animals to the alternative markets” (CIE, 2011).

Further it claims that the live export industry is credited with “*substantially improving the regional economies in Western Australia, Western Queensland and the Northern Territory*” as reflected in higher on-farm net returns (with flow on benefits to local communities) and a broader economic base to farm incomes which has had the effect of producers having more income stability. MLA (2007) indicated that in the absence of a meat processing facility in the north of the state, the only opportunities that beef producers have are the live exports from regional ports or trucking their cattle south for live export and/or slaughter.

MLA (2007, p37) also estimated that in 2005/06, the gross regional product directly attributable (businesses that comprise the value chain) to the live export trade from northern WA was \$355 per head of cattle exported and that which was indirectly attributable (other regional suppliers of goods and services) was \$174 per head.

In addition to the revenue generated there are other economic, social and environmental benefits from the live export industry, including:

- Employment – the pastoral industry is a significant employer in the rangelands, the source of most export cattle. CIE (2011, p16) reported that there are 12,924 jobs in the Australian live export industry with wages and salaries of \$987m, while MLA (2007) reported that there were 1,045 full time equivalent (FTE) jobs in northern WA associated with the live export trade and 1,672 FTE’s in southern WA.

The Indigenous Land Corporation reported (2010) that in 2009/10, 59 indigenous people were employed full time and 120 part time on the 28 indigenous held properties that participate in the Kimberley Indigenous Management Support Service (KIMSS) project.

- Productivity – CIE (2011, p66) report that the northern beef industry has experienced strong productivity growth in the past 20 years, with this growth being equivalent to that of broadacre cropping and higher than that observed in southern beef production. It suggests that “*these gains are likely to reflect, at least in part, the access to the live export market and considerable industry investment...instigated by the higher returns offered in the live export market relative to alternatives*” (CIE 2011, p67).

- Training – a number of properties in the Kimberley have established training facilities station hands. The focus has been on training indigenous youth in preparation for employment in the industry. They receive on-the-job training on working stations, completing certificates I and II in agriculture. Examples of properties where this training is being undertaken are Roebuck Plains, Myroodah and Noonkanbah. In 2009/10, 147 training courses were attended by indigenous people in the Kimberley facilitated by KIMSS (ILC, 2010, p87). These courses included corporate governance, land management, strategic planning and animal welfare. In the same period, there were 70 indigenous participants in the Pilbara (ILC, 2010, p88).

- Infrastructure development – the development of the livestock industry and its increased returns in recent years has facilitated investment in farm infrastructure on many properties. These developments have included water points, internal fencing to facilitate improved management, additional or improved yards and internal roads (MLA, 2007).

- Rangeland management – improved rangeland management has been achieved through seasonal reductions in stock numbers with stock being sold off at a younger age with only the breeders being retained; more intensive management which has been facilitated by water and fencing development; and the up-skilling of pastoral management which has contributed towards improved rangeland management and assessment skills (MLA, 2007).
- Regional community development – strengthening of the mainstream rural economy and providing opportunities for the participation of indigenous people through skill development, higher incomes, increased self determination, development of business acumen (MLA, 2007) and sustainable income generation through viable businesses.

A case study of impacts of the recent trade suspension

The following is a Kimberley case study. It draws upon benchmarking data collected by DAFWA and on interviews and conversations with pastoralists during the trade suspension. It is an illustrative case study. The property and people are fictitious although the numbers are real, being based on benchmark survey data used with permission. The case study is the financial outlook for this illustrative business in early July, just prior to the announced resumption of the trade by Indonesia's granting of import licences for the third quarter of 2011.

The fictitious yet illustrative couple, Jim and Sandy, own 'Acacia Hills Station' in the Kimberley region. They have owned Acacia Hills in partnership with an external investor for more than 20 years. Acacia Hills supports a cattle breeding enterprise; sale of light steers and heifers to the Indonesian live export market is the business's main source of income.

Jim and Sandy also own a farm in the northern agricultural district of WA that they use primarily to finish out of specification animals, and also to produce hay for use on the Kimberley station.

Station Characteristics

Acacia Hills has an area of 210,000 hectares, held under pastoral lease, which gives a right to graze livestock but not to clear land or grow agricultural crops. Acacia Hills is typical of Kimberley pastoral leases comprising of a variety of land types that have different pastures and carrying capacity. The best grazing land is the alluvial floodplain supporting broad areas of Bundle Bundle and Ribbon Grass, though this country comprises less than 20 percent of the station. The majority of the station is sandy dune country supporting a mixed grass community with Ribbon Grass and Soft Spinifex. The station experiences tropical monsoonal rainfall with the majority of rain occurring during the 'wet' season, with an average rainfall of approximately 500mm. During the 'wet' season, the station can be isolated by road for more than a month.

Enterprise Characteristics

Jim and Sandy run a Droughtmaster herd. In 2010 they had 5,200 breeders, with bulls, calves and sale cattle on hand, giving a total herd of 11,500 head. Their primary market is live export of light animals (<340kg) to Indonesia. The majority of these sale cattle leave through the port of Broome, which is 400km by road. Cull cows or young animals outside of specifications are transferred 2000km south to their northern agricultural region farm for fattening and subsequent sale to the domestic market. Cattle sold off their northern agricultural region farm are trucked a further 400km south to the Muchea saleyards (see Figure 8).

Table 4 lists categories of livestock sold from Acacia Hills in the calendar year 2010. Live export steers made up 53% of the number sold and 57% of the total value. While fewer heifers and cows were sold and their value per kg was less, they still contributed over a third of total income.

Table 4: 2010 livestock sales

	Number	Av Weight	\$/kg	Total (\$)	Market
Cows	433	414	1.22	218,000	Domestic
Heifers	980	290	1.46	416,000	Live Export – Indonesia
Steers	1,831	317	1.71	990,000	Live export – Indonesia
Bulls	182	428	1.36	106,000	Live export – other
Total	3,426			1,730,000	

Table 5 represents both the livestock sales that were expected for Acacia Hills during 2011 prior to the suspension of the live export trade in June, and the sales that have been completed in 2011 to date. It is evident from this information that the suspension has had a significant adverse impact on sale prices achieved. For example, steers sold to Indonesia prior to the suspension received \$2.05/kg, whereas steers sold after achieved an average \$1.43/kg. This represents a 30% reduction in price received.

Table 5: 2011 livestock sales, forecast vs actual (Actual in brackets)

	Number	Av Weight	\$/kg	Date Sold (pre/post suspension)	Total (\$)	Market
Cows	400	400	1.50		240,000	Domestic (Pilbara)
	(104)		(\$600/hd)	Pre	(62,400)	(South Australia)
	(155)		(\$700/hd)	Pre	(108,500)	(Harvey Beef)
Heifers	(170)	(400)	(1.05)	Post	(71,400)	
	1,000	290	1.70		493,000	Live Export – Indonesia
	(200)	(270)	(1.40)	Post	(75,600)	(South West Feedlot)
Steers	1,800	335	2.00		1,206,000	Live export – Indonesia
	(544)	(320)	(2.05)	Pre	(363,424)	(Live export – Indonesia)
	(500)	(370)	(1.60)	Post	(296,000)	(Domestic – South Australia)
	(170)	(300)	(1.50)	Post	(76,500)	(Live Export – Egypt)
	(200)	(320)	(0.90)	Post	(57,600)	(Live Export – Malaysia)
Bulls	200	400	1.6		128,000	Domestic/Live Export - other
Total	3,600				2,067,000	
	(2,043)				(1,111,424)	

Jim and Sandy were budgeting that total revenue from sales in 2011 would be as much as 15% higher (in nominal terms) than in 2010. Following the suspension of live export trade, they are apprehensive that prices received in 2011 may be as much 25% lower than 2010 which represents a reduction in gross income of as much as one third. They believe that

retaining livestock planned for sale in 2011 is not a viable alternative to reduced returns to sale. Acacia Hills does not have excess grazing capacity and Jim and Sandy believe that retaining sale livestock would have a devastating impact on the condition of their rangeland that would take many years to recover.

Jim and Sandy were able to generate a small operating profit in 2010 after all costs including their own drawings, interest and expenditure on new infrastructure, was incurred. Table 6 reflects some savings they have identified in response to the suspension. However, as a direct result of the suspension Jim and Sandy are expecting to suffer a significant operating loss in 2011 despite these savings.

Table 6: Acacia Hills cost structure

Expense Type	2010 (\$ actual)	2011 (\$ forecast)
Fixed Costs		
Interest	90,000	90,000
Rates and rents	54,000	54,000
Repairs and Maintenance	225,000	225,000
New Infrastructure	120,000	
Other (incl admin, insurance, telephone, etc)	94,000	94,000
Variable Costs		
Labour	434,000	434,000
Fuel	95,000	95,000
Animal Health	64,000	64,000
Fodder and Supplements	114,000	80,000
Selling Costs	245,000	245,000
Mustering (incl helicopter hire)	154,000	154,000
Bull replacement	40,000	20,000
Total Costs	1,729,000	1,555,000

The Personal Perspective

Based on conversations with pastoralists during the trade suspension the following views of a pastoralist couple like 'Jim and Sandy' are typical. They consider that retaining livestock planned for sale in 2011 is not a viable alternative to reduced returns to sale. Acacia Hills does not have excess grazing capacity and Jim and Sandy believe that retaining sale livestock would have a devastating impact on the condition of their rangeland that would take many years to recover. In this sense it is *"sell and be damned, but sell anyway!"*

They plan to continue their mustering program for the balance of the season irrespective of market developments. Any longer term major decisions need to wait until after this year is finished. In the meantime they plan to defer some expenditure this year (e.g. developing some new country, erecting new fences, purchasing new equipment and possibly cutting back on supplements). They are hopeful they will not need to lay off any staff. Yet they realise they are likely to receive only 54% of budgeted sales revenue whilst still having to cover 90% of a normal year's business costs. The result is they foresee they will be carrying a 399,000 loss forward into next year.

Nature of the regional sheep supply chains

The sheep industry in Western Australia supports a variety of businesses and people. Figure 10 depicts the sheep supply chain. Sheep destined for the live sheep trade tend to be 1 to 2 year old merino wethers. They are either sold at saleyards (Katanning or Muchea) or sold on-farm direct to buyers through livestock agents receiving 5% commission. The sheep are transported to feedlots where they are prepared for up to three weeks before being loaded on to a boat at Fremantle.

The demand for live animals comes from a cultural tradition where ceremonial slaughtering is required, particularly for the religious festival known as Ramadam. However, a large proportion of these live animals, around 70% are slaughtered at country of origin in abattoirs, but the infrastructure around the live sheep trade is maintained and subsidised by overseas governments to ensure a supply for Ramadam.

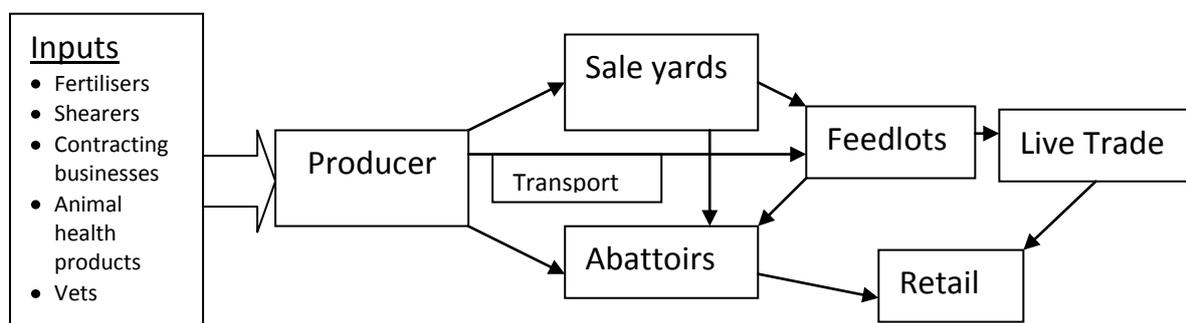


Figure 10: Key aspects of WA's sheep supply chain

The impact from a disruption or termination to the live sheep trade would vary for different components of the supply chain. The businesses directly involved with the trade will suffer the most (e.g. exporters). Many of these businesses are vertically integrated for risk management purposes, so the impact would be severe.

It is the producer's response that will be critical to other participants in the supply chain. If they choose to exit the industry or reduce sheep production in response to lower prices for sheep then the support industries and the abattoirs will suffer through eventually reduced throughput. An analysis of the likely response is provided below.

Nature of main supply chains

Beef-cattle Supply Chain

- The nature of the WA beef-cattle industry supply chains are summarised in Figure 11. Businesses in the supply chain are broadly categorised into three major sectors: Production, Processing/Wholesale, and Retailing/Export. The black arrows indicate the flow of products and links between businesses and the cattle-producing regions are illustrated in Figure 12.

Production

- In 2009/10 the WA cattle herd was 2.21 million head which supported disposals of 0.93 million head (42.08%) for processing, feeding and exporting. Disposals from the Kimberley and Pilbara were 0.199 and 0.108 million head respectively and disposals from the rest of WA were 0.613 million head.

- Pastoralists, livestock agents, on-station husbandry and stockmen, contract spaying, aircraft providers, auction/sale yards, road transport agents, fodder and water suppliers, and veterinary services are the other main parties in this sector.

Processing/Wholesale

- The processing and wholesale sector comprises five main sub-sectors: exporters of live animals, export abattoirs, domestic abattoirs, feedlotters and wholesalers. Out of WA disposals in 2009/10, 0.385 million head (41.4%) were exported live. Export abattoir received 0.113 million head (12.2%) for processing and export as boxed meat and carcasses. Only 0.029 million head (3.1%) went to domestic feedlots. Domestic abattoirs processed 0.347 million head (37.3%) for subsequent sale as meat for domestic consumption. The processing share between export and domestic abattoirs was 70% and 30% respectively; resulting in 78622cwt³ and 34,038cwt of carcase meat respectively. Interstate exports were 0.056 million live head (6%) in 2009/10.
- The main other businesses involved in the processing/wholesale sector are road transport (auction yard or farm to abattoir, abattoir to wholesalers and retailers), packaging services, and by-product exporters.

Retailing/Export

- Export markets for the WA beef-cattle can be divided broadly into four regions: 'Indonesia', 'South East Asia, US', 'Middle East, Russia, Turkey', and 'North East Asia, China'. Live cattle exports of 0.154 million head (40%) went to Indonesia, 0.216 million head (56%) to the 'Middle East, Turkey and Russia', 0.0116 million head (3%) to 'North East Asia, China', and only 0.004 million head (1%) to other South East Asian countries.
- Meat exports to the same four regions were 13,979cwt (41%) to Indonesia, 1,452 cwt (4%) to the US and other South East Asian countries, 5,918cwt (17%) to the Middle East, Turkey and Russia, and 12,688cwt (37%) to North East Asia and China.
- Product from the domestic slaughter of cattle usually goes to retailers in two main ways, through wholesalers and through direct transport to supermarkets. Of the 78,622cwt of processed meat from domestic abattoirs, around 18,618cwt (24%) goes to retail butchers, food services, restaurants and supermarkets through the wholesalers and the rest (76%) flows directly to supermarkets. Hides and other by-products are transported to tanneries and other by-product exporters and retail companies from both domestic and export abattoirs.
- A large number of agents and businesses are involved in the export sector. For live animal export livestock agents, transporters, veterinary service providers, pre-export assembly service providers at ports, fodder manufacturers, growers and retailers, port authorities, stevedores and provedores, ship agents, ship owners, government agencies (Australian Quarantine and Inspection Service (AQIS), Australian Maritime Safety Authority (ASMA)), and auditing and accounting service providers; all are involved. The meat export sector additionally requires packaging services, quarantine services, export agents, and involvement of government agencies.
- WA cattle production sector come from nine major regions in WA (Figure 12).

³ Note: cwt stands for 'carcase weight tonne'

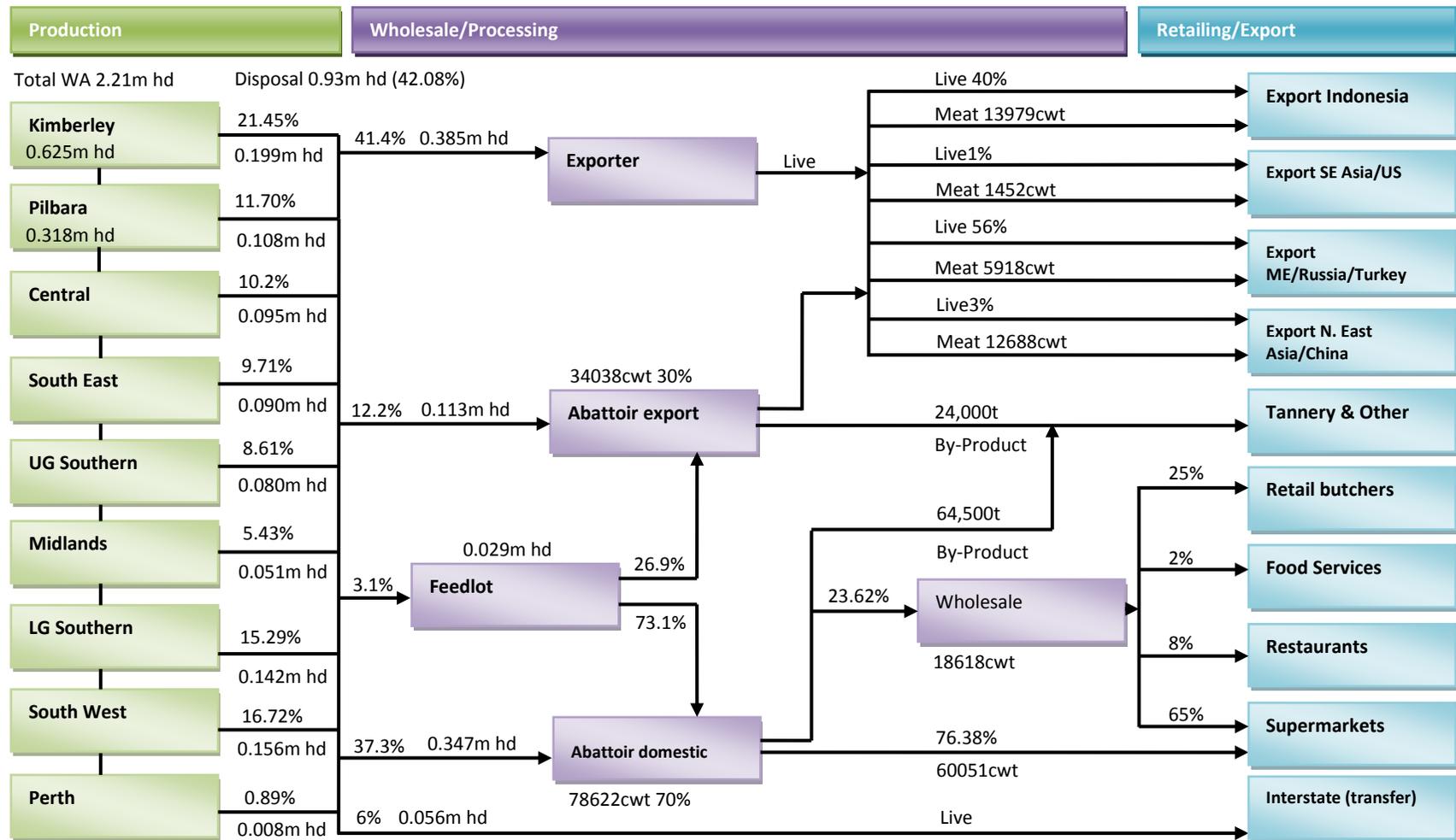


Figure 11: The WA beef-cattle value chain in 2009/10

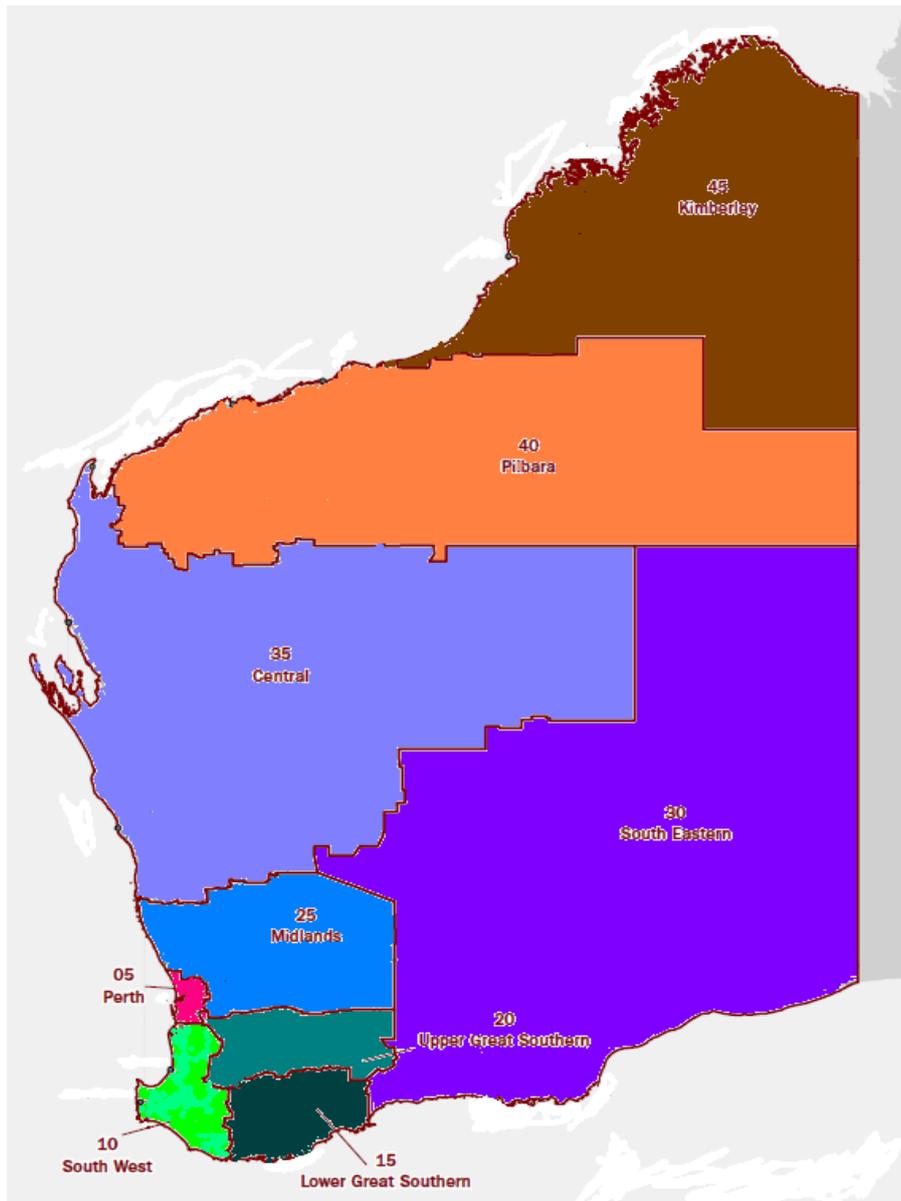


Figure 12: The beef-cattle and sheep producing regions of WA

(Source: adapted from ABS)

Sheep supply chain

- The sheep supply chain comprises three main sectors, similar to the beef supply chain; Production, Processing/Wholesale and Retail/Export (Figure 13).

Production

- WA's sheep flock in 2009/10 was 14.5 million animals that supported disposals of 5.81 million head (40%) for processing and export. There are very few sheep in the Kimberley and Pilbara regions.

- Pastoralists, livestock agents, stockmen, auction/sale yard staff, road transport agents, fodder and water suppliers, and veterinary services are the other main parties in this sector.

Processing/Wholesale

- Unlike the situation for cattle, the sheep feedlot sector tends to be more seasonal and ad hoc in nature. Hence, most sheep come directly from farms into the processing/wholesale sector that consists of four major sub-sectors; live sheep exporters, export abattoirs, domestic abattoirs, and wholesalers. In 2009/10 live export accounted for 2.15 million head (37%). Export abattoir received 2.14 million head (36.84%), domestic abattoirs received 1.37 million head (23.56%) for processing and the rest, 0.15 million head (2.6%), were transported interstate.
- The main other businesses involved in the processing sector are road transport (auction/farm to abattoir, abattoir to retailers), packaging services, and by-product exporters.

Retailing/Export

- The sheep and sheep meat export markets for WA can be divided into four main destinations: 'Middle East', 'Taiwan', 'United States of America (USA)', and 'Other regions'. In 2009-10 live exports of 1.99 million head (93%) went to Middle Eastern countries. Kuwait, Qatar, Jordan, Saudi Arabia and Bahrain were the largest destinations, accounting for 26%, 18%, 16%, 14% and 13% respectively. The rest of the live sheep, 0.15 million head (7%) went to other overseas countries.
- The main export market for sheep meat is the Middle East where 15,852cwt (36%) were sent. Exports to Taiwan and USA were similar in share, 3,610cwt (8.4%) and 3,598cwt (8.2%) respectively. The rest of the export meat (47.4%) went to other countries.
- Most meat and meat products from domestic abattoirs are transported to supermarkets by their own cold transport systems. The remaining portion is packaged and transported by wholesalers to the retail butchers, restaurants and some other supermarkets.
- Hides and other by-products went to tanneries and other by-product exporters and retailers from both domestic and export abattoirs.
- Approximately 80,000 tonnes of wool was produced from the 14.5 million sheep (4.2kg/hd greasy) in WA in 2009/10.
- Similar to the beef-cattle industry a large number of businesses are involved in the sheep and sheep meat export sector. For live sheep export: livestock agents, transporters, veterinary service providers, pre-export assembly service providers at port area, fodder manufacturers, growers and retailers, shearing contractors, port authorities, stevedores and provedores, ship agents, ship owners, government agencies (AQIS, AMSA), and auditing and accounting service providers are involved. Additionally the meat export sector includes packaging services, quarantine services, export agents, and involvement of government agencies.

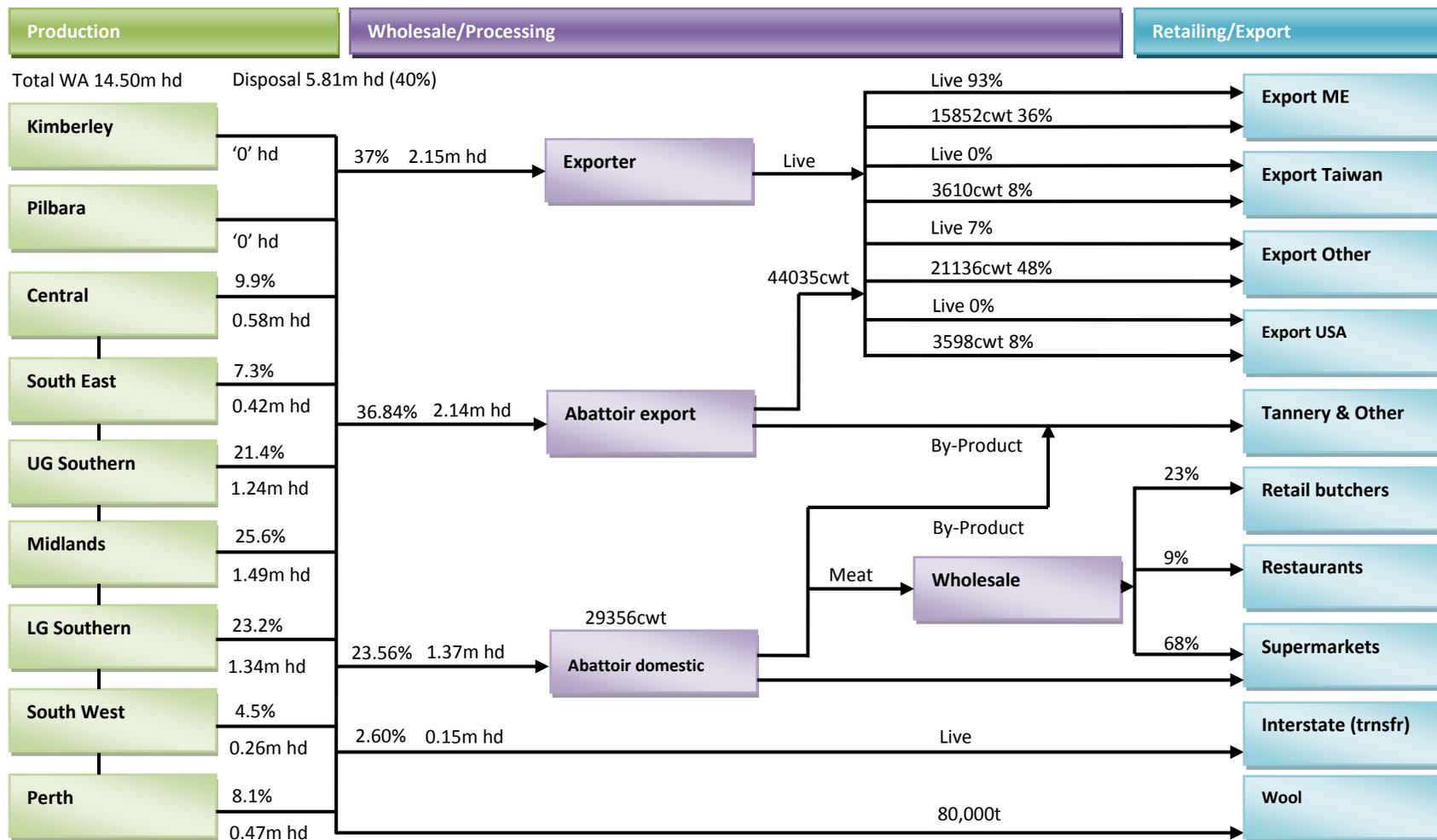


Figure 13: The WA sheep value chain in 2009/10

Goat supply chain

- The goat supply chain also comprises three main sectors; Production, Processing/Wholesale and Retail/Export (Figure 14).

Production

- WA produced 85,680 head of goats in 2009/10 for disposal. Most of the goats are produced in the rangelands. Pastoralists, livestock agents, road transport agents, fodder and water suppliers, and veterinary services are the other main parties in this sector.

Processing/Wholesale

- The processing and wholesale sector comprises four major sub-sectors; live goat exporters, export abattoirs, domestic abattoirs, and wholesalers. Out of total WA slaughter, export abattoir received 73,894 head (95%) and the rest 3,890 head (5%) was processed by domestic abattoir for domestic consumption.
- The main other businesses involved in the processing/wholesale sector are road transport (farm to abattoir, abattoir to wholesalers and retailers), packaging services, and by-product exporters.

Retailing/Export

- The main export markets for WA goat can be divided into four major destinations; Malaysia, Singapore, Saudi Arabia and other regions. A total of 7,896 head of live goats were exported to these destinations in 2010 which is approximately 46% less than the previous year. Almost all of the goats exported live from WA are transported by air.
- The other involved businesses in this sector are livestock agents, transporters, veterinary service providers, pre-export assembly service providers, fodder manufacturers, growers and retailers, airport authorities, provedores, aircraft agents, aircraft owners, government agencies (AQIS, AMSA), and auditing and accounting service providers. Additionally the meat export sector includes packaging services, quarantine services, export agents and involvement of government agencies.

Ramifications of a Cessation in the Live Cattle Trade

Vulnerable businesses and regions in WA

The primary impact of a cessation of live cattle export will be on cattle producers in regions highly dependent on the live export trade. This impact will probably be greatest on producers in the Kimberley who are almost entirely dependent on this trade, with 73% of cattle sales over the past ten years being to the live export trade.

Each pastoral or farm business will experience varying levels of impact, dependent on the structure of their business, the size of their herd, the development status of the business, and the extent of their non-farm income and assets.

Generally, pastoralists in the north of the state have less opportunity to diversify out of the live export trade and subsequently would experience greater adverse impact from the cessation than beef farmers in the south of the state whose properties can more easily switch to alternate enterprises.

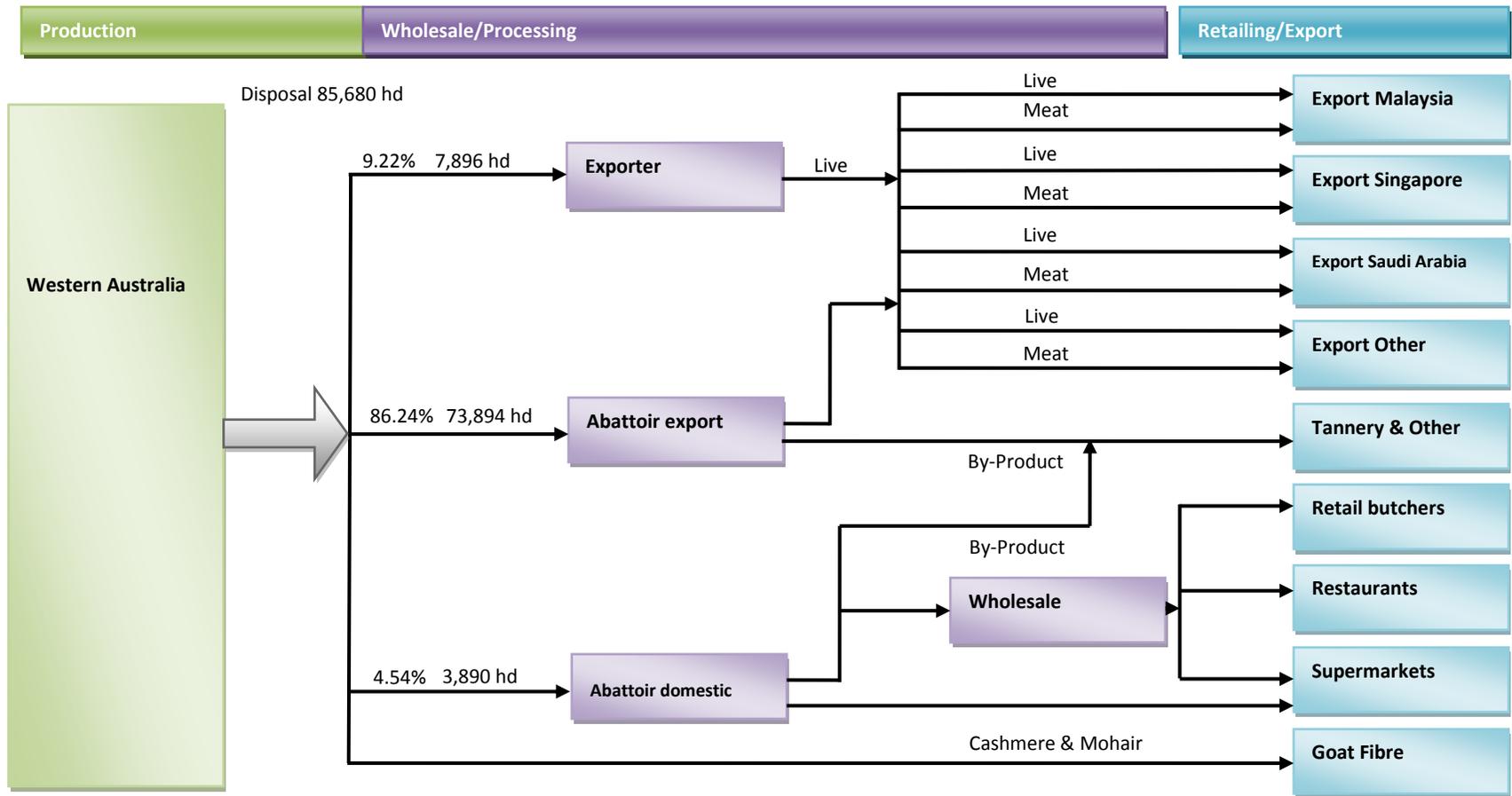


Figure 14: The WA goat value chain in 2009/10

Pastoralists, particularly those in remote regions, can expect lower returns on their cattle sold to a domestic market. The reduction in returns is due to a lower price per kilogram that the pastoral cattle receive on the local market and an increase in transport costs as cattle are transported longer distances for further backgrounding or entry into feedlots. CIE (2011) suggest that the Australian average price discount may be in the region of 7.8c/kg liveweight or \$27.30 per 350kg steer; however estimates in WA are that these would be significantly higher, with reductions up to \$0.40 per kg being forecast (Peggs, *pers. comm.*). A 350kg steer that previously would have been exported live from Broome would now additionally cost \$115 to transport to the Perth region.

In order to manage the effects of a cessation of the live trade, pastoralists and farmers may consider reducing expenditure in the short term to manage cash flow; however these actions would have long term consequences for their businesses. Examples include deferring decisions on maintenance and replacement of plant and equipment, replacement of stock water infrastructure, fence and yard maintenance and bull purchases. These deferrals may result in higher costs in the future as infrastructure may deteriorate to the extent where it can no longer be repaired and subsequently will need to be completely replaced. The impact on the suppliers of these services would also be felt in the regions. In the weeks immediately following the announced suspension of the live trade with Indonesia in June, the anecdotal evidence was that pastoral businesses were revising budgets and deleting all non-essential capital expenditure until the trade resumed.

Pastoralists (depending on their cash flow situation and access to finance) were considering reducing expenditure on items such as licks and supplements, mustering, reducing use of veterinary services for animal health issues and reducing the workforce by letting non-essential staff go. Each of these decisions was likely to impact on local businesses that provide these goods and services to the live export industry, with the level of impact depending on the percentage of income derived from this source (see Table 7).

Table 7: Participants in the live cattle export trade

<i>Value chain participant/ancillary service provider</i>	<i>Turnover earned from live export (%)</i>
Exporters	>80%
Assembly depot operators	>80
Marine consultants	>80
Ship owners	>80
Ship agents	>80
On-vessel stockmen	>80
Road transport providers	50 – 80
Livestock agents	50 – 80
Veterinary service providers	50 – 80
Port authorities	50 – 80
Stevedores	50 – 80
Rural contractors – mustering, fencing, etc	10 – 50
Rural consultants and trainers	10 – 50
Fodder growers and manufacturers	10 – 50
Industry associations	10 – 50
Providores	10 – 50
Regional businesses	<10
Government service providers	<10
Rural finance, auditing, insurance and legal service providers	<10

Source: AgEconPlus (2007)

The percentage turnover that businesses in WA derive from the live export trade varies from region to region and is dependent on the level of importance of the trade in the region relative to other industries. For example businesses in the Kimberley are more reliant on the live export trade whilst in the Pilbara businesses derive a higher proportion of their income from other sources. The major regions that derive significant income from the live export trade are considered below in relation to the impacts.

Kimberley

An average of 144,212 cattle were exported annually from the Kimberley between 2005 and 2009 (CIE, 2011). Approximately 73% of the cattle turned off in the Kimberley in the last ten years have been exported live, with the balance being sent to abattoirs and other domestic markets.

The main live export ports that support the Kimberley live cattle industry are Wyndham and Broome; however cattle from the east Kimberley are also exported through Darwin. The majority of the export cattle are Brahman or Brahman cross animals supplied to the Indonesian market. Cattle are also sent south and east for the domestic market but this only makes up 27% of the sales.

With the suspension of the Indonesian market, there is local evidence that orders for cattle have been cancelled. One example of this is the recent cancellation of an order for 8,000 pastoral cows after mustering at substantial cost.

There are an estimated 69 pastoral businesses in the Kimberley which operate the 94 pastoral leases (DAFWA, 2011). With a farm gate value of \$585 per head (CIE, 2011) then the total value of exports at farm gate value is in the region of \$97.8 million or \$1.42 million per business.

Aside from pastoral businesses, the following associated businesses derive more than 70% of their turnover from the live export trade and will subsequently be significantly impacted by the cessation of the live export trade:

- Mustering contractors
- Helicopter contractors for mustering
- Road transport of sale cattle to depots near ports and for paddock carting
- Suppliers of hay and pellets to both export yards and live cattle ships
- Export yards and depots
- Casual labour employed in ports for loading cattle ships
- Live cattle vessels – crews, demand for supplies and fuel oil, return on assets as few alternative business opportunities for specialised shipping
- Fencing contractors – pastoralists are deferring decisions to develop infrastructure
- Stock and station agents supplying fencing materials and husbandry supplies and who may also have exposure to lending to pastoral businesses

The impact on the following businesses in the Kimberley is considered to be moderate:

- General freight companies supplying pastoral stations with various inputs
- Suppliers of hay for station livestock practices such as weaning and yarding
- Independent vets assessing loading operations and stock inspections
- Shops and retail businesses in regional centres
- Fuel suppliers to pastoral stations - diesel is required for power generation, pumping from bores and for plant and vehicle use
- Livestock port staff, harbour pilots and port infrastructure (reduction of live export ships utilising ports)

- Bull producers with markets in northern Australia

There will be a low impact on the following activities and businesses: agricultural shows; rodeos in regional centres; building and construction companies; earth moving/grading contractors for roads and dam building; drilling operators; many small businesses that service the pastoral community for food, clothing, saddlery, LPG cylinders and general supplies; vehicle and truck dealerships including the supply of spare parts; pump and motorbike suppliers; irrigation businesses and metal suppliers.

Anecdotal evidence from the Kimberley suggests that if permanent closure of the live trade with Indonesia occurred then:

- A local hay producer for pastoral leases and export yards was expecting to lose over \$1 million in sales
- A local car dealership was forecasting lost vehicle and spare parts sales of \$0.5-1.5 million in 2011
- A local saddlery supplier was expecting a loss of 20% in annual turnover if rodeos and shows became poorly attended by pastoralists

Pilbara

An average of 35,409 cattle were exported annually from the Pilbara between 2000 and 2009. Approximately 46% of the cattle turned off in the Pilbara in the same period were exported live, with the balance being sent to abattoirs and other domestic markets. It is important to note that a greater proportion of the cattle were sent to abattoirs (15%) and other markets (39%) than was the case in the Kimberley where a comparative total of only 27% were sent to other markets. This is due to the closer proximity of the Pilbara to markets in the south and emphasises this region's lesser dependence on live exports.

The Pilbara's agricultural production is dominated by the cattle industry, with 97% coming from livestock disposals (Pilbara Development Commission). According to Alan Peggs (*pers. comm.*), a specialist beef enterprise adviser, the 'typical' station comprises 200,000 ha and runs 2,650 Brahman cross breeders mated with Brahman and Droughtmaster bulls. It achieves a branding rate of 75%, retains all weaners on the property and markets them as live export steers and heifers at around 18 months of age at 325 and 305 kg liveweight respectively. These are marketed to Indonesia through Port Hedland. Cull cows and bulls are marketed at the Muchea saleyards in the south of WA.

Peggs estimates that the effects of a cessation of live trade with Indonesia would result in a 'typical' station having its return on investment reduced by 66% from 4.4% with trade to 1.5% without trade.

There are an estimated 51 pastoral businesses in the Kimberley which operate the 64 pastoral leases (DAFWA, 2011). With an estimated farm gate value of \$585 per head (CIE, 2011) then the total value of exports at farm gate value is in the region of \$20.7 million or \$0.4 million per business.

As with the Kimberley, there will be other businesses in the region that would be impacted by a cessation of the live trade, however due to the lower level of livestock activity in the Pilbara, combined with the substantial activities of the mining industry, the impacts would be less than in the Kimberley.

The following businesses may be significantly impacted by the cessation of the live export trade as they are likely to derive more than 70% of their turnover from the trade:

- Mustering contractors
- Helicopter and fixed wing contractors for mustering
- Road transport of sale cattle to depots near ports and for paddock carting
- Suppliers of hay and pellets to both export yards and live cattle ships
- Export yards and depots
- Casual labour employed in ports for loading cattle ships
- Live cattle vessels – crews, demand for supplies and fuel oil, return on assets will be reduced as there are few alternative business opportunities for such specialised shipping
- Fencing contractors – pastoralists are deferring decisions to develop infrastructure
- Stock and station agents supplying fencing materials and husbandry supplies and who may also have exposure to lending to pastoral businesses

The impact on the following businesses in the Pilbara is considered to be moderate to low:

- General freight companies supplying pastoral stations with various inputs
- Suppliers of hay for station livestock practices such as weaning and yarding
- Independent vets assessing loading operations and stock inspections
- Fuel suppliers to pastoral stations - diesel is required for power generation, pumping from bores and for plant and vehicle use
- Livestock port staff, harbour pilots and port infrastructure (reduction of live export ships utilising ports)
- Irrigation businesses
- Bull producers

Many of the businesses that would be adversely affected by the cessation in the Kimberley such as drilling contractors, earthmoving contractors, vehicle retailer, and the like will be less affected in the Pilbara due to the strength of the mining industry in this region.

Gascoyne, Murchison and Goldfields

These regions are again less dependent on the live export trade than the Kimberley or the Pilbara due to their closer proximity to the southern saleyard markets and the agricultural area for backgrounding and feedlotting. Thirty five percent of the cattle sales from the Gascoyne and 22% of the cattle sales from the Murchison were exported live, with the balance sent to other markets. In addition to the fact that there are proportionally less cattle exported live, the number of cattle produced in this region is also considerably less than in the Kimberley and to a lesser extent in the Pilbara. Thus it is suggested that the impact on businesses in these regions would be less significant than in other regions highly dependent on the live export trade.

WA's agricultural region

This is the region which would be least affected by a cessation of live export of cattle as there is a greater level of diversification in the region, both in terms of farm enterprises as well as the market opportunities for producers.

When the recent suspension of the live cattle export trade with Indonesia occurred, investigations by DAFWA indicated that the livestock support industries (e.g. Elders, Landmark, Milne Feeds, etc) were reporting 'business as usual' with mostly a shift in attitude and sentiment rather than the experiencing of financial imposts on their businesses. Processors reported no change, although they noted some improvement in the saleyards (as opposed to previous years) of consistent/uniform quality. The cause was attributed to the lower number of live exporters mustering, and their selecting animals in uniform saleable condition to deliver onto the market.

Most southern processors in WA presently have room to increase supplies to the manufacturing beef market. A best estimate would be around 1,250 to 1,750 head per week dependent on price/suitability. This is however less than the annual average of exports from the port of Broome alone (87,700 head), and substantially less than the average weekly exports from Broome at peak season from May to October.

Throughout the recent trade suspension most financial institutions endeavoured to assist producers directly affected by the suspension; however if a permanent cessation of the live export of cattle occurred then many producers would rapidly experience financial difficulty and the response of banks would be different.

The following two live cattle trade scenarios are considered, based on the value chain models in Figures 14 and 16. Key aspects of the scenarios are:

Scenario-I: Export ban to Indonesia for a short period

- Live export suspension to Indonesia is assumed to affect 110,000hd cattle (of these, 51,171hd are from the Kimberley, 23,143hd from the Pilbara and the rest, 35,686hd are from other regions in WA). Of these cattle 80,000hd are assumed to be exported live to Indonesia in 2011, following resumption of the trade. The remainder are assumed to move interstate or to feedlots within WA.
- Most cattle are assumed to remain on the range for fattening until August. When cattle are sold to the live export trade, following the resumption of the trade, their price is assumed to be 10% less due to a few factors such as greater competition between pastoralists and higher compliance and monitoring costs that are passed back to pastoralists. The 30,000hd of cattle moved interstate, to other regions or to feedlots, are assumed to also receive a lower price (by 10%) and to incur higher transport costs (treble the road transport cost associated with live export). Because the export trade to Indonesia is assumed to resume fairly rapidly with export volumes recovering, the final meat price for exports and domestic retail sales is assumed to be unchanged.

Scenario-II: On-going ban on all live cattle exports

- Pastoral cattle are assumed to remain on rangelands for fattening, until mustering occurs late in the dry season. Then cattle are assumed to move interstate or to feedlots within WA. The loss of the live export market forces all cattle, whether pastoral or agricultural cattle, to be processed through Australian abattoirs. National competition among beef producers for sale of their cattle that now can only be processed in Australia is assumed to cause a 10% reduction in the sale price received by WA beef farmers. Furthermore, because pastoral beef now need to be transported further within Australia than previously occurred under live export, the cost of transport is assumed to treble.
- The loss of all live cattle export markets is also assumed to cause a 5% decline in the WA domestic meat price due to the greater volume of meat becoming available for sale on its domestic market. Many pastoralists are assumed not to have alternative more profitable enterprises to turn to and so they continue to supply similar volumes of beef cattle, in spite of their reduced enterprise profitability.

Simulation results

The annual baseline economic measures of the WA beef-cattle industry value chain in 2009/10 are summarised in Figure 15 for the three broad supply chain groups: Farms/production, Wholesale/Processing and Retailing/Exports.

The resulting effects of Scenarios I and II are illustrated in Figure 16 and the numeric estimates of both the base case and scenarios I and II are presented in Table 8.

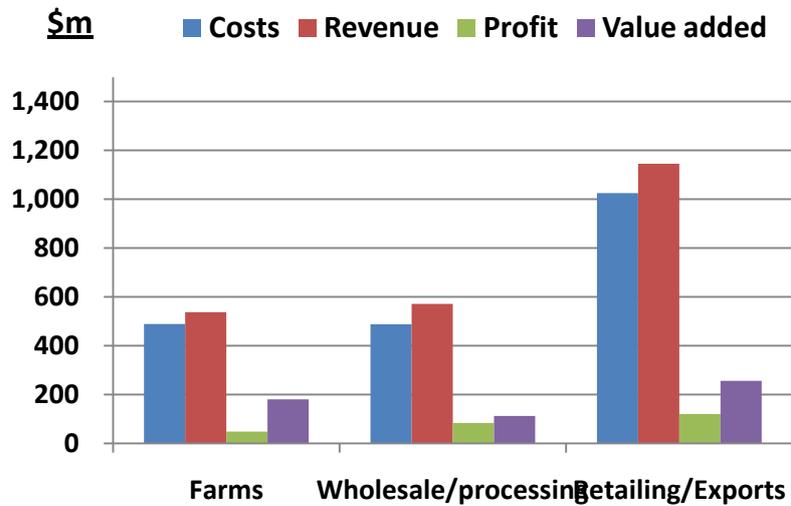


Figure 15: Base supply chain values in the WA beef cattle industry, 2009/10

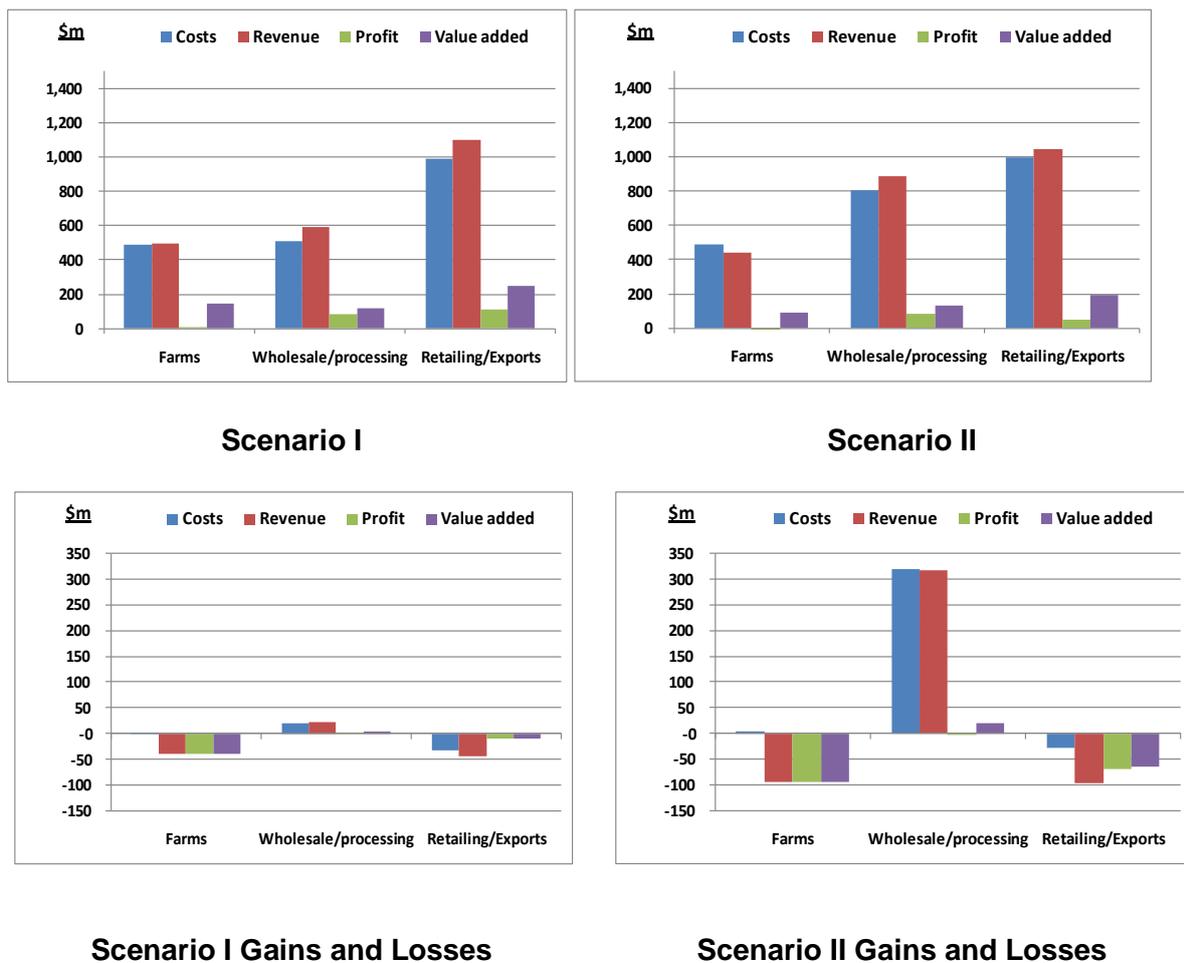


Figure 16: Effect of scenarios I and II on the WA beef cattle industry supply chain

In scenario I farm profit declines due principally to farmers receiving a lower price for cattle they produce, plus they pay higher transport costs when selling a portion of their cattle to other regions. Profit in the retail/export sector also is reduced, principally due to loss of export income as the number of cattle exported is less in 2012. However, wholesale and processing profit and revenue increase due to greater throughput, in spite of their increased production costs due to the purchase and processing of more animals.

In Scenario II all three main parts of the beef cattle supply chain experience a decline in their profit and value adding capability. The retail/exporting sector suffers from a permanent loss of income from live cattle exports, plus lower retail prices affect revenues and profits. Increased transport costs and lower sale prices disadvantage farmers. In this scenario the processors are hardly affected. They purchase more cattle at lesser unit prices and benefit from higher volumes of throughput.

Table 8: Supply chain values of the WA beef cattle industry (live export ban)

	Farms	Wholesale/ Processing	Retailing/ Exports
<u>Base Value(\$m)</u>			
Costs	488.5	487.2	1,025.1
Revenue	537.1	571.6	1,145.9
Profit	48.6	84.4	120.8
Value added	181.2	112.5	256.9
<u>Effects of Simulation I(\$m)</u>			
Costs	489.9	507.5	991.4
Revenue	498.4	593.5	1,102.3
Profit	9.9	86.0	110.9
Value added	142.5	115.4	247.2
<u>Gains and losses from Simulation I(\$m)</u>			
Costs	1.37	20.3	-33.7
Revenue	-38.7	21.92	-43.6
Profit	-38.7	1.63	-9.9
Value added	-38.7	2.90	-9.7
<u>Effects of Simulation II(\$m)</u>			
Costs	491.7	805.9	997.3
Revenue	442.7	890.1	1,048.5
Profit	-45.8	84.2	51.3
Value added	86.9	132.6	191.5
<u>Gains and losses from Simulation II(\$m)</u>			
Costs	3.1	318.7	-27.8
Revenue	-94.8	318.5	-97.4
Profit	-94.8	-0.2	-69.6
Value added	-94.8	20.1	-65.4

Ramifications of a Cessation in the Live Sheep Trade

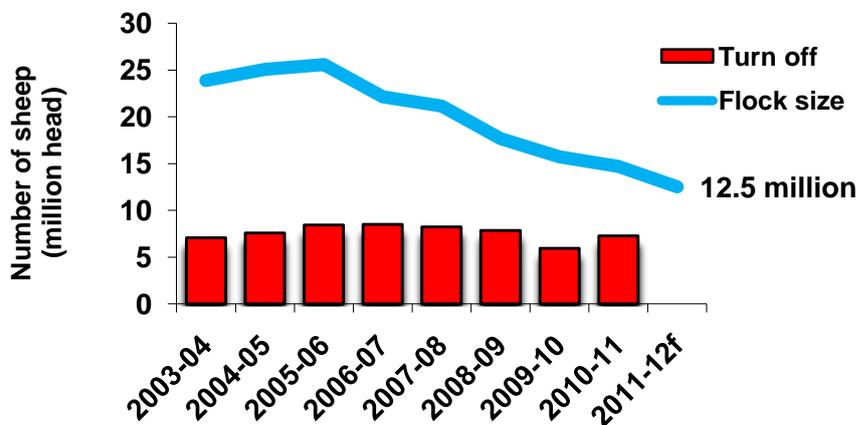
Ramifications for WA farmers

A disruption or termination of the trade would have an immediate impact by shifting the supply of animals normally destined for live export on to domestic markets, via abattoirs, or additional animals would be retained on farm for more years of wool production. The reduced competition for purchasing sheep would place downward pressure on the sheep prices, therefore reducing margins for producers whilst improving margins for processors, at least in the short and medium term.

Sheep numbers in WA would probably decline further in response to lower prices. However the response by industry participants depends on a number of factors; the alternative options for producers would have to yield more profits than the margins generated by sheep production. The regions in WA most vulnerable to the cessation of the live sheep trade are the Great Southern region (lower and upper) and the Midland region. These regions are medium to high rainfall areas, where the reliance on sheep income is higher because only 40% to 60% of farm area, on average, is cropped compared to the Central and South Eastern regions, where 70% or more of farm area is cropped.

In recent years there has already been a significant structural change within the sheep sector and sheep numbers have declined significantly largely due to the relative profitability of other enterprises and declining wool prices, all compounded by drought. Figure 17 shows how sheep numbers in WA have declined greatly in recent years and the forecast flock size for 2011/12 is only 12.5 million.

Figure 17: Changes in WA's sheep population



Associated with the reduction in the sheep population has been conversion of land to cropping. Further conversion is possible. However, land suitability constraints, when combined with the likelihood that additional cropping can increase the risk profile of a farm business (due to highly variable yields and prices, and capital requirements), suggest that a rapid switch of farm resources into extreme crop dominance is unlikely.

A better understanding of producer's decision-making in the event of a disruption or termination of the trade can be gained by examining the current profitability of the live sheep trade in comparison to other enterprises, cropping being the most likely.

Figure 18 compares current gross margins for low rainfall and medium/high rainfall enterprises with and without the live sheep trade. It shows a medium/high rainfall enterprise

gross margin for a wool enterprise is \$317/ha and \$302/ha for a prime lamb enterprise with current prices for shippers and wool. The gross margin without the live sheep trade, assuming prices for all classes of sheep decline, reduces to \$237/ha and \$214/ha respectively.

Most studies forecast that any termination of the live sheep export trade will reduce prices received by farmers for sheep, principally due to less market competition. By illustration if shipper wether prices were to fall by \$30 from their current farm-gate price of around \$90, and there was a corresponding proportional fall in other sheep prices, then gross margins would decrease by at least 25%. If the farmer maintained their investment in their sheep enterprise then their farm's operating surplus would reduce by 10%, which means there would be 10% less funds to meet interest payments, to invest in the farm business, to meet capital repayments and pay for personal living expenses.

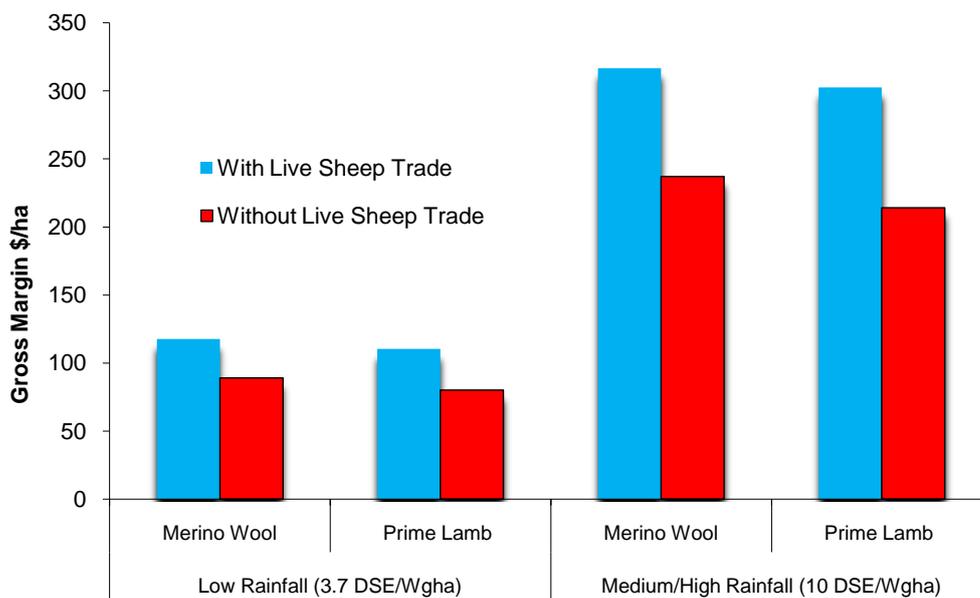


Figure 18: Gross margins for sheep enterprises in WA

In the low rainfall areas the gross margin for a wool enterprise is \$118/ha and \$114/ha for a prime lamb enterprise, with current prices for shippers and wool. The gross margin without the live sheep trade, assuming prices for all classes of sheep decline, reduces to \$89/ha and \$80/ha respectively.

In the corresponding rainfall areas the PlanFarm-Bankwest Benchmarks 2009, overhead costs are \$53/ha for the medium/high rainfall and \$39/ha for the low rainfall and which have to be paid from this margin. Therefore the operating surplus which is required to pay for interest, invest in the business, meet capital repayments and pay for personal living expenses is only \$50/ha or \$41/ha in the low rainfall areas and \$264/ha and \$249/ha, respectively in the medium and high rainfall areas.

For a producer the decision becomes whether alternative enterprises provide a better net margin. Table 9 lists gross margins for alternative crop enterprises with current prices and average yields.

Table 9: Gross margins (\$/ha) for crops for 2010/11

Gross Margin (\$/ha)	Wheat	Malt Barley	Feed Barley	Canola
Medium/High Rainfall	452	422	410	544
Low Rainfall	158	140	149	46

The cropping alternatives display higher gross margins than sheep enterprises either with or without the live sheep trade. The sheep gross margins in Table 6 include the recent increase in the wool price, currently at an all time high. The greater margins for cropping suggest that any suspension or cessation of the live sheep trade will reinforce the incentive many farmers already face in switching more resources into cropping and therefore any cessation of the live sheep export trade may be less damaging if the farmer has the skill and capital to switch into more cropping.

Further analysis reveals that the live sheep trade contributes 18% and 21% of the gross receipts for a prime lamb enterprise and wool enterprise respectively, as shown in Figure 19 for both rainfall areas.

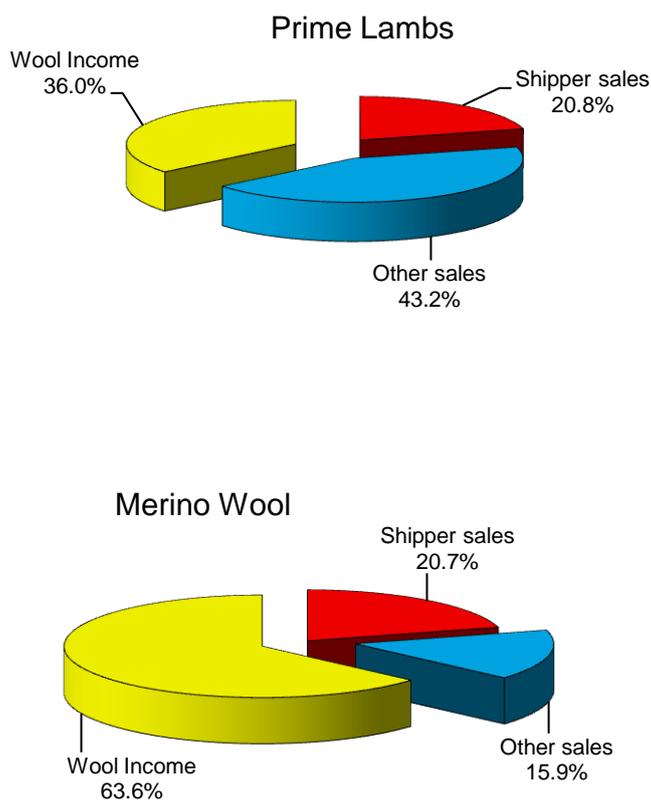


Figure 19: Income sources for the prime lamb and wool enterprises in WA (by %)

The price of wool has more impact on the gross margins because it contributes 63% to the gross receipts of wool dominated enterprise and 41% to a prime lamb enterprise using merino ewes. Currently the price of wool is at an historic high. Although it is difficult to

predict the movement in the wool price, it seems unlikely, given historical data, that the price of wool will be maintained indefinitely at such a high level. Therefore, if the live sheep trade is disrupted or terminated, the impact would be less than a decrease in the price of wool, but if both happened simultaneously then the sheep industry would be severely affected and numbers would continue to decline.

Studies by O'Connell et al. (2006) and Kopke et al. (2008) show that profit-maximising flock structures in WA's mixed enterprise farming systems in agricultural regions, up until recently when wool prices surged, very often were best structured toward lamb production rather than shipping wether production. These findings suggested that WA farmers would not be disadvantaged by a reduction in or cessation of the live sheep export trade. However, there are a number of sound reasons, apart from currently high wool prices, why broadacre farmers (particularly crop specialists) remain in wether production and so will be disadvantaged to any reduction in the export trade.

Firstly, seasonal variation can exacerbate management problems in ewe dominant flocks that focus on lamb production. Drought or poor spring conditions can greatly impact on the ease and cost of finishing lambs. By contrast, wethers can be maintained more easily and their window of opportunity for sale is much longer compared to lambs. Shipping wethers can be sold when they are between 18 months to 3 years of age. By contrast, a lamb's window of opportunity for sale as prime lamb is fairly narrow, limited to a few months. Further, prime lamb production often needs to be a specialist enterprise whereas for many broadacre farmers shipping wether sheep production is a sideline enterprise with cropping being their main management focus.

To generate the superior profits from lamb production often requires a level of managerial time and skill that crop dominant farmers may be unable or unprepared to give (Kingwell, 2011). Accordingly, these farmers prefer a sheep enterprise that is simple and flexible to run, yet which generates reasonable profits. Production of shipping wethers suits these farmers' needs, even though a flock structure more oriented to lamb production might generate more profit. The fact that Western Australian farmers have regularly annually supplied between 2.5 to 4.5 million shippers wethers over the past decade, and the fact that shipping wether production has consistently formed the main component of annual total turnoff of sheep, is evidence of farmers' strong preference for shipping wether production.

Another reason why some farmers prefer to produce shipping wethers is the price certainty they receive. By contrast, when lambs are delivered to processors there is some uncertainty as to whether all the lambs will meet the processors' specification requirements. The final price the farmer receives for her lambs is conditional on the level and frequency of price discounts applied to the farmer's draft of lambs following their processing. This price uncertainty reduces the attractiveness of lamb production to some farmers. Some farmers also distrust processors because they feel, from historical experience, that the processors have taken undue advantage of them when previous disruptions of the live sheep trade occurred.

Hence, although until recently, some farmers may have been able to generate additional profit by moving into lamb production, rather than continuing with shipping wether production, the reality is that many farmers are keen to persist with shipping wether production. If the wool price was to fall, triggering some farmers to alter their flock structures to engage in more lamb production at the expense of shipping wether production, then there would be a dampening of lamb prices and some additional support for shipping wether prices (assumed the export trade is permissible) which in combination would lessen the attractiveness of the change in flock structure.

The forecasts for reasonable market prospects for lamb and mutton and the current high price for wool, and the current under-utilisation of processing capacity in WA, suggest that a reduction in live sheep trade may not in the short and medium term markedly lessen the profitability of many farm businesses in WA. Farm businesses currently engaged in shipping wether production rather than lamb production could switch into wool or lamb production (even allowing for a lowering of lamb prices) and still generate similar profit. How this switch occurs and the degree to which it would occur are farm-specific issues. For example, one option would be for enhanced synergies between farm businesses where some farms could focus on breeding lambs but not finishing them. The finishing of lambs could become the business focus for other farms in higher rainfall, longer growing season regions.

If permanent or gradual cessation in the live sheep trade occurs then businesses already focused on lamb production, however, would face lower profits due to a likely reduction in lamb prices, due in turn to a switch of sheep industry resources into lamb production and reduced demand for ram lambs and other older sheep from live sheep exporters. Also where farm businesses were greatly tied to the live sheep trade then their costs of adjustment could be sufficiently high to erode profits during any transition period.

Farms with flock structures centred on production of shipping wethers could adjust toward more lamb production or focus on wool and mutton production or shift resources further into cropping enterprises. Farm modeling results show that a farm can adjust its enterprise mix away from sheep production (if the relative profitability of sheep production declines) often with little overall decline in farm profit (Kopke *et al.* 2003), provided the transition does not involve large capital purchases such as additional cropping gear or unforeseen large adjustment problems.

Farmers often alter their enterprise mix and management practices in response to market, seasonal and technology changes. Hence, if farmers do need to alter their farm management in response to a reduction in or cessation of the live sheep trade they will not be undertaking novel, risky activity. Obviously, the smaller and more gradual any reduction in live sheep trade, the easier it is for a farm business to accommodate through farm planning and transition management.

Overall, the farms currently most vulnerable to a cessation or gradual erosion of the live sheep export trade will be sheep dominant farms with little capacity or appetite to switch away from sheep production into more profitable cropping enterprises. Also farms that face high transition costs will be disadvantaged.

Ramifications for WA sheepmeat processors

While live exports provide substantial benefits to exporters and their suppliers it does reduce incomes to processors by increasing livestock prices and reducing throughput levels (CIE, 2011). The CIE study found that the GVP for sheep for processors increases by \$38 million when live sheep export is terminated.

In WA, the two main abattoirs that process sheepmeat are Fletchers International at Narrikup and WAMMCO at Katanning. They have significant export markets, good infrastructure and modern facilities. WAMMCO recently won awards for its robotic boning and packing facilities.

Based on 2009 data there could be an additional 2.2 million sheep to process in WA, if the live sheep trade were to be terminated now. Currently most processing plants are under-utilised due to the shortage of sheep and there is additional capacity in the system to process at least 1,830,000 more sheep (see Table 10). WAMMCO could possibly increase

their capacity with a second shift but chilling facilities for the additional carcasses might be a constraint for other facilities.

Table 10: Estimated capacity of WA abattoirs to kill sheep⁴

	Capacity Units/wk	Current rate of kill	Estimated current numbers	Estimated spare capacity
Fletchers (Narikup)	45,000	50%	22,500	22,500
WAMMCO (Katanning)	20,000	71%	14,200	5,800
V&V Walsh (Bunbury)	17,500	70%	12,250	5,250
Shark Lake (Esperance)	6,000	50%	3,000	3,000
Goodchild (Australind)	5,000	70%	3,500	1,500
Hillside (Narogin)	Unknown			
			55,450	38,050
			Number of animals (ABS)	3,510,00
			Difference between (ABS)	848,400

An understanding of the costs and margins involved for processors can be estimated using information DAFWA economists collected when visiting Fletchers International in 2010. The cost of production is estimated to be \$40/head at a throughput of 25,000 head per week. At full capacity this cost of production reduces to \$22/hd per week. If the gross income is \$100/hd per animal, which is probably relatively conservative considering additional income from by products, the margin increases from \$1.5 million to \$3.5 million with the additional throughput.

The implications for processors if the trade were to cease is that they would become more profitable with more sheep to slaughter, assuming there is a market for the product in the frozen or chilled product. However, in the medium to long term the reduced profitability of sheep production in the farm sector would decrease numbers of sheep further and processors could be in a worse position than they currently find themselves.

Economy-wide impacts

The economy-wide CGE model for WA, called WAM, was applied to investigate the impact of a reduction in live sheep exports. The model accounts for interdependencies among agricultural and other industries in WA. The WAM database draws on an input-output table for WA. The input-output table has 108 industries and as many commodities.

Table 11 shows the macroeconomic effects of a reduction in the export of live sheep. As might be expected, the economy-wide impacts are relatively minor, causing small percentage changes in the state's gross state product (GSP), employment, export values and the CPI. Hence, the main impacts of any reduction or cessation in the export of live sheep are likely to be felt most strongly within the sheep supply chain as depicted in Figures

⁴ These figures are based on information provided by the abattoirs

10 and 16 rather than across a wider group of sectors or more generally throughout the economy.

Sheep that previously would have been exported live would now flow through the meat processing sector. The ramifications would be lower domestic prices for sheepmeat and consequently a slight lessening of the CPI and a slight lessening of export revenues as more sheep meat would be consumed within Australia. As also found by CIE (2011) the sheep meat processing sector would be a principal beneficiary of any cessation in live sheep exports. The domestic meat processing sector benefits from the expansion of its activity, yet more supply of sheep meat to the domestic market causes the sheep meat price to decline.

These findings are consistent with those of CIE (2011) who found that on average across Australia, lamb and mutton prices would decline by 12 and 15 percent respectively if a cessation of live exports occurred.

Table 11: Macroeconomic impacts of 10, 20 and 30 percent reductions in live sheep exports from WA (percent change)

Macro-economic variables	Simulation:		
	Percentage decline in volume of live sheep exports		
	10%↓	20%↓	30%↓
GSP at market price	-0.03	-0.01	0.02
Total consumption (real)	-0.06	-0.07	0.08
Consumers Price Index (CPI)	-0.03	-0.03	-0.04
Aggregate employment	-0.06	-0.12	-0.18
Total imports	0.00	0.01	0.03
Total exports	-0.07	-0.18	-0.29

However, the economy-wide impacts in Table 8 mask important regional economy impacts. Regions such as the northern beef industry of WA, that are strongly reliant on the live export trade and where few similarly profitable alternative enterprises exist, will experience large regional economic costs following cessation of the live trade. Hence, these regions would face large adjustment costs and greatly diminished profits from pastoral beef production.

Any reduction or cessation of the live trade in cattle or sheep is liable to impose significant adjustment costs on particular farm and pastoral businesses in particular regions. The recent experience with the trade suspension involving live cattle sent to Indonesia revealed the sorts of economic disadvantage that trade cessation can unleash. It revealed the magnitude of costs and adjustment issues that would accompany trade reductions and cessations of the live trade.

References

CIE (2011) The contribution of the Australian live export industry, Prepared for LiveCorp and Meat and Livestock Australia, Centre for International Economics, Canberra & Sydney, March, 2011, pp. 75.

- Drum, F and Gunning-Trant, C 2008, Live animal exports: a profile of the Australian industry, ABARE Report 08.1.
- Hassall and Associates (2000) Economic contribution of the livestock export industry, Final report prepared for Meat & Livestock Australia, pp.76, ISBN 1 74036 534 8.
- Indigenous Land Corporation (2010) ILC Annual Report 2009-10, Adelaide.
- Keniry, J. (chair), Rogers, W., Caple, I., Bond, M. and Gosse, L. (2003) Livestock Export Review: Final Report. A Report to the Minister for Agriculture, Fisheries and Forestry. Available at http://www.daff.gov.au/__data/assets/pdf_file/0008/146708/keniry_review_jan_04.pdf
- Kingwell, R. (2011) Managing complexity in modern farming. *Australian Journal of Agricultural and Resource Economics* 55: 12-34.
- Kopke, E., Young, J. and Kingwell, R. (2003) Profitability of sheep systems in W.A.'s South Coast for various commodity price scenarios, Paper prepared for Sheep Updates 2003 Conference, August 12-13, Hyatt Regency Hotel, Perth
- Kopke, E., Young, J. and Kingwell, R. (2008) The relative profitability of different sheep systems in a Mediterranean environment. *Agricultural Systems* 96:85-94.
- Martin P, Van Mellor T and Hooper S 2007, Australian beef: live cattle export trade— importance to northern and southern Australian beef industries, ABARE Report 07.1.
- McLachlan, I. (1989) The live sheep dispute – some personal reminiscences. Paper presented to the Conference “No Ticket, No Start - No More!” held by the H.R Nicholls Society, Canberra, 24-26 February 1989. Paper downloadable at <http://www.hrnicholls.com.au/nicholls/nichvol6/vol67the.htm>
- Meat and Livestock Australia 2007, The live export industry: assessing the value of the livestock export industry to regional Australia, a report to Meat and Livestock Australia and Livecorp prepared by AgEconPlus, EconSearch and Warwick Yates & Associates.
- O’Connell, M., Young, J. and Kingwell, R. (2006) The economic value of saltland pastures in a mixed farming system in Western Australia. *Agricultural Systems* 89:371-389.
- Quirke, D 2011, The contribution of the Australian live export industry to the Australian red meat industries and the regions, CIE presentation to ABARES’ Outlook Conference, 2 March 2011.
- Trebeck, D. (1989) The industrial significance of the 1978 live sheep export dispute. Paper presented to the Conference “No Ticket, No Start - No More!” held by the H.R Nicholls Society, Canberra, 24-26 February 1989. Paper downloadable at <http://www.hrnicholls.com.au/nicholls/nichvol6/vol67the.htm>

Figure A.1. Live sheep exports from Australia

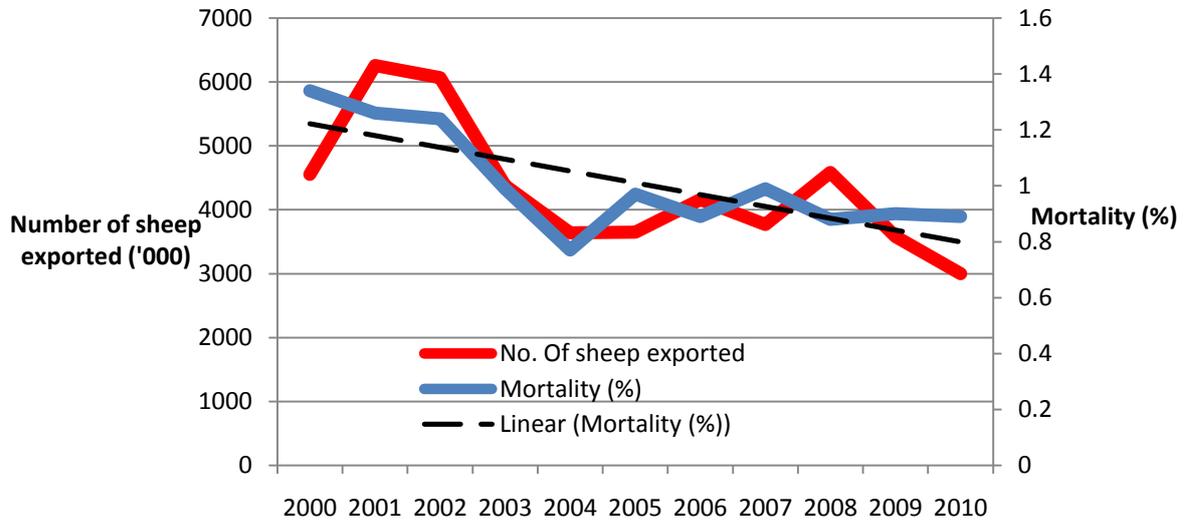
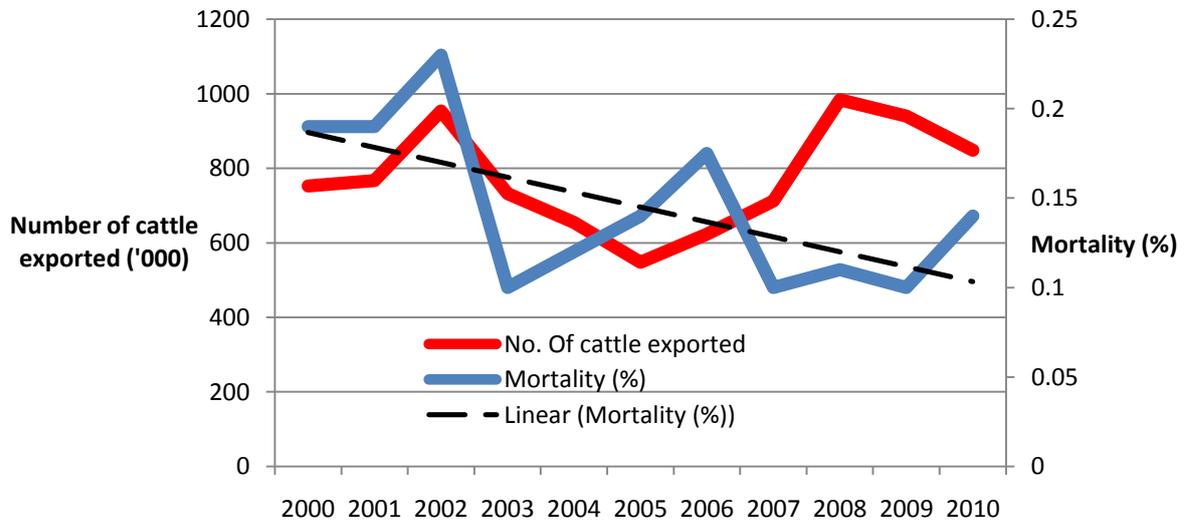


Figure A.2. Live cattle exports from Australia





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EXECUTIVE SUMMARY

Introduction

This study has been commissioned by the Department of Food and Agriculture (WA) and the Rural Industries Research and Development Corporation (RIRDC) to undertake a preliminary investigation of the need for a beef processing capability to service the Rangelands cattle production industry.

Since the closure of many smaller regional abattoirs since 1990, and the rise of the live export trade, there are few options for northern region producers to access a processing option for their product. The rise of Indonesia as the dominant market for northern Australian live exports (90%), exposure to the import policies of that country is of increasing concern to the industry.

This study examines, at pre-feasibility level, the potential viability of an abattoir (or abattoirs), particularly from a physical supply chain perspective. It includes a capital cost estimate for a new facility, and recommendations as to the best location for an abattoir to provide maximum benefit to the greatest number of producers.

Background

Rangelands cattle production in WA is oriented strongly towards the live export trade, with reliance on that market increasing in the more northerly areas. Kimberley region producers are particularly exposed to the live trade, and can only access south-western WA processing alternatives via long distance transport, which often greatly reduces financial returns. Pilbara, Gascoyne and Murchison producers are similarly affected, but have proportionally greater ability to sell cattle to southern processors.

The Rangelands cattle production areas are thinly stocked in comparison to agricultural zones and east coast pastoral areas. The Kimberley region has the heaviest herd density within the Rangelands. Annual turn off is around 150,000 head in the Kimberley, and 275,000 in total.

The live trade has recently become more vulnerable to importer policy changes and depressed prices. Current expectations are that the Indonesians will continue to enforce a 350kg mass limit and attempt to build a sustainable local breeding herd, but future trading conditions remain unpredictable. The viability of the Kimberley region industry, already marginal, is potentially at risk from any negative trends in this direction. The beef industry is also of greater significance to the Kimberley region economy than anywhere else in the state.

Viability of processing alternative

There is a strong need for a processing alternative or new live export market to protect northern producers against a deteriorating outlook for the Indonesian live trade. Some options involving recommissioning of old abattoirs (e.g. Katherine, NT) or developing existing facilities for dual species processing are being explored at present, but a larger scale facility is most likely to be required to address the forecast regional problems.

The development and operation of such a facility, however, would not be commercially viable under current and foreseeable market circumstances.

Despite this, several potential locations have been investigated from the point of view of the cost of getting product to market, access to reliable transport chains, labour availability and capital cost. These include Wyndham, Broome, Port Hedland and Newman. Of these, Broome is considered to offer the most advantages to a processor and to the local producers.

However, there is little incentive for processors to invest in abattoirs due to:

- Lack of scale – cattle turnoff rates are low in relation to the needs of a modern abattoir
- Seasonal variability of slaughter cattle supply
- Strongly competitive live export trade, and associated herd characteristics
- Remote locations affecting skilled labour availability

A processing chain featuring a new facility could not be expected to work as an option of 'last resort', behind the live trade. Processing would need to become the dominant stream in the region of the abattoir, with live export as a back-up option. This implies that it would need to feature:

- Consistent fundamental price differentials over the live trade
- Considerable commercial commitment, or ownership involvement, etc, by producers
- A significant level of integration along the chain to market

A hypothetical abattoir in the Kimberley region capable of processing 400 head per day would cost an estimated \$33.85m (+/-30%) excluding the provision of suitable serviced land. Preliminary costing of operations and freight costs suggests that a facility of this nature would be viable if supply can be maintained. Serious financial losses result from any significant shortfall in the required number of slaughter cattle.

There is little likelihood that smaller processing facilities or mobile abattoirs would offer any meaningful cost advantages to producers in the region and be competitive with the live trade in the longer term. As interim means of building up a processing capability, however, such entrepreneurial approaches are worthy of support by government.

The great challenge is for the industry to re-orient itself around a processing stream, and wean itself off live export dependence. This would require significant structural adjustment and the development of an agistment/fattening industry to underpin future diversification of marketing options and increased profitability for northern producers.

Key findings

Access to a processing stream would be of significant benefit to producers in Northern Rangelands, who are exposed to tightening live export market constraints.

Broome is the location that offers the most advantages to producers and processors as the site of a new facility.

For greatest operational efficiency, any new abattoir should be capable of processing a minimum 400 head per day, and should be focused on cattle, with other species (e.g. camel) targeted to utilise niche spare capacity only.

Abattoirs in the Northern Rangelands in WA would not be commercially viable in competition with a strong live export trade, without tangible government support, and without significant producer commitment to a processing alternative.

An industry restructuring effort towards the development of a significant agistment/backgrounding sector would benefit the industry generally, and also provide a more commercially attractive platform for a processing stream.

Findings in detail

Demonstrated need for a processing sector

- The high level of dependence on the Indonesian live export trade is a major business risk to beef producers in the Northern Rangelands.
- Current indications are that 350kg weight restrictions re-imposed by Indonesian live importers will remain in place for the foreseeable future. There will be an absence of sales options for cattle types excluded – cracker cows, pregnant females, heavy steers, shorthorn stock.
- A long term view of the Rangelands industry would incorporate the need to start planning for a processing option in preparation for future trends of this nature.
- Access to abattoir facilities and to a processing stream would be of significant benefit to the Rangelands beef industry, particularly producers in the most northerly areas. Producers in these areas suffer a significant financial disadvantage in using southern processors, due largely to live cattle freight costs.
- The relatively small size of the herd, and annual turnoff volumes, means that any new abattoir would need to command a large percentage of the live trade's current sales volume. An abattoir would not be able to survive on the live trade's 'discards' alone.

Separate regional approaches required

- The distance between the Kimberley and the Gascoyne regions is great. For the producers in different areas to gain access to a processing stream alternative, different regional strategies will be required. The greatest value in any abattoir option accrues to producers in the immediate region, and diminishes with the distance that needs to be covered by live animal transport.
- A West Kimberley abattoir would be of significant value to the Kimberley and Northern Pilbara regions, essentially adding a processing option not available at present. The likelihood that the Northern Territory will gain some processing capacity in the short to medium term, combined with other advantages means that the West Kimberley would be a better location than the East Kimberley.
- This means that a new facility would need to be developed for the region. Broome is the preferred location due to urban scale, access to road and sea freight advantages. Derby may be preferred as an industrial host, but would face disadvantages in attracting and retaining a supply of labour.
- A Gascoyne or Midwest regional abattoir would improve current returns over those from processing options currently available to Southern Rangelands, and Southern Pilbara producers. The need for this is less pressing than in the north. If an existing processing operation in the area can be extended to handle beef, this would be a better outcome than a new comprehensive abattoir.
- Existing abattoirs in the northern agricultural zone could be engaged in discussion regarding any interest in developing increased cattle slaughter capability. Government, however, should be mindful that this option could reduce the numbers of Rangelands cattle currently being processed in the south, which may affect profitability of some of these operators, and possibly hasten rationalisation of the domestic processing sector.
- Any new regionally significant facility should be built to best-practice standard, providing a comprehensive slaughter and boning service, and capable of processing a minimum 400 head per day. Investment in smaller facilities, or reducing the scope of services provided would reduce

capital risk but increase unit costs and reduce the ability to generate genuine commercial returns on capital for the owners.

Agistment sector planning

- As a pre-requisite for any abattoir development, a Rangelands regional plan for the beef industry is required to stimulate the development of a backgrounding or agistment sector, particularly in the north.
- This will involve the development of a feed-on capability in coastal areas, probably based on irrigated pastures, hay production and/or other roughage sources. This would ameliorate the 12 month supply problem previously faced by processors in the dry tropics. This development would provide focus for producers, including indigenous managed properties.
- There is no need for this sector to be developed in a single zone or property adjacent to an abattoir. Individual lease holders should be encouraged to make investments of this nature in strategically suitable areas. Mining leases capitalizing on dewatering options would be a good source of this capability.
- Development of such a sector would be of great benefit to the industry whether or not a processing stream emerges, and should be pursued in any case.
- Preliminary efforts should be in this direction, focusing on identification of suitable areas under artesian water resources planning, easier irrigation and development approvals on pastoral leases, and development of commercial structures for the provision of agistment etc as part of a processing stream.
- This planning process would also incorporate an investigation into the ability of producers to engage in an ownership structure with the abattoir operators to ameliorate seasonal supply risk and compete effectively with live trade prices from time to time.
- DAFWA would be well placed to lead a multi-agency approach to the co-ordinated development of such a plan, in collaboration with the Western Australian Beef Industry Council.

Economic viability

- Despite current levels of commercial interest in small scale investments, a significant abattoir development would require some active assistance from state and regional levels of government, in order to guarantee achievement of high quality product for the longer term.
- In strictly commercial terms, it is unlikely that a new facility will be viable at any location in the subject area, as the returns on capital are unlikely to be high enough to warrant the risks involved (seasonality, competition with live trade, foreign exchange fluctuations etc).
- Under ideal climatic and trade conditions, modelling suggests a new operation could be competitive with existing processors and would be strongly profitable. In most realistic seasons, however, when throughput is variable, profitability is lower, and losses would be incurred in the weaker seasons. This annual variability poses the greatest risk to the consistent positive returns sought by investors.
- For this facility to operate cost-effectively, throughput equating to around 75% of the average Kimberley live trade would be needed. This obviously implies that the live trade would need to become a back-up option for the Kimberley for the processor to be viable. This may only become a practical reality if Indonesian import restrictions were to be combined with domestic policy and regulation seriously restricting the live trade.

- A new comprehensive facility would certainly require some assistance from government sources, particularly to ensure that it is built and managed to optimum standard. Any capital assistance might be sourced from any compensation packages potentially resulting from negotiations over local Kimberley energy developments. Other forms of assistance could be through increasing ease of permits and licences, subsidized indigenous labour schemes, and industry structural adjustment funding (i.e. addressing the 'store trap' issue).
- Most importantly, it would require some form of producer commitment to be integrated into its ownership and management structure.
- To generate real ongoing value for producers from a processing stream, a genuine competitive local market for slaughter cattle would be necessary. This could be achieved, for example, through a system whereby more than one processor operated separate boning rooms in a common facility, under a 'service kill' model. Existing facilities operated by the processor closer to end markets would then finish the products for sale.
- Any new facility should be operated and managed by an operator or operators with strong international market presence, and a proven ability to target growth markets.
- Freight cost differentials between potential new abattoirs and established competitors are encouragingly low, given the availability of road and sea backload freight capacity. Processed meat product can be freighted much more cheaply than live cattle.
- Labour is the greatest cost component, and the seasonal cost risk problems might be ameliorated under the terms of any indigenous labour assistance schemes.
- Unpredictable supply problems would be further ameliorated if the agistment sector can be developed, and producer buy-in to the processing stream can be harnessed under a management model.
- Government assistance would be less significant and necessary for an existing operator seeking to offer a cattle slaughter service. It would be inappropriate for overt assistance to such a processor, where this might have a detrimental effect on the viability of other existing processors. Any assistance granted could be negotiated through normal state and regional development channels.
- The concept of seasonal processing of camels and goats has some merit, but should not distract from the fundamental need to establish fodder and agistment industries to support year round availability of stock for a beef processing facility.
- Mobile abattoirs would not appear to offer significant benefits to the industry in the long term and it is difficult to see how government could sponsor this form of processing in any substantial way. Entrepreneurial activity of this nature, however, could be a useful interim step towards the development of a processing alternative for the region.

Recommendations

In view of the growing risks to the viability of the live trade for many producers, the state Government should continue to investigate options for stimulating commercial development of a processing stream for the Rangelands.

As part of a risk-mitigation approach to this issue, the following steps should be taken:

- the future of the live export trade in WA should be formally reviewed in view of emerging market issues and the regulatory environment;

- a location for a possible abattoir in the area between Broome and Roebuck Junction should be researched in detail;
- identify the steps necessary to reduce impediments to the development of irrigation capability in key districts so that an agistment sector can be allowed to develop and flourish;
- existing major regional and national processor companies should be formally approached to consider commercial options for developing and operating such a facility, including the multi-operator 'service kill' and other models;
- estimate the 'commercial gap' between likely development and operating costs, and model financial viability in greater detail;
- determine the nature of any in-principle support that could be offered by the state to provide incentive to invest in processing (e.g. provision of land and headworks, low-interest loans, risk-sharing mechanisms etc)
- engage with producer organisations to determine the commercial structures necessary to give processing a dominant marketing position in the region

The state government should open discussions with existing WA abattoir operators seeking to expand their capability to offer services to the Rangelands beef industry. Types of assistance to be considered could include various forms of risk underwriting and a 'one-stop shop' approach to permits and approvals.

The Department (DAFWA) should initiate a multi-agency approach to the structural reform of the Rangelands beef industry and seek to incorporate a Northern Territory government response to the issues affecting the entire northern cattle production region.

A joint government industry Rangelands Cattle Industry Working Group (potentially established through the WA Beef Council) should address structural reform issues including the active development of agistment and fodder production industries to underpin improved productivity of the industry and any processing capability.

Working Group participants could include:

- State Government (DAFWA, Regional Development, Pastoral Lands Board)
- Commonwealth Government (RIRDC, DAFF, DFAT)
- Northern Territory Government
- Pastoral producers representation
- Indigenous development representation
- Mining industry representation

1. BACKGROUND TO THE STUDY

1.1 Introduction

This study has been conducted in response to a request from the Western Australian Department of Food and Agriculture (DAFWA) for a pre-feasibility study into the potentiality of a north Western Australian beef abattoir. The study has also been part-funded and supported by the Rural Industries Research and Development Corporation (RIRDC).

The need for the study is a growing recognition that the dependence on live export as a market for Rangelands cattle is a major source of risk to the viability of pastoral enterprises and the beef industry as a whole in the Kimberley, Pilbara and Gascoyne regions.

The development of an abattoir would offer producers in the Rangelands region an alternative production and marketing stream to the live export option. The location, scale and scope of any new facility, however, will be critical to its success. This study considers both the potential cost of meat production and the cost of getting such product to market, in competition with the live export option and other Western Australian beef production streams.

The study leans on previous reports examining the dynamics of the northern Australian beef industry. It uses the findings of these studies to inform an analysis of production cost and the transport and handling costs likely to be involved in getting product into the market.

In the course of this study, a wide range of consultations have been held, with field visits to each region and public meetings in Carnarvon, Karratha and Port Hedland. The consultants were able to meet with several producers on their properties in each region and also addressed a Pastoralists and Graziers Association (PGA) meeting in the Kimberley. The consultants have also benefited from the expertise of the Reference Panel for this study, which met several times at various stages of the project.

We would like to thank all producers, industry stakeholders and staff from DAFWA and other agencies that have contributed to the outcomes of this study.

1.2 Study Background

Cattle raising on the Western Australian Rangelands is fundamentally different to the more intensive beef farming industry in southern Australia. Northern beef production takes place in a unique physical and commercial environment, which results in great marketing and management challenges to be overcome in a highly competitive global market.

The northern production areas are characterized by:

- large scale enterprises on pastoral lease
- low herd density
- significant annual interruptions to turn-off due to heat, drought and tropical rainfall patterns
- long distances to market
- relatively low access to professional services due to isolation

There are two distinct production regions within the overall area. The Pilbara/Gascoyne region is separated from the Kimberley Region by the Great Sandy Desert and several hundred kilometres of highway. Similar production systems prevail in each area, but the Kimberley has the greatest herd numbers and density, and a significant degree of isolation from the remainder of the state, and markets.

The pattern of closure of regional meatworks in the Rangelands, and in Australia generally, has reduced the marketing options available for producers in remote areas. This important change was partly in response to the emergence of the live trade, combined with regulatory changes that have added costs disproportionately to smaller operators. The export beef processing sector is now dominated by large abattoirs, particularly in Queensland, slaughtering over 300,000 head of cattle per year.

The export meat industry perpetually faces difficult operating conditions, dealing with continual fluctuations in supply, demand, costs and prices reflecting changing trends in production conditions, global trade and currency fluctuations. This is a difficult environment for investment capital to be deployed in, as returns can vary quickly between the strongly positive and strongly negative.

The Western Australian industry also faces some strategic and structural disadvantages against east coast suppliers. Queensland production chains have some advantages in terms of scale, supply chain co-ordination and access to lucrative Asian markets for both live and processed products. The major export abattoir in Western Australia (Harvey Beef) lacks the security of supply and sufficient scale to warrant a year round multi-shift operation.

Several domestic beef abattoirs operate in the south-western sector, of which Gingin is the furthest north. Some slaughter cattle from the southern Rangelands are destined for these southern abattoirs, either directly or via saleyards, including the newly opened Muchea facility, but Kimberley cattle face prohibitively high costs in accessing these southern chains due to distance and transport regulations.

Thus Kimberley producers are now heavily oriented towards production for the live export trade, while Pilbara producers access both live trade and southern processing chains. Gascoyne producers are focused on the southern chains with a small proportion of turnoff going out live.

The dominance of production for the live trade has led to some herd characteristics that make for cattle less suited to the processing chain. Northern cattle are primarily of the *Bos indicus* type (e.g. Brahman), which are sufficiently hardy for the conditions and temperamentally suited to live carriage, but whose meat is generally of manufacturing standard (i.e. hamburger mince). These cattle are also less temperamentally suited to the management practices used in the feedlot sector.

Previous attempts to reinvigorate the processing stream for the northern industry have been unsuccessful, due to the orientation of the entire production culture of the region towards the live trade, and its relative success and simplicity. However, the industry is now vulnerable to changes affecting the returns and reliability of the live trade, and industry fears relating to this are currently quite high.

Government agencies in Western Australia and the Northern Territory have recently been asked to assist the industry in reviewing the potential for some processing capability to be re-established, particularly in northern Australia, in response to these fears. Attention is currently being paid to the feasibility of re-opening mothballed plants such as those at Katherine and Batchelor (Northern Territory) and Kununurra (Western Australia), as well as potential new developments serving the greater Rangelands area (such as this study).

The live trade has become very exposed to developments in the Indonesian market, whose growth has been responsible for overall growth of the WA live export sector, in the last few years. Most recently (June 2010), there has been evidence that Indonesia is acting to restrict numbers of imported cattle in response to damped global meat demand, and in support of its local producers.

This activity has led to renewed interest in local processing options throughout the region.

1.3 Consultation and acknowledgements

The study has been guided by a Reference Panel, who have provided invaluable advice, resources and information throughout the course of the project.

Reference Panel membership

- Kevin Chennell, DAFWA – Project Manager
- Chris Chilcott, DAFWA
- Ken Moore, RIRDC – Project co-sponsor
- Tim Darcy – Producer, Gascoyne
- Jack Burton – Producer, Kimberley
- Jim Motter – Producer and PGA Chairman, Kimberley
- Stephen Yule – Gascoyne Development Commission
- Paul Troja – CEO, Rockdale Beef, NSW
- John Donaldson - WA Meat Industry Authority
- Joe Ross – Dept of Indigenous Affairs
- Peter Trefort – Hillside Meats, Narrogin WA

Assistance

The study has been aided by the provision of advice and assistance from the following people and organisations:

- Meat and Livestock Australia – Michael Finucan
- DAFWA – Phil Thomas
- NT Live Exporters Association – Adam Hill
- Toll Express – Kevin Welsh
- Jepsens Shipping – Grant Williams
- WA Dept of Transport – Mark Brownell
- NT Dept of Resources – Neil McDonald
- Duncan Ord - Dept of Indigenous Affairs

Field trips

Two field trips were undertaken to gauge producer interest in the issues and meet with government and industry representatives at key locations in the Gascoyne, Pilbara and Kimberley areas.

Open meetings with producers were held at Carnarvon and Karratha, with the assistance of DAFWA regional staff. The PGA invited the consultants to address a grower meeting in Broome. At and following these meetings, productive discussions were held with interested parties. The consultants also had the opportunity to visit properties in each of the three regions, to gain improved understanding of Rangelands cattle raising, market options, regulatory issues and climatic conditions.

We would like to thank all those producers and other interested parties who attended the meetings, showed hospitality and participated in the study.

1.4 Structure of Report

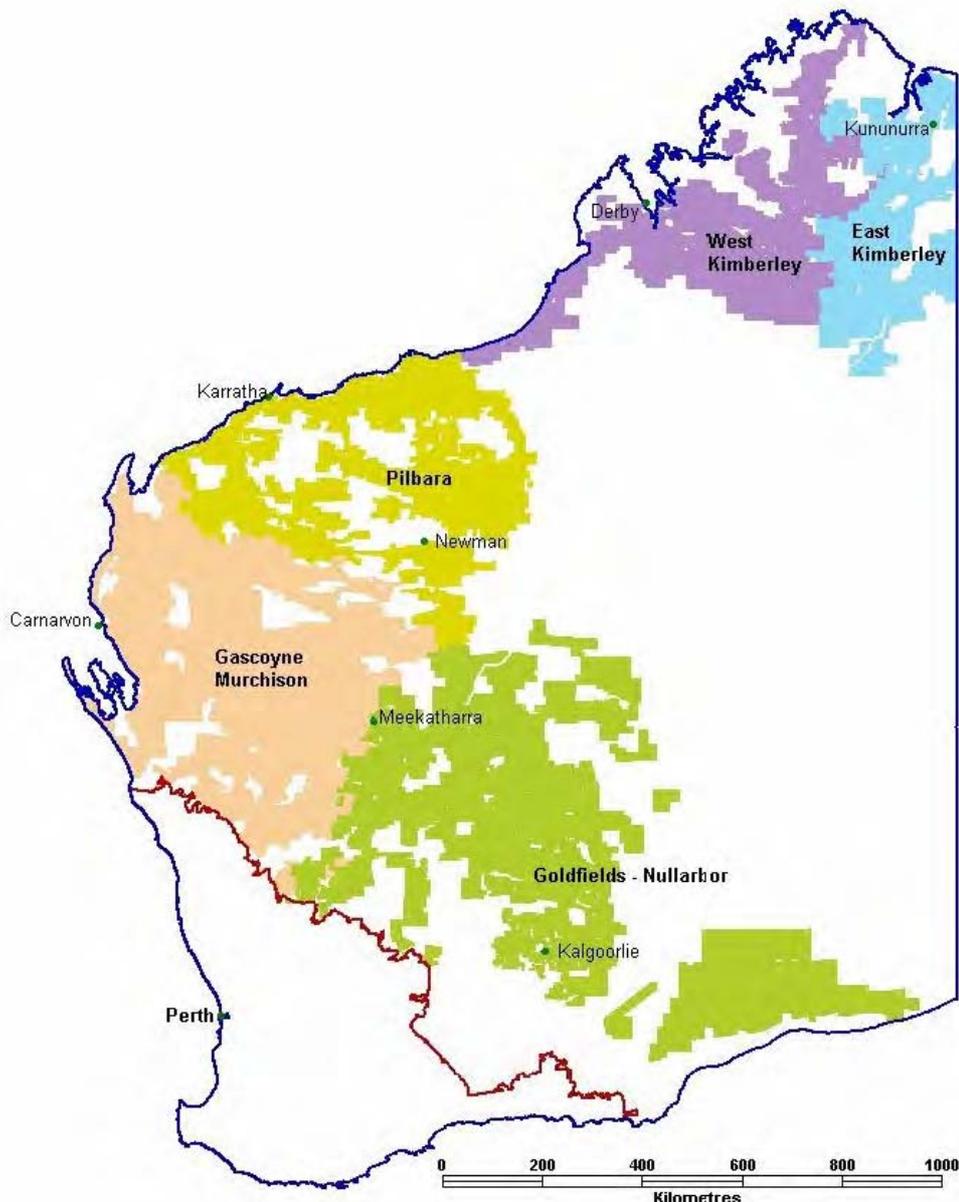
This report commences with a general description of the Rangelands cattle industry and the market options currently available to producers. It then discusses the live export trade and its growth prospects, and analyses the options, risks and issues associated with a move to develop a processing stream as an alternative market option. Potential locations are then assessed, before cattle supply chain development needs are discussed. Freight transport economics and abattoir costs are analysed, and a detailed capital costing prepared by Meateng is summarised (the full costing report is attached as an appendix). Finally the findings of the study are outlined.

2. THE RANGELANDS BEEF CATTLE INDUSTRY

2.1 Rangelands area

For administrative and reporting purposes, the Rangelands region is usually divided into regions (Kimberley, Pilbara, Gascoyne-Murchison) following shire boundaries. The Kimberley and Pilbara regions are often grouped as Northern Rangelands, while the Gascoyne region is contiguous with the southern agricultural area and is part of the Scrublands district which stretches towards the Goldfields.

Figure 1 - Map showing administrative divisions and pastoral leases



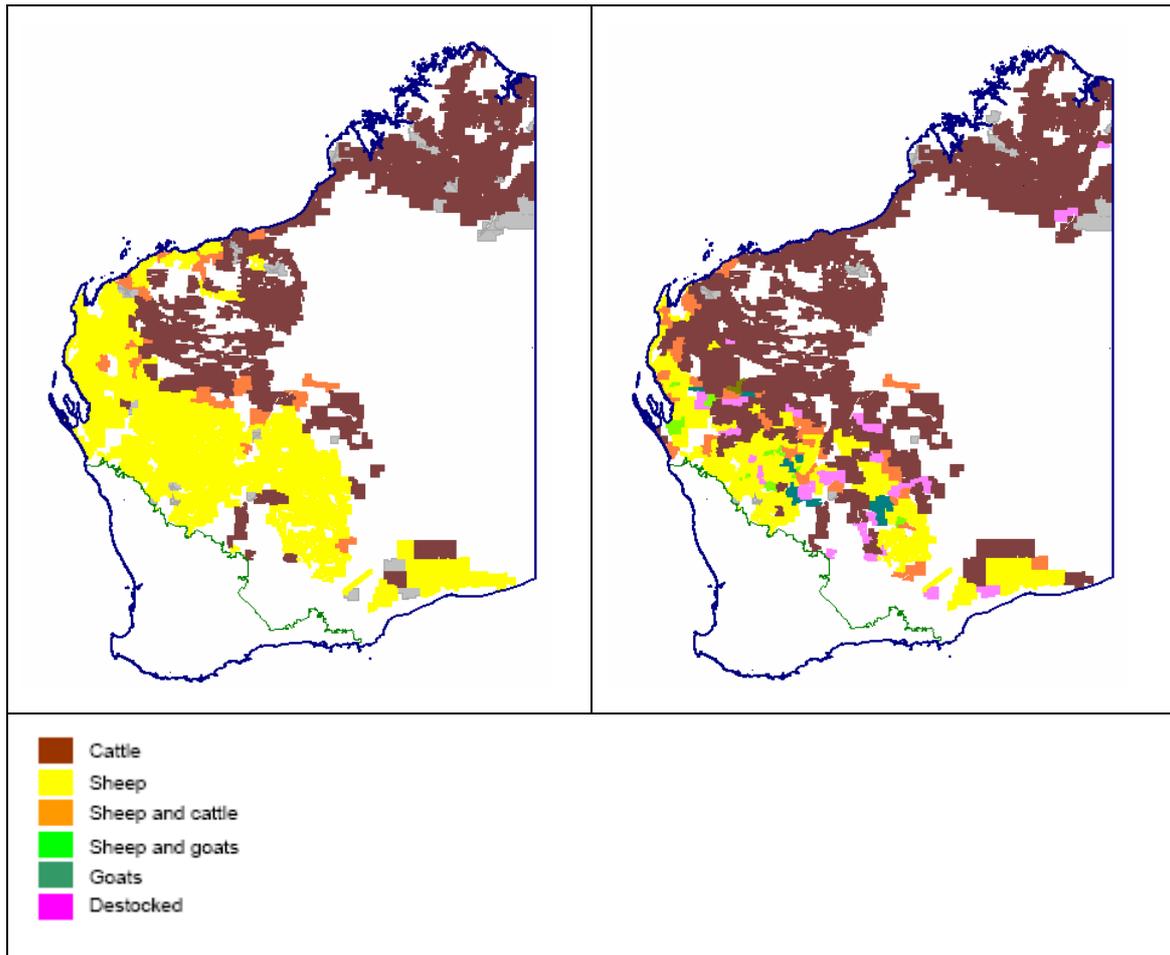
Source - Pastoral Lands Board (2006)

For the purposes of this study, which is focused more on the transport supply chain than on grazing and farming practices, the Pilbara district is more closely aligned with the Gascoyne area than the Kimberley. The Great Sandy Desert forms a geographical barrier between the Pilbara and Kimberley regions, and the tick line runs along the southern edge of the Kimberley region. This is a significant boundary in relation to transport characteristics and costs.

Figure 2 illustrates the geographical pattern of cattle production in Western Australia and how it has changed over time. Cattle raising is dominant throughout the Northern Rangelands, and sheep production has declined significantly in the Gascoyne and coastal Pilbara areas over the last 25 years. This is driven by greater returns available from cattle over sheep, and the higher costs associated with wool production.

The entire Rangelands cattle industry operates under Pastoral Lease conditions, and there are around 450 such properties (stations) in the area. Total annual pastoral livestock production is valued at \$240m, of which \$180m is made up of cattle sales (PLB, 2009).

Figure 2 - WA map showing changes in dominant livestock production between 1984 and 2004



Source: Pastoral Lands Board, 2005

The area under pastoral lease in each region is huge, as summarised in Table 1. The mix of tenure types differs quite markedly from region to region, with the Kimberley characterised by a high percentage of land under indigenous management and corporate control, with a small area of private smallholdings. In the Pilbara, there is a more even mix of lease types, and mining area leases total 20%, reflecting the main economic pursuits in the region, and the ability of mining companies to dewater their mines cost-effectively with livestock grazing.

The southern areas have small percentages of mining and indigenous leases.

Table 1 - Pastoral lease areas by region and tenure type (sq kms)

Sq.kms	Region				
	Kimberley	Pilbara	Gascoyne	Murchison	Total
Indigenous	65,181	16,770	2,884	11,146	95,981
Individual	47,386	49,758	33,374	114,539	245,056
Mining	0	29,643	0	27,380	57,023
Private	96,853	46,096	45,845	45,681	234,475
Foreign	2,405	0	0	0	2,405
Total	211,825	142,267	82,102	198,746	634,940

% within region	Region				
	Kimberley	Pilbara	Gascoyne	Murchison	Total
Indigenous	31%	12%	4%	6%	15%
Individual	22%	35%	41%	58%	39%
Mining	0%	21%	0%	14%	9%
Private	46%	32%	56%	23%	37%
Foreign	1%	0%	0%	0%	0%
Average	100%	100%	100%	100%	100%

Source – Pastoral Lands Board of Western Australia

Cattle numbers are concentrated most heavily in the Kimberley, and are increasingly less concentrated with southerly location. The concentration of cattle production is low in the Gascoyne and Murchison as sheep and other species are prevalent in these regions, and pasture quality, and carrying capacity is lower in the inland.

2.2 The Rangelands herd

Table 2 illustrates the concentration of cattle raising on each region's pastoral leases. There are more cattle per square km in the Kimberley than elsewhere, but the overall density is very low in relation to other Australian cattle raising areas.

Table 2 - Herd density (cattle units/sq km of pastoral lease land)

cu/sq km	Region			
	Kimberley	Pilbara	Gascoyne	Murchison
Indigenous	2.05	0.86	1.03	0.21
Individual	3.59	2.23	0.96	0.57
Mining	0.00	1.77	0.00	0.42
Private	3.79	2.43	1.61	0.56
Foreign	5.03	0.00	0.00	0.00
Average	3.22	2.04	1.33	0.53

Source – Pastoral Lands Board of Western Australia

There have been changes to the herd dimensions in each region over the last decade

Table 3 - Annual changes in herd size by region and tenure type

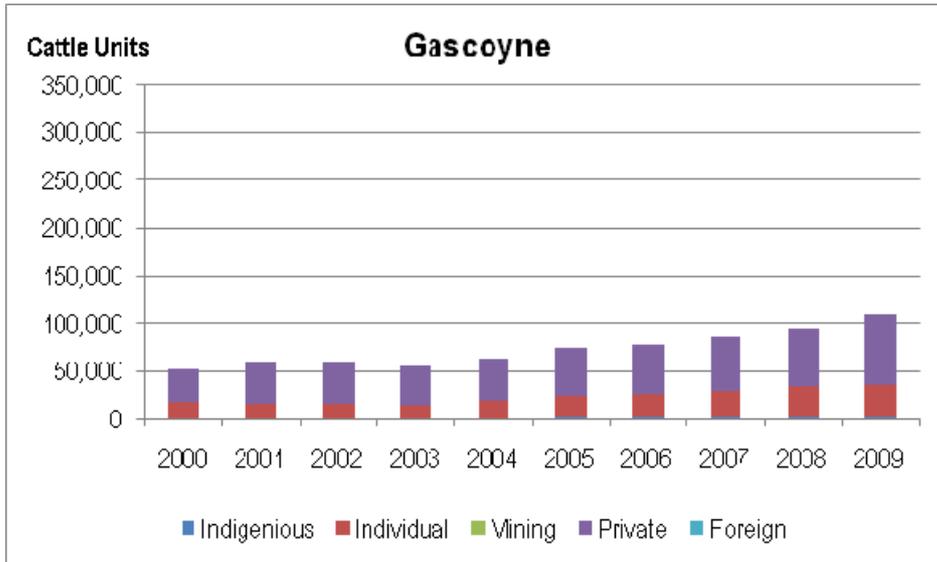
<i>Region</i>		<i>Area (ha)</i>	<i>2000</i>	<i>2001</i>	<i>2002</i>	<i>2003</i>	<i>2004</i>	<i>2005</i>	<i>2006</i>	<i>2007</i>	<i>2008</i>	<i>2009</i>
KIMBERLEY	Indigenous	6,518,082	71,207	49,019	70,702	60,124	65,824	97,583	92,348	109,014	84,757	133,614
	Individual	4,738,578	89,700	99,669	107,832	113,496	120,868	121,460	129,854	146,536	158,095	169,971
	Mining	0	0	0	0	0	0	0	0	0	0	0
	Private	9,685,342	349,068	304,698	323,115	329,483	353,188	346,966	375,819	376,334	389,836	367,145
	Foreign	240,481	6,710		10,938	9,512	9,812	10,581	10,976	9,561	11,899	12,098
	Total	21,182,483	516,684	453,385	512,586	512,614	549,693	576,590	608,997	641,445	644,586	682,828
PILBARA	Indigenous	1,677,040	5,702	9,333	10,760	15,213	16,811	17,529	16,838	16,613	18,105	14,492
	Individual	4,975,771	90,676	95,958	98,555	92,609	93,682	84,966	98,718	95,905	96,545	110,892
	Mining	2,964,279	30,187	29,432	32,478	32,924	39,256	43,395	47,385	45,922	47,884	52,477
	Private	4,609,571	84,301	84,774	103,655	88,780	87,698	80,622	83,739	94,183	113,517	112,111
	Foreign	0	0	0	0	0	0	0	0	0	0	0
	Total	14,226,661	210,866	219,497	245,449	229,526	237,446	226,512	246,681	252,623	276,051	289,972
GASCOYNE	Indigenous	288,359	725	0	1,606	1,391	1,538	2,363	2,091	2,559	3,528	2,967
	Individual	3,337,406	17,643	15,882	14,565	13,296	16,885	20,993	23,782	27,005	30,649	32,102
	Mining	0	0	0	0	0	0	0	0	0	0	0
	Private	4,584,473	33,226	42,203	42,718	40,815	44,195	51,093	51,423	56,301	60,539	73,862
	Foreign	0	0	0	0	0	0	0	0	0	0	0
	Total	8,210,238	51,593	58,085	58,888	55,502	62,618	74,449	77,296	85,865	94,716	108,931
MURCHISON	Indigenous	1,114,586	2,448	3,189	2,134	691	2,124	1,025	937	1,430	108	2,301
	Individual	11,453,891	39,910	35,325	40,839	48,000	49,236	47,115	47,566	53,943	57,522	64,757
	Mining	2,738,044	5,760	6,021	5,974	6,086	7,878	7,296	7,877	10,386	11,970	11,608
	Private	4,568,101	20,223	18,201	16,198	16,555	16,027	15,763	21,633	22,693	24,297	25,679
	Foreign	0	0	0	0	0	0	0	0	0	0	0
	Total	19,874,622	68,340	62,737	65,145	71,332	75,266	71,199	78,012	88,453	93,898	104,345

Source – Pastoral Lands Board of Western Australia

2.2.1 Gascoyne/Murchison

This region extends from the Carnarvon coast inland towards Meekatharra. The beef cattle herd is an estimated 108,000 in the Gascoyne, and 104,000 in the Murchison, with heaviest stocking in the northern parts of the region, though growing significantly in the south as traditional sheep country is adapted.

Figure 3 - Current herd breakdown by pastoral lease type - Gascoyne



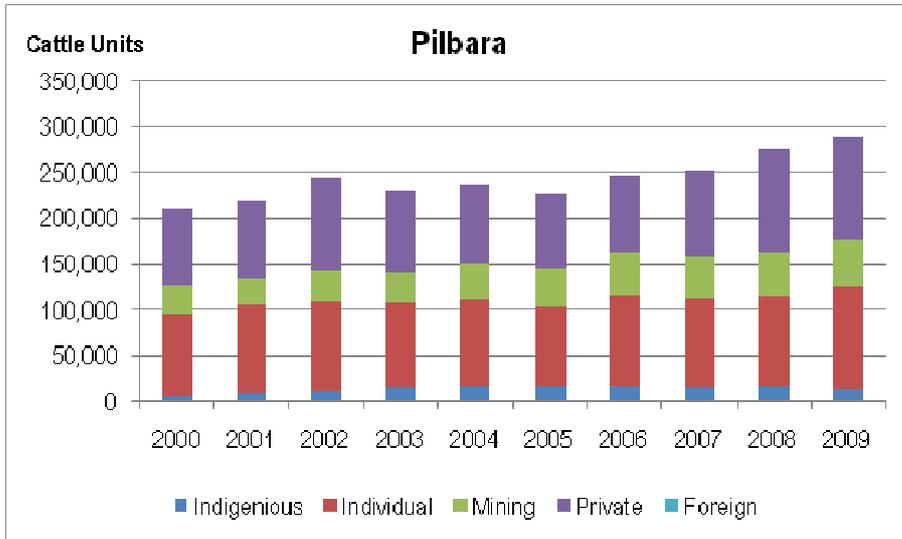
Source – Pastoral Lands Board of Western Australia

The region includes breeding properties as well as providing backgrounding services for northern-bred cattle en route to saleyards for slaughter or live export ex-Fremantle. There are no designated feedlots in the area, but its proximity to the grain growing areas in the Midlands region points to potential future activity of this type.

2.2.2 Pilbara

The Pilbara region extends inland from the coast to well beyond the mining centre of Newman, with a light population density of 2 'cattle units'/sq km. The herd is currently estimated at 280,000 head, having increased steadily through the last decade. This number is considered to be close or above the long term potential carrying capacity of the region (Neithe, 2008), which takes into account long term average pasture condition and water availability etc.

Figure 4 - Current herd breakdown by pastoral lease type - Pilbara



Source – Pastoral Lands Board of Western Australia

Climatic conditions are severe in the tropical areas. The region has suffered serious drought conditions in 2010, which will impact on herd numbers in the short term. Soils in general are of low quality and poor water-handling capability exacerbates rainfall uncertainty.

The annual wet season typically brings 3-4 months of extreme heat and frequent cyclonic rain events which interrupt mustering activities and can disrupt the flow of weaners and older cattle for backgrounding and/or sale.

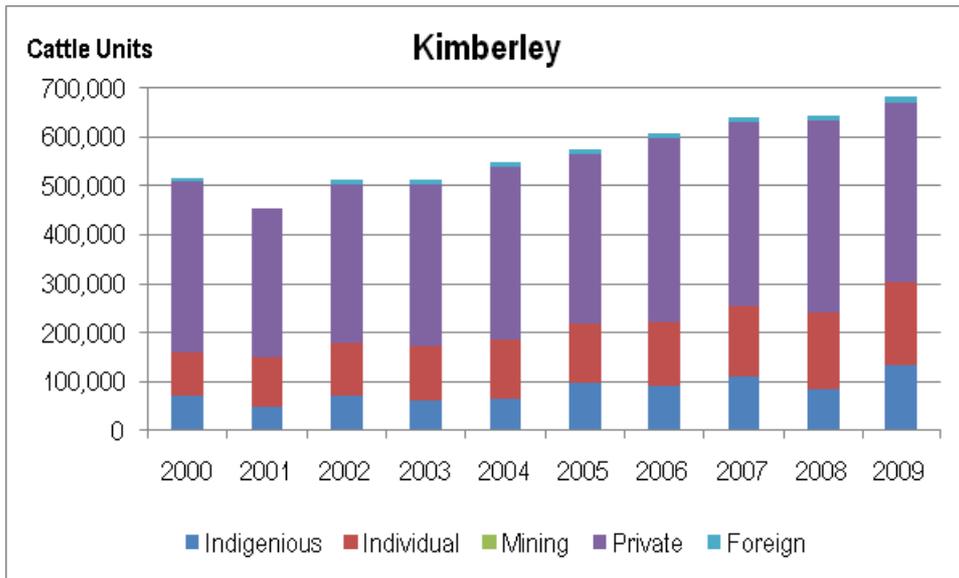
Sales in the region account for around 90,000 head per year, a 30% turn-off rate. Of this figure, around 50% is understood to be destined for backgrounding in the northern agricultural areas and eventual processing. The remaining half is exported live via Port Hedland or Broome.

2.2.3 Kimberley

The Kimberley region with the most concentrated cattle population has a herd of about 625,000 head, around 60% of the estimated 1 million cattle in the Rangelands areas.

The heaviest concentration of cattle is in the West Kimberley area, but the herd density is fairly consistent across the entire region, reflecting the importance of the industry to the region. The East Kimberley borders the Northern Territory pastoral lands and has much in common with Northern Territory Cattle industry, particularly in relation to market options.

Figure 5 - Current herd breakdown by pastoral type - Kimberley



Source – Pastoral Lands Board of Western Australia

Climatic and soil conditions are similar to those in the Pilbara, and cattle raising can be a precarious business activity. The long distances to market and support services, limited road access and extreme climatic conditions contribute to the difficulties.

2.3 Turnoff

Annual turnoff varies considerably throughout the Rangelands, and from year to year.

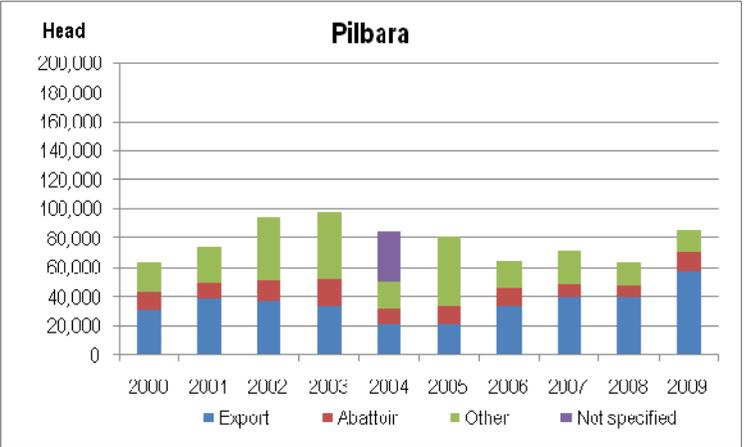
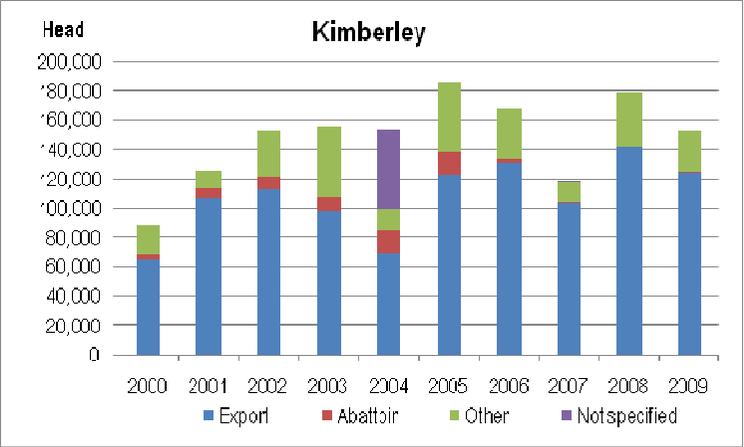
Live export has become progressively more important in recent years, particularly for the Northern Rangelands. Table 4 illustrates the scale of annual sales and the nature of sales for each region.

Table 4 - Cattle sales by region and market type (2000 – 2009)

Head of cattle		Year										
Region	Destination	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	average
Kimberley	Export	64,783	106,896	112,696	98,757	68,993	123,015	130,398	103,419	141,651	124,076	107,468
	Abattoir	3,218	6,481	9,110	8,670	16,390	15,355	2,645	924	235	474	6,350
	Other	20,296	12,135	31,090	47,709	14,083	47,531	34,827	13,150	37,399	28,095	28,632
	Not specified	0	0	0	-8,273	54,265	0	0	100	0	0	4,609
Kimberley Total		88,297	125,512	152,896	146,863	153,731	185,901	167,870	117,593	179,285	152,645	147,059
Pilbara	Export	30,740	38,726	37,252	33,915	20,660	21,138	34,195	39,865	39,845	57,750	35,409
	Abattoir	12,192	10,124	13,885	17,645	10,607	12,578	11,233	8,610	7,743	13,032	11,765
	Other	20,590	24,674	43,044	46,424	18,908	47,908	19,405	22,582	16,481	15,349	27,537
	Not specified	0	0	0	-9,158	35,243	0	0	0	0	0	2,609
Pilbara Total		63,522	73,524	94,181	88,826	85,418	81,624	64,833	71,057	64,069	86,131	77,319
Gascoyne	Export	6,882	4,955	10,797	3,069	195	6,850	8,105	10,838	10,738	16,688	7,912
	Abattoir	2,800	5,858	7,409	3,743	1,724	1,852	6,115	3,420	4,523	7,637	4,508
	Other	6,148	7,494	10,089	16,625	234	11,282	11,681	7,937	8,845	6,589	8,692
	Not specified	794	1,077	1,090	-174	14,849	0	0	0	0	0	1,764
Gascoyne Total		16,624	19,384	29,385	23,263	17,002	19,984	25,901	22,195	24,106	30,914	22,876
Murchison	Export	7,961	5,027	3,155	2,087	1,565	5,200	5,445	6,850	10,222	12,487	6,000
	Abattoir	4,760	8,779	5,982	2,669	3,104	1,797	2,113	2,204	2,661	5,013	3,908
	Other	13,911	14,749	36,232	23,168	904	22,977	10,059	10,586	14,470	10,214	15,727
	Not specified	0	0	0	-320	18,973	0	0	0	0	0	1,865
Murchison Total		26,632	28,555	45,369	27,604	24,546	29,974	17,617	19,640	27,353	27,714	27,500
Grand Total		195,075	246,975	321,831	286,556	280,697	317,483	276,221	230,485	294,813	297,404	274,754

Source – Pastoral Lands Board of Western Australia

Table 5 - Sales figures trends (2000 – 2009) by region



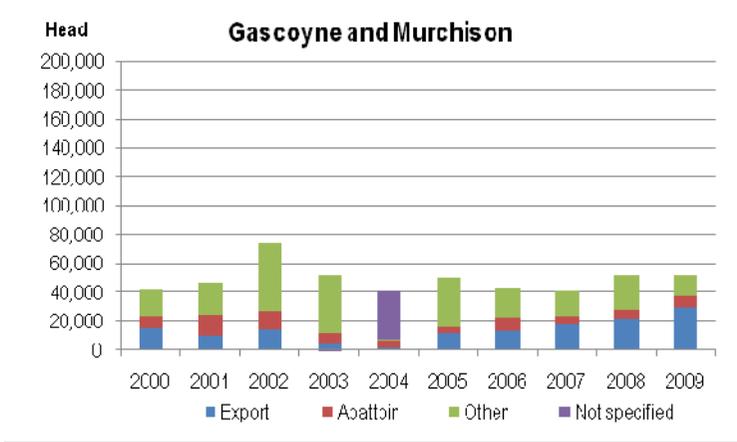


Table 5 above, shows how estimated sales volumes have varied from year to year in each region. The Kimberley has the most volatile sales numbers, including a severe dip in 2007. The lack of an abattoir sales option for the Kimberley is clearly depicted, since the closure of the Kununurra facility in 2005. The dominance of the live trade is also clear. The category 'other' includes sales where the eventual destination of the animal is not known or declared.

The high proportion of 'other' sales in the Pilbara and Gascoyne, reflects the proximity of these regions to the southern saleyards and agricultural area backgrounding properties, destinations less attractive to the Kimberley producers.

Sales volumes vary from year to year as turn-off rates are surprisingly volatile, at least according to official data. Neithe (2008) reports figures indicating that Kimberley turn-off has varied between 16% and 30% over the last decade, and 25%-43% in the Pilbara, with the low points occurring in poor isolated seasons. Overall turn off rates have improved slowly in the last 25 years, but are still considered inferior to those in agricultural regions.

Total sales for the region remain under 300,000 in any one year, with the exceptions being 2002 and 2005, when 320,000 sales were recorded, of which around 50% were recorded in the Kimberley.

Figure 6 - NW WA cattle production regions with indicative annual cattle movement numbers ('000)

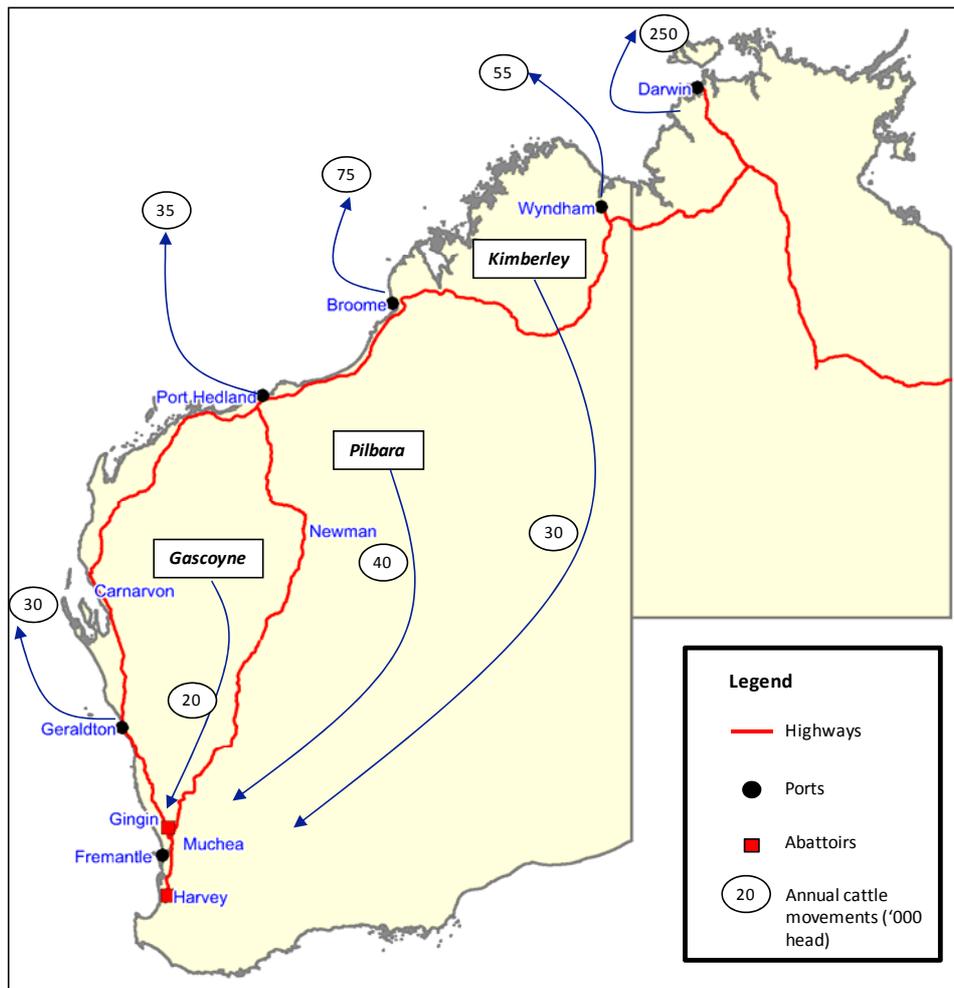


Figure 6 above, summarises the average number of cattle sold and transported to market for each region, illustrating the basic market options available to producers in each region.

The Rangelands herd has grown 40% from an estimated 850,000 in 2000 to 1,200,000 (expressed as cattle units) in 2009.

Kimberley and Pilbara sales are heavily oriented towards the live trade, while Gascoyne Murchison sales are shared between the live trade and processing options in the South West.

3. THE LIVE EXPORT TRADE

Growth in the live trade accelerated during the early 1990s, as the potential for development of a viable alternative export industry was realised. Live exports had been occurring prior to this, as the northern Australian production area had advantages over Asian cattle raising lands. It was only with the development of infrastructure such as ports, purpose built shipping, AQIS accredited holding yards etc, that the full potential of the trade was realized.

Western Australian exports rocketed from 20,000 head in 1990 to 280,000 in 1998, with similar growth experienced in the other northern states. Total Australian exports peaked at around 940,000 in 2002, of which about one third were from Western Australia. In more recent years, despite a significant fall in exports ex-Queensland, the numbers exported from Western Australia have been in the range 270-380,000 per year, with 2009 the heaviest year to date at 381,000.

The West Australian export task is divided fairly consistently between five ports servicing the Rangelands and agricultural production areas, as follows:

Table 6 - Live cattle export volumes by port (WA and NT)

<i>(head)</i>	2005	2006	2007	2008	2009	average
Broome	82,815	85,368	92,679	81,324	96,629	87,763
Wyndham	65,587	48,669	41,544	50,969	75,474	56,449
Port Hedland	7,050	17,126	22,187	19,968	22,895	17,845
Geraldton	31,081	24,621	19,482	35,463	48,288	31,787
Fremantle	84,513	141,926	115,941	147,709	138,501	125,718
Total WA	271,046	317,710	291,833	335,433	381,78	319,562
Darwin	209,274	239,948	288,787	359,307	353,278	290,119
Total WA and NT	480,320	557,658	580,620	694,740	735,065	609,681

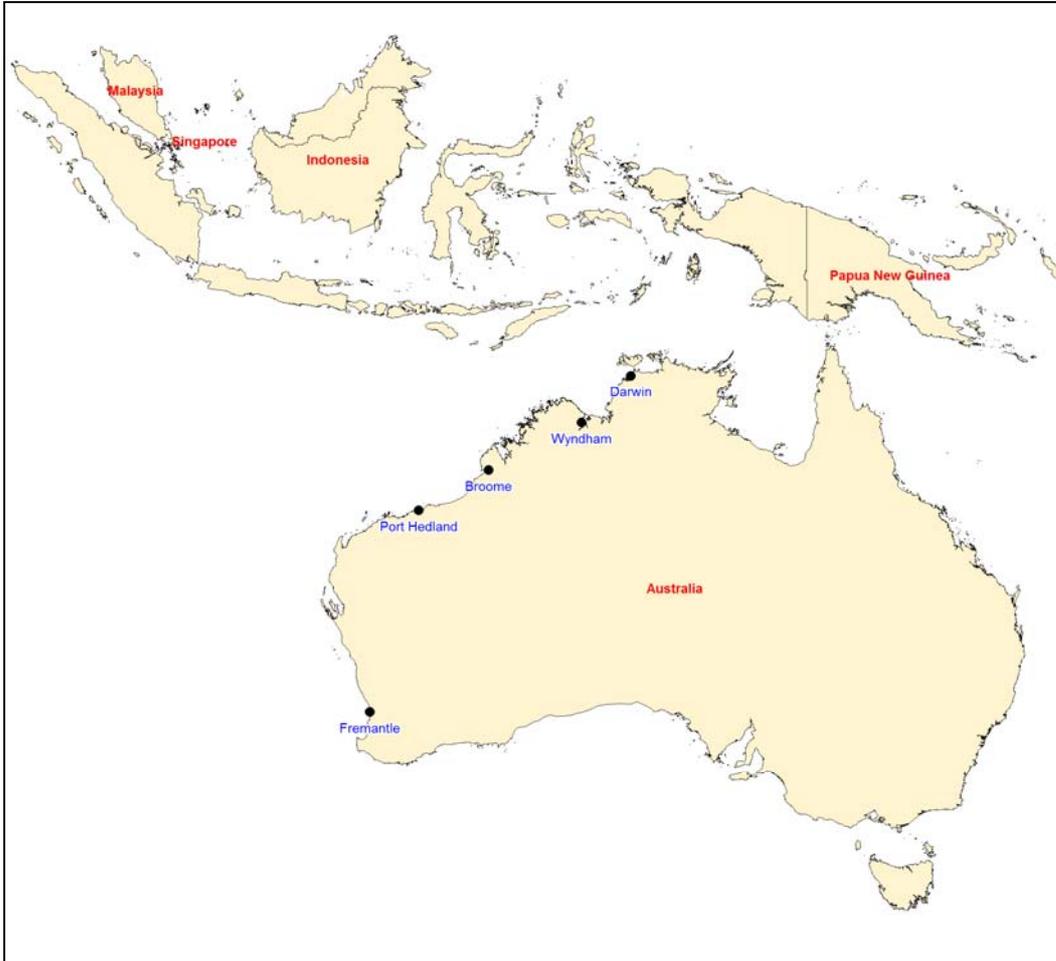
The heaviest regional throughput is at the Kimberley ports (Broome and Wyndham), while Fremantle is the largest single export destination, serving both the agricultural region and the Rangelands.

Once these pathways to market were consolidated, the live trade became the simplest and most profitable source of revenue for the northern pastoral leases. Ironically, the sudden success of the live trade was the final nail in the coffin for the abattoirs serving the northern regions, which had always tended to struggle with issues of quality supply. The subsequent closure of abattoirs, in turn, resulted in a large scale orientation of the herds towards live export characteristics, principally towards turn-off of younger *Bos indicus* cattle. This trend has dramatically increased the exposure of northern producers to the risks associated with having a single market for an export product with limited access to domestic markets.

In recent times, the spread of international consumers of northern Australian live cattle has narrowed dramatically from importers in several countries, to a 90% focus on heavily regulated Indonesian buyers.

Figure 7 following, illustrates the proximity of the Western Australia ports with Indonesia and nearby Asian markets

Figure 7 - Northern Australia and SE Asia



Indonesia prefers to buy young cattle for fattening in its own feedlots, and has been recently advertising a wish to reduce its dependence on foreign cattle by improving its breeding herd performance. In June 2010, Indonesia announced a renewed enforcement of a rule limiting the weight of imported cattle to 350kg, overturning recent practice enforcing this as an average weight limit across a shipment. On top of recent reduced purchase volumes and lower prices, this is causing concern about the future market outlook for northern producers.

Any significant reduction in the live trade would have a negative impact on prices received by West Australian producers, though over time this effect would eventually be balanced out by global adjustments in supply and demand.

There is a general tendency for prices and market activity to spike downwards at the start of the dry season, though this year's reversal has apparently been more severe than usual.

Table 7 shows how Indonesia has become the dominant market for all Australian live exports (including Queensland and southern states). The Indonesian percentage from West Australian ports is higher than the national average set out in the tables. The percentage of Indonesian purchases from the northern West Australian ports is presumably higher again, towards the 90% currently quoted anecdotally.

Table 7 - Australian live cattle export destinations (1990-2009)

Destination	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Indonesia	8,061	12,668	24,981	58,299	118,034	228,422	388,974	428,077	41,174	159,548
Philippines	22,625	19,873	56,604	93,475	128,130	209,192	206,317	259,702	215,961	268,784
Egypt						15,541	52,210	37,539	119,579	240,482
Malaysia	22,512	25,495	23,298	24,799	29,773	38,891	44,484	73,752	43,587	65,227
Israel							1,485		8,719	8,715
China			8	87			110	1,380	240	
Japan	31,503	30,976	21,696	16,613	11,130	10,050	15,481	19,857	17,148	12,362
Saudi Arabia	646							1,100		
Jordan				768		1,132	4,563	2,451	18,128	37,560
Other	15,003	34,785	21,669	19,032	14,080	15,782	27,474	124,205	156,585	51,551
Total	100,350	123,797	148,256	213,073	301,147	519,010	741,098	948,063	621,121	844,229
Indonesia % of total	8%	10%	17%	27%	39%	44%	52%	45%	7%	19%

Destination	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indonesia	296,653	289,525	426,458	387,160	359,560	347,967	386,566	516,992	644,849	772,868
Philippines	223,773	97,411	115,522	96,016	46,918	20,941	13,159	20,354	10,791	12,860
Egypt	207,551	203,206	145,015	7,583		6,961				
Malaysia	56,772	77,925	92,009	87,955	47,541	38,067	56,484	35,018	20,263	13,651
Israel	15,837	34,966	47,777	43,213	20,947	32,027	79,443	36,895	51,721	36,901
China	285	1,985	9,372	44,138	73,911	32,512	9,879	8,785	12,767	32,798
Japan	14,393	17,957	14,028	22,034	18,098	25,269	21,944	21,083	19,770	16,039
Saudi Arabia		20,800	54,277	15,969		17,522	27,586	16,254	18,303	18,346
Jordan	40,736	13,186	4,765	23,065	34,154	16,980	5,935	5,163	830	27,578
Other	39,982	65,513	62,657	47,115	36,619	34,553	33,318	58,938	89,216	23,102
Total	895,982	822,474	971,880	774,248	637,748	572,799	634,314	719,482	868,510	954,143
Indonesia % of total	33%	35%	44%	50%	56%	61%	61%	72%	74%	81%

Source - ABARE (2007)

The live trade from the region has grown significantly in the last decade, particularly through Broome and Wyndham. In 2009, an estimated 240,000 head were exported through ports serving the Rangelands.

Indonesia has become the dominant importer of WA live cattle, and the industry is exposed to serious risks associated with reductions in demand and tightening product specifications

4. TOWARDS A BEEF PROCESSING STREAM

4.1 Processing options in Western Australia

The meat processing sector in Australia is increasingly characterised by large processing companies operating large facilities. Table 8 shows a list of the top beef and sheep processing companies in Australia. The two major processors (Teys Bros and JB Swift Australia) operate several plants each, the largest of which are located at coastal or metropolitan locations in Queensland.

The three export beef processors in Western Australia are relatively small compared to the major national players. They are located in the far south-west of the state in the heart of the prime beef production area. There are another four southern meatworks supplying the domestic market only.

In 2007, an estimated 469,000 head of cattle were slaughtered in Western Australia (O'Loughlin, 2008). The largest processor is Harvey Beef, followed by VV Walsh and Western Meat Packers, which process an estimated 340,000 head between them.

Harvey Beef has since increased its capacity from 700 head per day to 1000 per day, and initiated a second shift. It has, however, been unable to source a sufficiently reliable year round supply of cattle to capitalise on this new capacity, and has increased its production by around 10% since 2007.

The review of abattoir capacity by DAFWA (O'Loughlin, 2008) noted that there were several companies expressing plans to increase abattoir capacity at that time. Unused operational abattoir capacity was roughly estimated at 20%. In view of this, it was considered that there was insufficient increase in demand for Western Australian meat products to warrant a new abattoir being developed at that stage. That conclusion, however, would have been based on the assumed continuation of growth in the live trade as well as the fairly static market for south western West Australian beef products.

A previous DAFWA report (Burggraaf & Manners, 2005) opined that there would be some rationalisation of the smaller domestic abattoirs in the following five years or so, and that an export-licensed small to medium sized new abattoir could replace some older small facilities. There is no hard evidence yet of any moves in that direction, but operating margins for some of these existing plants are considered to be thin, in view of chronic supply security problems in Western Australia generally.

4.1.1 Northern Rangelands

The only northern Australian facilities outside the capital city environs are those at Rockhampton and Biloela in Queensland. There are no meatworks in the Rangelands area, or in the adjacent Northern Territory production areas, several having closed down in recent decades as the live export trade has grown. Some of these facilities closed due to changes in supply and/or skilled labour shortages, while others found themselves priced off the land by residential development (e.g. Broome).

Non-operational facilities still exist, e.g. at Kununurra, and periodically interested parties review the option to recommission these works. The difficulties involved in bringing old plant up to new hygiene and food quality standard, however, would add considerable cost to this approach. Gaining water licences and environmental approvals in some areas would also be a hurdle for recommissioned premises, as compared to existing premises seeking to expand capacity.

Table 8 - Top 25 red meat processors in Australia (2007)

Organisation	Throughput ETCW 2007 (a)	Throughput ETCW 2006	Kill share % 2007 (b)	No. plants operated in 2007	Species	Employee numbers	conversion	live weight tonnes	average live weight tonnes)	est head / year
JBS Swift Australia Pty Limited	453,000	436,000	15.77%	4	Beef	4,800	50%	906,000	0.60	1,510,000
Teys Bros Pty Limited	344,933	273,300	12.01%	6	Beef	2,700	50%	689,866	0.60	1,149,777
Nippon Meat Packers Aust Pty Limited	164,200	168,700	5.72%	3	Beef	1,650	50%	328,400	0.60	547,333
Tasman Group Services	163,072	162,000	5.68%	6	Multi	1,900	50%	326,144	0.60	543,573
Cargill Beef Australia	152,000	145,000	5.29%	2	Beef	1,100	50%	304,000	0.60	506,667
T&R Pastoral Pty Limited	133,000	99,800	4.63%	4	Multi	1,400	50%	266,000	0.60	443,333
Fletcher International Exports Pty Ltd	82,400	80,000	2.87%	2	Sheep	1,365	50%	164,800	0.60	274,667
Australian Country Choice Production Pty Limited	60,250	54,750	2.10%	1	Beef	950	50%	120,500	0.60	200,833
H. W. Greenham & Sons Pty Limited	58,000	53,500	2.02%	2	Beef	475	50%	116,000	0.60	193,333
Rockdale Beef Pty Limited	54,870	54,750	1.91%	1	Beef	450	50%	109,740	0.60	182,900
Kilcoy Pastoral Company Limited	54,200	52,800	1.89%	1	Beef	550	50%	108,400	0.60	180,667
JSA Jackson & Son Pty Ltd	49,515	47,600	1.72%	2	Sheep	580	50%	99,030	0.60	165,050
Unnamed	47,766	72,000	1.66%	2	Beef	550	50%	95,532	0.60	159,220
MC Herd Pty Limited	47,000	45,500	1.64%	1	Multi	n/a	50%	94,000	0.60	156,667
Harvey Industries Group Pty Limited	44,486	44,200	1.55%	1	Beef	300	50%	88,972	0.60	148,287
G & B Gathercole (Vic) Pty Limited	40,140	35,000	1.40%	3	Multi	390	50%	80,280	0.60	133,800
Unnamed	39,500	39,500	1.38%	1	Beef	n/a	50%	79,000	0.60	131,667
Tatiara Meat Company Pty Ltd	39,200	n/a	1.36%	1	Sheep	470	50%	78,400	0.60	130,667
Stanbroke Beef Company Pty Limited	38,000	36,500	1.32%	1	Beef	n/a	50%	76,000	0.60	126,667
Unnamed	37,000	37,000	1.29%	1	Beef	n/a	50%	74,000	0.60	123,333
Primo Australia Scone Abattoir	35,000	32,000	1.22%	1	Beef	360	50%	70,000	0.60	116,667
CRF (Colac Otway) Pty Ltd	34,320	n/a	1.19%	1	Sheep	377	50%	68,640	0.60	114,400
V & V Walsh Pty Limited	34,320	35,600	1.19%	1	Multi	300	50%	68,640	0.60	114,400
Northern Co-Operative Meat Co Limited	30,226	45,932	1.05%	2	Multi	961	50%	60,452	0.60	100,753
Southern Meats	28,000	51,000	0.97%	1	Sheep	480	50%	56,000	0.60	93,333
Western Meat Processors	25,000			1	Multi	n/a	50%	50,000	0.60	83,333
Combined total (top 25)	2,289,398		78.83%	52						

Source - Meat & Livestock Association (2007)

4.1.2 Southern Rangelands

Beef production in the Southern Pilbara and the Gascoyne region is focused more or less equally between the live export trade and southern processors.

The independently owned Geraldton Meat Exports (GME) sheep/goat abattoir has potential to expand its activity into beef processing, which would help balance its winter seasonal shortfall in numbers of the smaller ruminants. To achieve this, however, the company would need to add a new slaughter floor and some additional chiller rooms.

4.1.3 Northern Territory

The situation in Northern Territory has changed considerably in mid 2010. A recent pre-feasibility study for a Northern Australian dual-species (camels and cattle) abattoir (Neithe, 2009) concluded that such a facility would be of benefit to the local beef producers. Consequently, several firms have begun to develop plans to recommission or construct abattoirs in the Northern Territory. The mothballed Katherine abattoir has been the subject of a bid by a Darwin based company which planned to focus on producing meat for export through that port.

This renewed interest in processing is being driven primarily by the indications from Indonesia that it will be moving towards self-sufficiency in meat production, by reducing the import of slaughter cattle. Indonesia is expected to continue importing feeder cattle, leaving a niche for local processors to gain access to larger numbers of cattle no longer acceptable to the dominant live customers.

There is similar interest by some producers in the Kimberley Region in developing commercial processing, but as yet no clear expressions of intent have been made by established commercial operators or marketers. The Northern Territory offers a slightly more tempting environment for an abattoir development than northern Western Australia. Katherine is at the centre of a large beef production area and is a gateway to Darwin, only 320km distant. Processing in this area would achieve freight advantages over the live trade, and provide an outlet for pregnant females, cracker cows and heavy steers for which no cost-effective alternative market exists.

The changes in the Indonesian live trade, plus the addition of camels into the slaughter mix, offers the opportunity to increase the annual slaughter throughput over the low levels in the 1990s (average 31,000 per annum) in the post-BTEC period which precipitated the abattoir's closure.

4.2 **Commercial, economic and strategic issues**

4.2.1 Risks

The creation of a processing alternative stream carries many risks for the proponents. The changing nature of Australian meat processing, points to the concentration of processing activity into a small number of large facilities. Investors in a new regional abattoir would face competition from larger, more efficient facilities with easier access to export markets.

Reliability of supply would be a major issue, given the strength of the live trade and the potential for exogenous factors (such as currency fluctuations and sea freight price differentials) to favour the live trade over processed meat from time to time. Any short term swing towards the live trade could bring about the need for closure or shutdowns for the abattoir, which obviously are commercially highly undesirable. While-ever live trade dominates production output in the Rangelands; any abattoir would face this type of risk to its capacity to generate return on significant amounts of capital needed for development of the option.

It is becoming clear that a new abattoir would also need to be considered as a part of a revitalised supply chain, rather than simply a standalone commercial asset. To attract the required daily cattle intake to generate revenue quality, abattoir operators would depend on relationships with producers working with cattle in a range of stages – breeding, weaning, backgrounding, growing out etc, as well as transporting and handling. To achieve reliability through a chain of this nature, the abattoir operator would need to have developed alliances or similar commercial agreements with participants in these activities, delivering grown-out cattle in consistent numbers through a range of climatic conditions.

The abattoir operator would need to be confident that it had claim over sufficient cattle numbers on hand or within an easy haul of the facility ahead of the wet season in the tropics, during which time long distance transport of cattle from inland pastoral properties is often inhibited. It would therefore need to invest in alliance agreements with the owners of the properties providing the growing out services, along with other operators holding cattle at different stages of the chain.

This approach would be difficult to pursue in an environment where live trade competes opportunistically with the processing stream, within which an animal may require the investment in another 1-2 years of growth (beyond the live export sale age) before generating a return to the various producers bringing it to maturity.

It is hard to envisage a substantial processing stream generating commercial acceptable returns to investors in this environment. The live export 'tap' can be turned on and off fairly easily by producers in response to market conditions and customer practices. By contrast, the processing stream, once turned 'on', cannot be turned 'off' very often or for very long.

In terms of the large area under consideration, over 2000km long by road distance, it is unlikely that any one location for an abattoir could draw cattle away from the existing alternatives in each region – the live trade in the north, and southern processing option for the south. An abattoir in the northern Rangelands will not be competitive with the existing stream based on supply to Harvey Beef, while a southern Rangelands abattoir would not command much interest from Kimberley producers where transport journeys are much longer than the short distance to the live ports (unless trading conditions change markedly).

4.2.2 Advantages

Notwithstanding these issues, there would be substantial advantages for the overall industry in the creation of a processing stream:

Reduced exposure to dominant customer

- This is particularly significant to the Kimberley region. The dominance of the Indonesian consumers leaves the region's producers with very little market security and a difficult business and investment environment.

Incentive to invest in a cohesive backgrounding and value adding industry

- A confirmed abattoir development would provide the backbone for the development of a new backgrounding sector, whereby cattle producers and other landowners could invest in irrigation or utilise coastal rainfall to provide growing out capacity that would benefit both the live export and meat trades.

Incentives to improve management practices

- Aligned with the previous point, producers previously focused on the live trade would be challenged to manage their cattle's growth in order to reach premium weights for the abattoir. This could involve commercial alliances with backgrounding service providers. These alliances and

services would lead to improved professional attention to supply chain efficiency which would eventually result in improved returns.

Ecological benefits

- There are currently an estimated 60,000 cattle of little or no value to the export trade roaming on Rangelands pastoral properties. These cattle are contributing to the damage being done to natural grasslands and reducing the effective value of the carrying capacity of the land. A processing chain would absorb most of these animals (pregnant females, cracker cows etc) and create more space for more valuable cattle.

Regional economic benefits (investment, employment generation, indigenous opportunities)

- An abattoir would employ up to 200 people and generate considerable flow-on benefits into the regional economy, and that of its host town. Associated industrial and tertiary sector businesses (equipment maintenance, infrastructure, freight and logistics, training and human resource management) would benefit from the association with the new business. In principle, the replacement of a trade in exporting live animals with a manufacturing enterprise would be of considerable value beyond its immediate commercial returns.

4.2.3 Supporting a processing option

A new abattoir can readily be built in any number of locations, and will be of benefit to local and regional producers seeking an alternative option to the live trade or southern processing option. Once established, the operation would no doubt claim a base-load kill volume from producers keen to re-orient their operations in pursuit of higher returns from processing than those available from the live trade. This base-load would also include the cracker cows, heavy steers and pregnant females which are being excluded by the live trade.

This base-load, however, would not be steady, reliable or of sufficient scale to guarantee that the abattoir could operate at its design capacity. Viability of a processing stream depends on many issues, including availability of co-ordinated feed-on and aggregation services, skilled and unskilled labour, cost-effective transport, and competitive access to market. Above all, however, the steady supply of cattle is the main determinant of commercial success or otherwise.

Every recent study into the issue has concluded that processing would be of benefit to the industry so long as markets can be found and a steady input stream provided.

A processing chain featuring a new facility(s) cannot be expected to work as an option of 'last resort', behind the live trade. Processing would need to become the dominant stream in the region of the abattoir, with live export as a back-up option. This implies that it would need to feature:

- *Consistent fundamental price differentials over the live trade*
- *Considerable commercial commitment, or ownership involvement, etc, by producers*
- *A significant level of integration along the chain to market*

Established processors will not risk capital in providing a facility that will only be used opportunistically by producers. The status of the live trade into the future cannot be predicted – prices could well improve again once the impacts of the Global Financial Crisis on beef inventories have passed, and changes to Indonesian import policy are always possible. Processors will need some form of security over their supply arrangements to confidently invest in a new facility. This implies that a unique partnership relationship between producers, processor and government might be needed to ensure the stability of a new facility.

4.2.4 Strategic issues associated with a Rangelands processing stream

The Rangelands area is considered too large for a single new facility to make a difference to the entire region. This raises the issue of scale, and the need for an abattoir to be able to command a strong cattle supply from a reasonably close proximity.

A single facility located in the centre of the Rangelands region (i.e. the coastal Pilbara or Newman area) would involve significant transport distances (well over 1000km in some cases) for live cattle movement. While this is not insurmountable, the need for southern Rangelands producers to drive cattle north for slaughter would be counter-productive – as the distance would be similar to those endured in transporting cattle from this area to the existing processors in the south west of the state. Processed product from these abattoirs is closer to market than meat from a centrally located Rangelands abattoir.

The tick line also introduces a barrier to the use of a single Pilbara processing facility. Transporting live cattle across the tick line adds considerable cost in terms of treatments and permits required before transport, and the treatment can devalue the product under certain circumstances. Kimberley cattle would thus incur these costs in accessing southern or central facilities.

Transport cost analysis (see Section 7) and geographical conditions drive the conclusion that separate strategies for the Kimberley and southern Rangelands should be elucidated.

The task ahead is not so much about determining the location of a viable new abattoir, but developing a series of regional strategies towards establishing an improved supply chain, for the benefit of producers seeking the most efficient means of getting optimum cattle types to market (either live or processing).

The Kimberley is sufficiently remote as to warrant its own regional strategy, while the Pilbara/Gascoyne regions are sufficiently contiguous to be connected by a Southern Rangelands strategy.

4.2.5 Mobile abattoirs

A recent study (Neithe & Butler, 2010) reviewed the potential for mobile abattoir systems to be developed for use in the sparsely grazed northern cattle regions. However, the issues of cold chain management, AQIS inspection, labour, effluent disposal and access to power and water make it difficult to conceive of a business cost model that would be viable in competition with normal fixed location abattoirs.

A fleet of mobile abattoirs is unlikely to be able to satisfy the needs of the Northern Australian cattle sector in terms of either capacity or processing cost. However, there may well be an interim or marginal role for entrepreneurs to establish mobile operations. They could well serve a useful purpose in establishing volumes towards a critical threshold where a fixed processing plant becomes viable. These endeavours could be facilitated by government where they involve operations that would be compliant with food and environmental standards

4.2.6 Seasonal processing of camels and goats

The complementary slaughter seasons of cattle with camels and goats have led to suggestions that this model could assist in providing the elusive 12 month supply of slaughter stock for continuous operation of a processing facility. However, while this model has labour cost and retention benefits, it also requires a higher capital base for processing a species other than beef cattle.

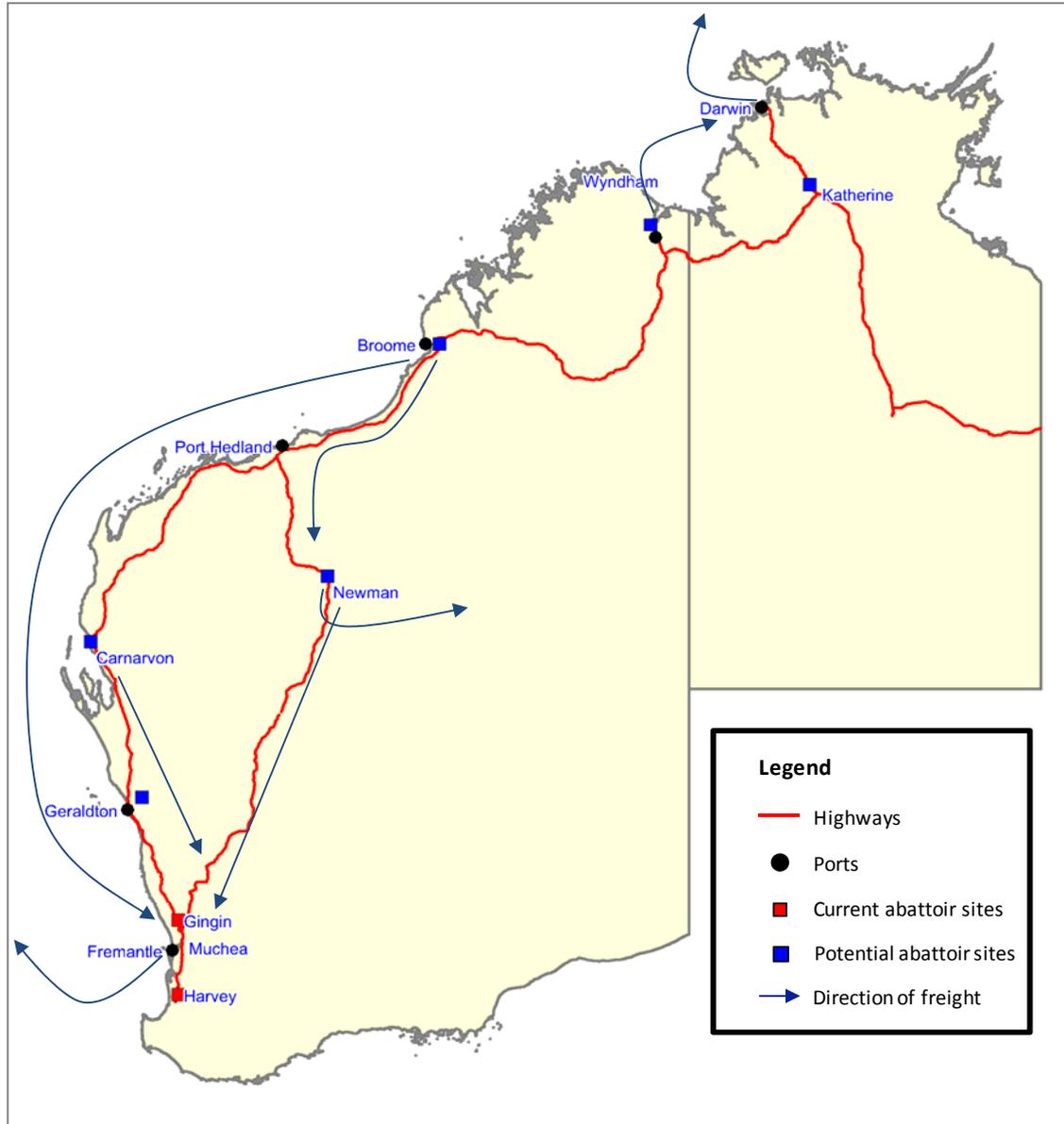
The fundamental economic viability of a facility under this model would be dependent on the cattle numbers available, and attracting the attention of a processor with operational experience and market access. Such a processor would need to determine that a cattle processing stream was viable, and then seek to address the incremental benefits and costs of seasonal processing of a second and third species.

4.1 Abattoir location options

Figure 8 on page 37 shows the sites which were considered in this study for the location of a new abattoir, and indicate the direction of freight (live cattle and processed meat) that would be applicable for each.

The strengths and weaknesses of these sites are considered in this section.

Figure 8 - Potential sites for abattoir development, showing product direction flow



4.1.1 Gascoyne/Murchison

There are limited options for new abattoir development in this region, with Carnarvon being the only population centre of any size at all. Carnarvon is the site of a mothballed meatworks, located 12km north of the town to the north of the Gascoyne River. It is currently owned by a Perth-registered company which has sought interest from Asian importers from time to time, but has no current plans to re-open the facility.

The works is well sited in relation to production zone and local feed sources, but was originally built for the slaughter of goats. To slaughter cattle, considerable new investment in beef slaughter and processing would be needed. The works does not have a rendering plant, and waste was previously burnt on the premises. This approach would not be approved if the works was to be re-instigated today.

The plant, if recommissioned, would most profitably operate as a dual species facility, which would address seasonality concerns regarding cattle, since goat supply is weakest in the winter, when cattle supply is strongest.

Development of a facility here would support a Queensland-style model of gradual value improvement through southward movement towards market.

However, any plans for development of a beef slaughter floor at Geraldton Meat Exports (GME) would affect the viability of a future Carnarvon works, and vice versa. There is unlikely to be enough supply of goats or cattle to support two similar medium scale dual species plants within 400km.

There have also been concerns that any new capacity developed here could have a dampening impact on the viability of Harvey Beef. Some cattle slaughtered at Harvey are bred in the Rangelands and fattened in the northern agricultural zone, before being traded through saleyards.

4.1.2 Pilbara

Location options for the Pilbara area are the major coastal centres of Karratha and Port Hedland, and the inland town of Newman. Of these, the coastal centres would be of sufficient urban scale to accommodate a major industrial employment hub, but direct competition for labour from the mining and bulk logistics sector would tend to drive up operating costs and create labour supply problems. Accommodation in these towns is already insufficient for current and forecast populations, and this does not bode well for a low-margin business such as meat processing.

The town of Newman is a more interesting option, as it is sited towards the southern end of the region, and on the main inland highway to the southern markets – commanding cheaper road freight rates than Port Hedland. Newman is also well sited in relation to mining leases with potential to use mine waste water for irrigation, which could provide capacity to overcome some seasonality problems.

Newman is also an intriguing potential site due to its proximity to mining camps and centres which are occupied by thousands of workers, requiring by one estimate, 1 million meals per year. Pilbara region primary agricultural producers have long been interested in winning supply contracts for these settlements, and meat would be a prime demand product. Current supply arrangements for these settlements, however, are dominated by third party logistics companies, who source basic food staples from around the country in bulk volumes, and store them in Perth-based distribution systems. The dominant supplier for the sector reported for this study that road transport arrangements are typically based on a single weekly truck trip to each centre, carrying dry and refrigerated products, including made-up meals. Meat products are provided to supermarket (HACCP) standard.

While a local meat supplier (e.g. at Newman) could compete for access to this type of contract, its proximity to the mining centres would offer it no particular advantage over suppliers elsewhere in Western Australia, and indeed, other parts of Australia.

Thus Newman could offer some overall freight advantages over coastal locations, for export markets, it is unlikely to be a practical site due to labour and climate issues, as well as concerns over the ability to attract the required daily cattle supply from other regions (outside the inland Pilbara).

A facility at Carnarvon or Geraldton could be of value to much of the Southern Pilbara, by improving the access to a processing option by greatly reducing the live transport distance.

In summary, there is no obvious location for a new abattoir in the Pilbara that could overcome the barriers of labour attraction, scale, freight disadvantage and the need to access export and domestic markets via Perth. A Gascoyne or Geraldton area abattoir would be more likely to attain the overall scale required for viability, since cattle product from the Pilbara and Gascoyne needs to pass through the region to reach market.

4.1.3 Kimberley

The Kimberley region offers considerable strengths as a location for a new abattoir. This is somewhat paradoxical, as it is also the region where the competing live trade has the strongest presence and command over cattle production.

The region's producers are highly motivated by the need for new market options, but remain culturally wedded to the pastoral traditional lifestyle. The beef industry is important economically as well, although it offers less obvious growth opportunity than energy developments currently under consideration e.g. oil and gas at James Price Point.

A rapidly growing indigenous population offers potential for a labour force which is less likely to command 'mining sector-competitive' wages, and which might be able to qualify for training and other forms of government support. Energy project development compensation schemes that might be established for indigenous interests could also be the source of capital for deserving industrial projects.

The region boasts the largest cattle herd in the Rangelands, currently producing around 150,000 head per year for sale. There is some potential to improve on this figure if indigenous managed properties in the region can increase their stocking rates and turn-off through increased professionalism and support.

This area may also qualify for some forms of regional stimulation investment in meat processing due to its unique remoteness and its unhealthy over-reliance on the export trade.

The West Kimberley offers the cheapest access to markets via Perth in absence of viable shipping and air options direct to Asia and Middle East (see Section 7). Broome and Derby are the only two population centres, of which Broome is the largest at 14,000 permanent residents. Broome has a deep water port, and a coastal shipping service. It has a nascent industrial estate on its outskirts which would welcome a major manufacturing development, but there are concerns that the general population would not. The city is focused on its tourism industry as well as the nearby energy developments, and development approvals may be problematic to acquire.

Derby has been mooted as a community more suited to the development, but is hampered by its small population (4,000) and its lack of port facilities, as well as the extra road distance to Perth. Derby does have a major airfreight capability (via Curtin Airbase), which could be useful if direct passenger flights to Asia eventuate on the back of regional developments, but this is of peripheral interest at present. Curtin Airbase also offers land available for industrial use, but this is at present unserviced.

In the East Kimberley, Wyndham is a small port town near Kununurra, with the capacity to host industrial activities associated with its shipping trade on behalf of the Ord River area. Kununurra has only 6,000 people and may be below the level that could reasonably support a modern abattoir, but has some advantages in relation to the sea freight opportunities and proximity to a large cattle production area in the Northern Territory as well as Western Australia. Kununurra also hosts the beef processing facility which closed most recently, and could be considered for re-opening, if water licences etc could be negotiated.

The recent developments re the Katherine, Northern Territory abattoir, if they progress satisfactorily, would tend to militate against an East Kimberley development, since the pool of available cattle would have shrunk.

In summary, the most appealing option for more detailed examination is the Broome area.

Despite closures of many smaller abattoirs in recent times, overall processing capacity in Western Australia is sufficient to meet average demand, but is geographically uneconomic to access for the Northern Rangelands industry. The processing sector is understood to be operating on thin commercial margins.

Threatened changes to Indonesian live import activity have encouraged some interest in re-establishing Northern Territory processing capability, which would benefit Kimberley producers. An existing sheep/goat abattoir near Geraldton is also considering investment in a beef slaughter floor to provide operational synergies. Elsewhere, dual species abattoirs would generally need to be developed around a dependable cattle base-load.

Mobile abattoirs would be unlikely to generate realistic cost-competitive processing options for northern producers, but may be valuable in establishing an interim capacity.

Investment in processing would be a high risk activity, best managed by an existing large scale processor with access to existing and potential markets. Despite the commercial risks, the regional benefits of a processor would be great, more so in the Kimberley than in the Southern Rangelands.

A processing stream could not operate as option of 'last resort', after live export. It would need to be accepted by the industry as the dominant stream for Northern Rangelands production.

Of the potential location options, Broome offers the greatest benefits in terms of labour availability and access to markets.

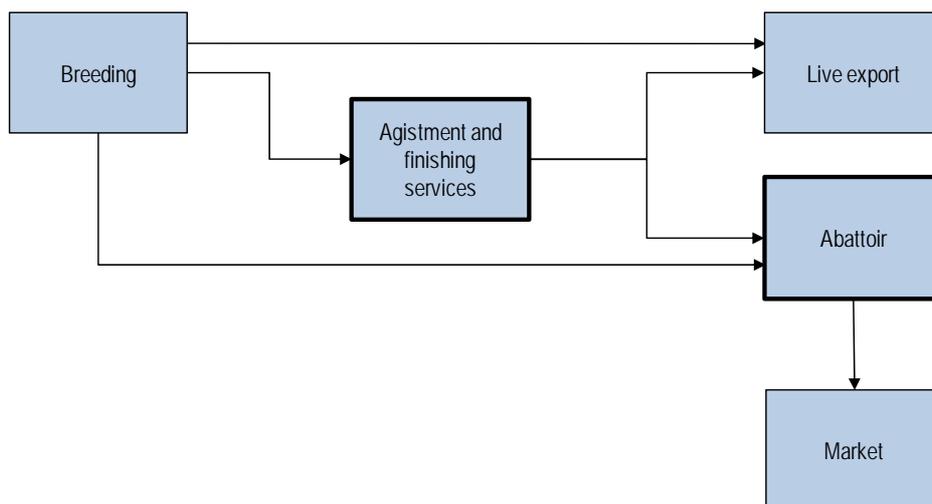
5. DEVELOPMENT OF AN AGISTMENT INDUSTRY

In the course of this study it has become clear that the current state of cattle management in the Rangelands would have to change if a new abattoir was to be successful. The focus on the live trade has led to a very simple marketing process whereby cattle are bred and fattened, by and large, on a single property, mustered and accumulated for sale and shipment. Breeding programs have improved the quality of stock in recent times, but *Bos indicus* cattle, suited to the live trade, proliferate.

A northern abattoir would most likely be invested in as part of a structured move by the industry towards an integrated processing stream. A critical component of such a stream would be the development of an agistment and/or backgrounding sector in the vicinity of the works, as illustrated in Figure 9. This sector would serve the purposes of:

- Smoothing out cattle supply by providing a means of accumulating cattle in proximity ahead of the wet season when mustering is not possible
- Providing a reliable means of fattening animals to the optimum weight despite rainfall problems
- Spreading risk between producers and backgrounding properties

Figure 9 - Necessary enhancement of the simple live export supply chain

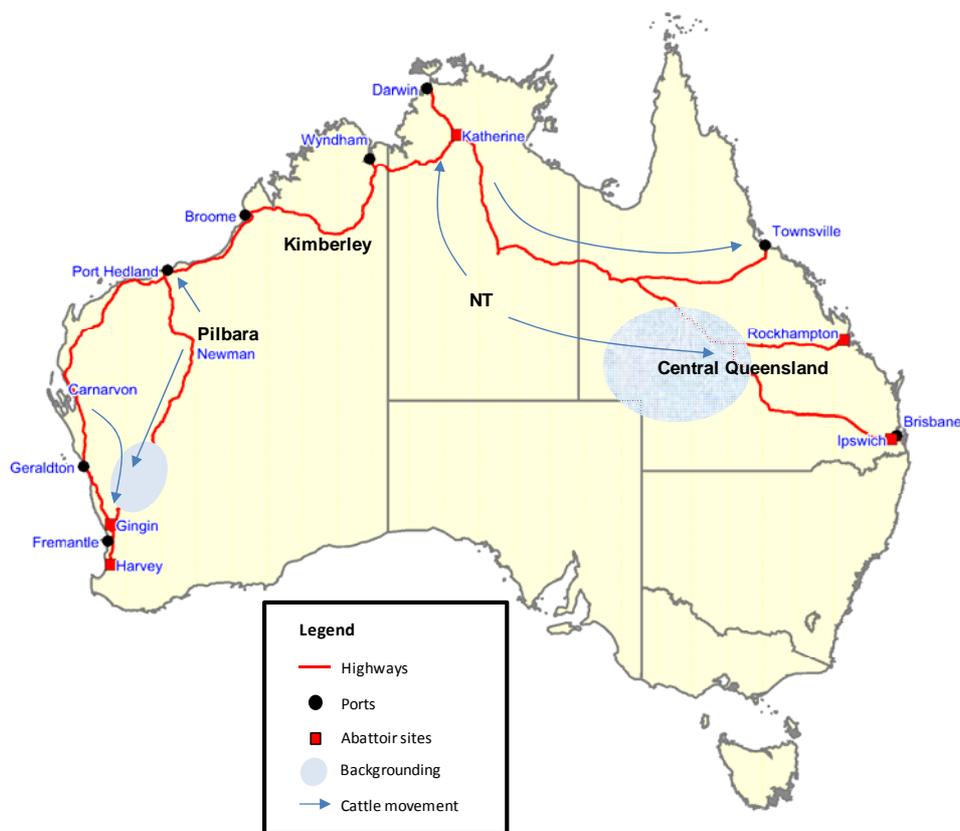


In agricultural regions, this service is provided by feedlots as well as pastoral properties, wherein cattle are fattened on grain, often under intensive accommodation conditions.

There is, however, very little evidence of cattle, from the most northerly areas, being grown out on specialist properties prior to sale at optimum weight. Some investment has been made in irrigation, and some properties now offer intensive use of irrigated fodder crops as a staging point, but the practice is not widespread, and the impediments to the development of pastoral land for this type of purpose are many.

Figure 10 shows how backgrounding is commonly undertaken as part of a long distance, staged journey from breeding property to market, in Western Australia but more substantially in Central Queensland. Cattle from the eastern Northern Territory routinely traverse much of Queensland en route to live export points and abattoirs, via backgrounding properties throughout the southern and central latitudes. The scale of Queensland herd and annual slaughter allows this to be done in a fairly efficient manner.

Figure 10 - Use of backgrounding en route to processing



This pattern is strongly entrenched in Queensland, but much less utilised in Western Australia. There are very few properties north of Geraldton at which backgrounding takes place. There are also no feedlots north of Geraldton, as illustrated by the map at Figure 11, which shows how the Queensland feedlot industry is able to make use of grain supply generated from cropping areas in Central Queensland and the Downs to the south.

The grain growing areas in Western Australia extend only as far north as Northampton, and the cost of freighting grain from those areas to the Pilbara and Kimberley is too high for a traditional feedlot sector to be developed in the tropics.

Other sources of feed such as tropical grasses under irrigation, and horticultural roughage waste have been suggested as alternatives to grain. Irrigation using artesian water is beginning to grow in popularity, but the costs of clearing land and installing centre pivots, for instance, are high, and the process of gaining permits is difficult under current pastoral lands tenure arrangements.

In the Kimberley, increased access to artesian water is being managed via the development of regional water plans, which are in the early stages of implementation. The area of land identified for potential use of this nature to date is relatively small. A zone to the south of Broome adjacent to the Great Northern Highway has been provisionally identified for potential development of irrigation, and some similar zones exist elsewhere. It will, however, be some time before this type of development will be fast-tracked.

There is also considerable doubt as to the viability of this type of activity (irrigation for cattle feeding, or backgrounding in general), as there is little commercial experience with the processing sector in the northern areas. Other commercial crops will compete with fodder for use of any artesian water approved, particularly as water-intensive cropping (e.g. rice) disappears from the Murray Darling Basin.

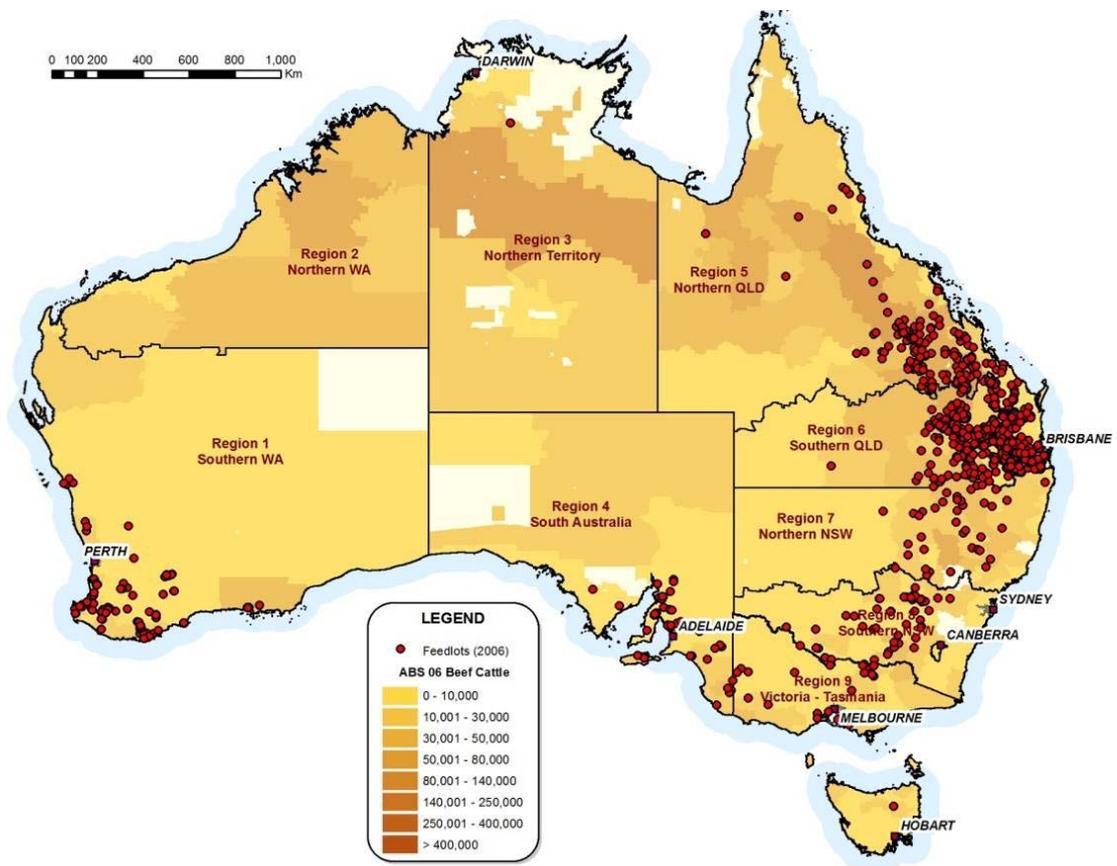
An abattoir development would increase the speed of implementation of an agistment/backgrounding sector in the area. An abattoir capable of handling 100,000 head per year would need the support of an

agistment sector capable of holding up to 25,000 head to maintain supply through the December-March period.

There is no reason this sector needs to be concentrated into a single property or zone. It could equally be made up of a large number of properties with water licences and centre pivots. Investment by producers in this type of capability would be stimulated by a staged public planning process for a processing stream. The most effective way of developing this sector would be for the government to provide incentives for producers and land-owners to invest in this type of activity as part of a regional strategy.

The development of an agistment sector could be identified as a key pre-requisite for an abattoir development initiative. Even if an abattoir is not subsequently constructed, the agistment sector would prove an asset for the local industry in finishing animals efficiently for any market type.

Figure 11 - Feedlot locations in Australia (2006)



Source - MLA (2009)

Development of an agistment/backgrounding industry in the northern region would be beneficial to the cattle producers, providing a basis for future supply chain development, including processing options.

Grain feedlots are not viable in the Rangelands, but greater irrigation and mine dewatering offer potential platform for this development.

Agistment services could be provided in a range of coastal zones and properties throughout the region.

6. MARKET CONSIDERATIONS

6.1 Impact on export prices

The successful introduction of a processing stream would have an impact on the international meat market and Australian exporter performance.

Australia exports around 900,000 tonnes (shipped weight) of beef each year, a figure which has remained fairly steady, although sales to the US have been in decline, balanced by increased sales into SE Asia.

Australia also exports around 900,000 head of live cattle, a figure which has recovered from a serious dip in the middle of the decade (down to below 600,000 head).

World beef consumption has been rising with demographic increases, initially driven by population increases in the developed world, but now more by increased affluence in the developing world. Beef consumption in the developed world fell during the early part of the decade, but has recovered somewhat in recent years. Table 9 illustrates some projections of changing global beef demand, which suggest an ongoing steady role for Australian producers, servicing Asia in particular.

Table 9 - Long term global beef demand projections

Region	Annual growth in total meat consumption (%)		Total meat consumption (million metric tons)		
	1982—94	1993—2020	1983	1993	2020
China	8.6	3.0	16	38	85
Other East Asia	5.8	2.4	1	3	8
India	3.6	2.9	3	4	8
Other South Asia	4.8	3.2	1	2	5
Southeast Asia	5.6	3.0	4	7	16
Latin America	3.3	2.3	15	21	39
West Asia/North Africa	2.4	2.8	5	6	15
Sub-Saharan Africa	2.2	3.5	4	5	12
Developing world	5.4	2.8	50	88	188
Developed world	1.0	0.6	88	97	115
World	2.9	1.8	139	184	303

Source — FAO annual data. Total meat consumption for 1983 and 1993 are three-year moving averages. .

The addition of new processed meat volumes (average 17,500 tonnes – see Section 8) from a new northern abattoir, would increase Australian meat output by around 2%. This would be insufficient to have more than a superficial impact on Australian export prices, but would certainly be a factor in the mix of influences, which include customer perception, global affluence, foreign exchange developments and local and international climatic impacts.

The Australian industry is recovering from a poor year in 2009, with major price reductions, largely relating to the global financial crisis and over-supply in key markets. Australia's strong currency has been a price inhibitor also.

In the long run, the increase in overall global meat production would be minimal, since the processed product would replace some of the live animals currently being exported to Asia. Export prices, however, can be expected to remain volatile into the future, and this will have an obvious influence on processor returns and risk profiles.

6.2 Prices paid to abattoirs

High level cost-modelling for this project is described in Section 8. An abattoir can gain revenue from sales of meat, offal and rendered bi-products. For the purposes of the model, an average price of \$1.50/kg meat at the abattoir gate is assumed. Prices of offal and rendered bi-products are as set out in Table 10.

Table 10 - Recent offal and rendered bi-product prices

<i>Beef Offal</i>	<i>Avg. Wt per animal</i>	<i>Price/kg (May'10)</i>	<i>Price per animal</i>
Tongue	1.69	\$10.11	\$17.09
Skirt	0.72	\$4.05	\$2.92
Tail	0.77	\$5.05	\$3.89
Cheek Meat	1.00	\$3.49	\$3.49
Hearts	1.58	\$1.40	\$2.21
Liver	5.49	\$1.29	\$7.08
Tripe Pieces	9.16	\$2.07	\$18.96
<i>Render Co-products</i>		<i>Price/tonne (May'10)</i>	
Meat and bone meal		\$543.22	
Tallow (<4%FFA)		\$697.50	

Source – MLA periodical update

6.3 Market access

To gain access to Asian and Middle Eastern market, the cost of delivering product from the abattoir must be equal to or better than competitors offering similar products. North western West Australian processors do face some freight cost penalties against other West Australian processors (see Section 7), but Western Australia has sea freight advantages into SE Asia over competing supplier states and nations. Western Australia is freight advantaged into SE Asia and the Middle East, while eastern Australia has good access to Korea and Japan.

The optimum destination for the product will be determined largely by the regions for which a competitive transport chain can be found. The use of extended existing export corridors (i.e. road transport to Fremantle) would lock in higher costs than SW competitors, particular for Kimberley and Pilbara producers. To compete via these chains would lead to reduced returns to producers unless premium consumer prices can be generated through quality and branding strategies.

6.4 A Rangelands processing market

It could be important to producers that any new processing stream available to them did not exclude the benefits of a competitive market operating for the purchase of their slaughter cattle. If a single operator was given control over any new facility in a remote location, there would be a risk that the processor would

secure for itself any price differential margins over competing live export prices, rather than pass these on to local producers. While it is not always possible for vibrant markets for services to operate in remote locations, there are models under which competition between processors could be locked in, to ensure that producers could maximise their returns through the free exercise of choice.

Global demand for meat is being sustained by growth in affluence in the developing world. Western Australia is well positioned to capitalise on new Asian demand. A new abattoir would not add substantially to Australia's meat exports, but could add to current price volatility for Australian processors.

7. TRANSPORT AND SUPPLY CHAIN ISSUES

7.1 General

7.1.1 Reliability of price and service

Access to reliable transport is vital to the location of any abattoir. Reliability in this context pertains to both price and service quality. Freight transport cost is a critical component of the meat supply chain, involved at every stage from the movement of the live animal from the breeding property, through various stages to the processing plant, culminating in the haulage of the meat products to the various domestic and global market destinations. Differences in overall freight costs are significant factors influencing the competitiveness of cattle producers and abattoirs in different locations in Australia and elsewhere.

The remoteness of the potential locations under consideration here makes transport cost and service quality less predictable than in areas where competition between transport suppliers and modes is stronger. In Western Australia, Harvey Beef is located only 150km from the port of Fremantle, on a major highway. It is close to a large area of intensive cattle production and benefits from the availability of multiple road transport suppliers for the delivery of cattle to the facility, and the transport of finished product to the port. Road transport prices are very predictable for a steady freight operation of this nature, and transporter margins are low. The scale of the task is quite significant, and the company can therefore lock in road transport arrangements via long term contracts. The company and its buyer partners are therefore able to factor in transport costs into the overall pricing of product into its markets.

By contrast, an abattoir in a remote district may not be able to command strongly competitive prices, or service reliability, due to the lesser levels of competition between suppliers. Transport charges, on a unit cost basis, will increase with distance of the haulage task, and with demographic sparseness. Road transport in the subject area is the most predictable transport mode, but there is a limited number of suppliers, which means that freight rates will typically be slightly higher than elsewhere, and there are more likely to be instances of shortfalls in capability and operator performance.

An abattoir is a permanent fixture and once established, must rely on whatever transport options are available in that location for the duration of its economic life. Transport options can change over time, particularly where there are few suppliers of road, rail, sea and air transport, and where reliance on backload rates is critical. Road transport is generally available at all potential locations and population centres on the state road network. Sea and air options, however, may change from time to time in response to government shipping policy, ports policy, market forces and commercial decisions by dominant operators. In the subject area of this study, there is currently only one shipping option (from the Kimberley only) and no substantial air freight operations suitable for the purpose.

The choice of location of an abattoir to serve a particular region must take into account these transport risk issues.

7.1.2 Cost of transporting live animals vs. processed product

In general, the transport of processed product will be considerably cheaper than transport of live animals. The closer the abattoir can be located to the areas where cattle are being finished, the cheaper the overall transport cost from pasture to market. Live transport of cattle requires the carriage of the entire animal, in contrast to the haulage of processed meat which is obviously more efficient in terms of space and mass. Live transport also involves logistical and welfare costs related to handling and spelling of the animals, which have significant impacts on overall transport costs. Live animal road transport costs also increase with distance, as truck driver fatigue regulations combine with animal welfare regulations to increase the effective cycle time for the vehicle and driver. Shipping of live animals is also made expensive by the raft of regulations covering the handling of animals prior to and during shipment from Australian ports.

Processed product can be carried on all modes of transport much more efficiently (on a c/kg basis), with the main proviso being the availability of power and equipment for retaining low temperatures in transit and storage, and meeting food safety requirements.

7.2 Road transport – live animals

Road transport is the most common mode for the transport of live cattle on the Australian mainland. There is a rail service linking some Central Queensland saleyards with the major coastal abattoirs, but this service is provided by a subsidised state government enterprise and is expected to shrink in scope in the coming years. All other movements from property to saleyard and abattoir are handled by road transporters.

Road transport utilises purpose-built multi-deck road train configurations to carry large numbers of animals in the standing position. The cost of these services is a function of capital, vehicle utilisation, maintenance cost, fuel and driver time. Distances are often great, and these vehicles travel over roads of varying standards, particularly when affected by seasonal wet weather. Many important routes are unsealed and road maintenance budgets are stretched.

Asset utilisation is affected by the distances travelled and the general lack of backloading opportunities. Cattle originating in northern Australian properties are typically moved in a progressively southerly direction, and towards the coastal centres, for backgrounding, feeding, sale and slaughter or export. There are limited opportunities to capture revenue on return journeys, so the forward journey must cover all costs. These costs are also exacerbated by regulations governing animal welfare considerations. They differ from state to state, and various concessions are available to meet special circumstances, but the need to spell cattle for significant periods over long journeys is an important component of driver time and vehicle cycle time.

Recent efforts by regulators to increase animal welfare provisions have been compounded by similar national efforts to enforce stronger driver fatigue limitations. There has been considerable concern expressed by transporters that the two sets of regulations conflict when applied to livestock transport in some circumstances. Truck drivers and their cargo must rest or be spelled at different points in the long distance journeys, with consequent impacts on overall productivity and efficiency.

National Chain of Responsibility regulations, which serve to increase the spread of risk and responsibility for truck driver behaviour throughout the supply chain, are also driving increased attention to regulatory requirements in driver practice. Volumetric loading concessions apply in Queensland and Western Australia, though not New South Wales. These concessions allow additional mass, and loading based on filling trailers safely and comfortably rather than simple mass measurement. In some states there is pressure to remove some of these concessions on the basis of climbing road and bridge maintenance costs.

The net impact of these recent developments, along with rising fuel prices, is gradual upwards pressure on road freight rates.

7.2.1 Freight rates – live

Actual prices charged for journeys of this nature in Western Australia vary according to the region of origin, the time of year, animal mass, road conditions, permitted vehicle combinations and distance. For the purposes of analysis here, standard rates of \$1.50/deck/km (ex Kimberley) and \$1.25/deck/km (ex Pilbara and Gascoyne) are used to estimate freight costs. These values equate to around 6 cents and 5 cents/km/head respectively, which are also in line with estimate freight rates for similar journeys in Queensland (ALTA, 2008).

7.3 Road transport – processed meat

The transport of meat can be handled efficiently via two methods:

- Refrigerated vans – meat is packed in cartons and/or palletised and hauled to cold stores or container packing facilities
- Shipping containers – packed at the abattoir for transport direct to port for international customers

Processed meat can be carried more cheaply than live animals in the West Australian beef supply chain for several reasons.

Carriage of live animals involves the haulage of over half of the animal's mass which will not be part of the finished product. Typically the amount of saleable meat will constitute around 40% of the animal's live weight, which means that around half of the freight vehicle's capacity is wasted. The complications arising from welfare implications of hauling live animals are also avoided with meat haulage. The cost of refrigerated transport and storage, as well as fulfilment of obligations under food safety regulations, is the only area of cost disadvantage for processed products.

The major benefit of haulage of processed meat is the ability to capitalise on backload rates available for van transport on the north-south corridor. The dominant direction of refrigerated freight is to the north, carrying food and provisions for the regional centres and mining camps from distribution centres in Perth. There is considerable freight space available for abattoir products to be transported into Perth for the domestic market or export via Fremantle.

Backload freight rates will be consistently available for meat product heading towards Fremantle from northern areas, though they will be more subject to rise and fall than forward freight rates, since they depend to some extent on the existence of other back freight opportunities that might arise from time to time. This is particularly so since there are only very small number of freight companies offering this type of service in the region, and there is a single dominant supplier.

The use of refrigerated vans for export tasks necessitates a transfer of the consignment to container via a packing service, typically located close to the port. This adds a cost and time component which can be alleviated by the use of containers for the whole journey from the abattoir. Under this system an empty container is delivered from a container park near the port to the abattoir, either left on site for packing, or packed in situ on the truck, for return full. The disadvantage of this mode, however, is that backload rates are not applicable, as the movement of the empty container takes up the space on the north-bound leg. This additional freight charge would outweigh the savings made through avoiding the trans-shipment costs.

There is also a difficulty in reliably sourcing empty containers from the port for long distance freight hauls. Food grade container shortages occur from time to time and shipping lines and freight forwarders often allocate them to more local tasks to improve container utilisation.

In summary, van freight most likely offers the most attractive form of road transport available for processed product from a northern abattoir.

Table 11 - Road distance matrix (km)

<i>Potential site</i>	<i>Perth</i>	<i>Darwin</i>
Wyndham	3,172	929
Derby	2,339	1,735
Broome	2,186	1,872
Port Hedland	1,650	
Karratha	1,563	
Newman	1,197	
Carnarvon	930	

7.4 Sea freight

7.4.1 Coastal services

For processed product, sea freight options for connection to Perth and Darwin exist for the Kimberley Region. A shipping service is currently provided by Jebsons Shipping under contract to the state Government. The multi-purpose ship is required to service Broome and Wyndham, but also currently calls at Darwin, delivering cement product ex Perth. This service operates on a maximum 17 day schedule.

The purpose of the service is to provide competition for road freight transport and provide price options for deliveries into the Kimberley and export products out. The service is operated under short term (2 year) contracts, although the current operator will have options to extend for two three year periods post 2012.

The operator has the responsibility to attract customers for the service, and must juggle competing customer needs with available space, as well as seasonality of certain agricultural export tasks.

There are no such options serving ports in the Pilbara and Carnarvon regions at present. As the regional economy grows in response to energy and mining developments, some shipping lines are investigating opportunities to introduce new services, particularly linking Western Australia with Asian ports, but these remain speculative at present.

Sailing frequency for any new Asia services, however, may be a problem, with weekly or fortnightly schedules likely. Reliance on a single operator (and ship) would also reduce confidence in the ability to meet market needs. These small scale services are likely to be more expensive than the established liner services from Fremantle, but may prove most cost-effective when road or sea freight transfers to Fremantle are taken into account

The output of an abattoir would be an attractive business for the shipping line, and it would offer road-competitive rates to Fremantle for transshipment to export markets. The low frequency of the existing service, however, would require the ability to hold up to 17 days production at the abattoir or port area, either through cold stores or refrigerated container storage. This would have implications for cash flow and payment terms, instituting an average eight days delay in getting product to the international customers, with consequent financial costs to the business.

The other downside of committing, through an abattoir location decision, to a coastal shipping service as provider of the core transport service, is that the service is subject to ongoing short term subsidy contracts with the WA State government, and cannot therefore offer long term security of service or price.

7.4.2 Coastal sea freight rates

Indicative rates have been sought from the current operator of the service for the purposes of this report. The dominant direction of freight is south-north as per road freight, but backload discounts are minimal, as the same deck space is taken up by the container whether it is full or empty.

Table 12 - Indicative coastal sea freight rates

<i>\$/TEU</i>	<i>Fremantle</i>	<i>Darwin</i>
Broome	\$2,500	\$4,800
Wyndham	\$4,000	\$4,400

Source – *Jebsens Shipping (conversation)*

These rates compare favourably with the road freight rates nominally available for the journey to Fremantle, and are lower than road rates to Darwin. Overall, the cost of freighting a container to an international port is lower for Fremantle than Darwin, despite the greater distance. This is a function of the current and projected mix of traffic using the service, and the relationship with road freight rates – shipping is a ‘price-taker’ on this corridor.

These indicative prices are not stable, or reliable indicators of future sea freight service prices, since the mix of traffics available and the commercial approach of the ship service operators is subject to considerable change over time.

7.4.3 International sea freight

Sea freight is the most common mode used for Australian meat exports. Around 0.9 million tonnes of beef is exported annually via Australian ports, of which Fremantle accounts for only 3% (MLA, 2009, DAFWA, 2008). As a major Australian hub, Fremantle also boasts frequent sailings to SE Asia and the Middle East (close to daily) by a variety of shipping lines and there is a good level of competition for freight as a result.

Darwin has advantages as a hub for northern Australian trade into Asia, but is yet to gain critical mass regarding volumes that attract shipping lines. It is unlikely to be able to attract southern Australian export container freight from the southern ports, despite its modern rail link, due to the great distances and high cost of land transport in comparison with sea freight rates

Table 13 - Indicative international sea freight rates

<i>Fremantle-Singapore</i>	\$2,000
<i>Darwin-Singapore</i>	\$4,000

Source – *Shipping Company conversation*

It should be noted that international container freight rates can vary considerably over time, according to global trade conditions and the state of shipping capacity. There are indications that box rates for the Asian-Australian trade are on the rise again after a depressed period during the Global Financial Crisis.

7.5 Air freight

Considerable volumes of chilled meat are exported from Australia by air, on commercial passenger flights from the major airports. Chilled meat attracts higher prices than frozen meat, particularly in the more affluent markets, and air freight allows delivery timelines that support chilling. Such products can be landed in key Asian centres for well under \$1/kg.

Opportunities to use air freight from remote locations, however, are limited and likely to be transitory (or opportunistic). There are plans for commercial flights into Asia from some north-western West Australian airports and these may increase with new regional energy developments in the pipeline.

Use of airfreight, however, is only justified by the better quality cuts of meat, rather than the entire carcass.

Full time lease of a cargo jet to access nearby Asian destinations offers some attraction. It would eliminate all landside and sea freight connections, and move chilled products directly and quickly into Asian destinations not well served by sea. Unfortunately, however, it is difficult to see how this could be achieved for less than \$3/kg, and would have several attendant risks. The existence of a steady market to accept this volume of high priced meat would also be problematic.

There would be occasional opportunities to capitalise on spare air freight space on passenger services linking Perth with Kimberley and Pilbara centres. South-north is the dominant freight movement direction on this corridor as per other freight modes, and backload rates would apply to the use of return freight space on the southern movement to Perth, for trans-shipment to international services.

Indications are that this method could be a realistic means of getting small volumes of high value meat to market, with the bulk of production using orthodox road and sea transport.

As with other modes, air freight rates into Asia from Perth are likely to be cheaper than Darwin options.

7.6 Transport summary and analysis

North West Western Australia boasts proximity to South East Asia, which should, prima facie, give its cattle industry a significant competitive advantage over other production regions. Jakarta is 2100km from Broome, and Singapore is 2900km distant, compared with the 2200km road distance to Perth. The concentration of Australian transport efficiencies into capital centres, however, means that this advantage cannot be capitalised on at present. Even Darwin, which boasts a new port and rail corridor, cannot compete with Perth or Brisbane on sea or air freight charges. The isolation of the Northern Australian centres from the main southern population centres and the high costs of land transport relative to sea freight ensures that they will never fill the role of northern gateways for southern Australian freight.

The only traffic type for which these northern areas have a clear advantage is specialist live animal shipping. These vessels are chartered for specific point to point movements from general break bulk wharves which do not require expensive wharf loading gear. Freight rates for live shipping from the northern ports into Asia reflect its strong advantages over the southern ports. This combined with the lack of access to international container freight shipping, accounts for the dominance of the live trade, which grows with northward distance.

The northern production areas will need to hub their processed meat products via Fremantle in order to access international markets via sea or air freight. This places them at an immediate disadvantage in relation to SW zone producers, which have easy access to Fremantle via the Harvey meatworks, only 150km to the south east of the port. On the positive side, the existence of consistent backload freight pricing for road and coastal sea freight, from the Kimberley in particular, means that the freight disadvantage between the zones is not great.

The cost of transporting processed meat is far lower than that of transporting live animal equivalents (in c/kg of meat). This is reflected in the analysis below which seeks to compare (on an indicative basis) the freight costs associated with potential abattoir developments at different locations in the subject region.

The costs of hauling cattle into hypothetical abattoirs in each location, and then carrying processed meat to export locations are modelled in the simple analysis outlined below.

To calculate these costs, distances and freight rates are used to complete matrices of freight costs of different types applying to the producers in each region, with respect to different abattoir locations. These costs are then compared to the freight costs that would be involved in the transport of live cattle for processing at Harvey Beef, for transfer to Fremantle for export. They are also compared to the freight costs faced by producers in south western West Australia, delivering their cattle to Harvey Beef for processing and export.

The modelled freight costs associated with abattoirs in different locations are then compared with freight costs associated with live export from each region.

Assumptions:

Some basic freight rate assumptions are made regarding the costs per km of live haulage in different regions:

- Kimberley region rates are usually quoted at around \$1.50/deck/km, while rates in more southerly districts are currently quoted at \$1.25/deck/km, reflecting road quality, terrain, and market factors.
- Freight rates for frozen or chilled products are based on indicative quotes received from current freight operators
- Where road freight rates for refrigerated vans are used, with an additional charge for packing into containers and movement to the dock
- Where coastal shipping freight rates are used, containers are transhipped directly to international shipping with no significant cost
- Haulage distances from each production region to abattoir sites or live export ports are indicative, as the production regions are very large and properties within a region can range from 50-500km from the nearest such centre
- Common elements such as loading costs and storage costs associated with transport have not been modelled.

7.6.1 Freight cost modelling – comparison of new abattoir with existing facilities

The following tables show the road distances and freight rate estimates that underpin the freight cost analysis:

Originating area	Distance (km)					
	Live transport to potential abattoir sites					
	Wyndham	Broome	Newman	Carnarvon	Geraldton	Harvey
Kimberley E	250	800	1800	2250	2700	3100
Kimberley W	800	250	1250	1700	2200	2600
Pilbara central	2000	1200	300	950	1000	1550
Gascoyne	3000	2200	400	300	600	1100
South west						150

Originating area	Freight rate (\$/deck/km)					
	Live transport to potential abattoir sites					
	Wyndham	Broome	Newman	Carnarvon	Geraldton	Harvey
Kimberley E	1.5	1.5	1.5	1.3	1.25	1.25
Kimberley W	1.5	1.5	1.5	1.3	1.25	1.25
Pilbara central	1.5	1.5	1.25	1.25	1.25	1.25
Gascoyne	1.25	1.25	1.25	1.25	1.25	1.25
South west	1.25	1.25	1.25	1.25	1.25	1.25

These tables calculate the road freight costs for each production area-abattoir option, and the additional costs of transporting processed product to export port location by road or coastal sea freight (where available). Freight costs in all cases are reduced to c/kg meat for comparison:

Road freight (\$/head-lwt)						
Live transport to potential abattoir sites						
Originating area	Wyndham	Broome	Newman	Carnarvon	Geraldton	Harvey
Kimberley E	15	48	108	117	135	155
Kimberley W	48	15	75	88.4	110	130
Pilbara central	120	72	15	47.5	50	77.5
Gascoyne	150	110	20	15	30	55
South west						7.5

Road freight (c/kg)						
Live transport to potential abattoir sites						
Originating area	Wyndham	Broome	Newman	Carnarvon	Geraldton	Harvey
Kimberley E	9.38	30.00	67.50	73.13	84.38	96.88
Kimberley W	30.00	9.38	46.88	55.25	68.75	81.25
Pilbara central	75.00	45.00	9.38	29.69	31.25	48.44
Gascoyne	93.75	68.75	12.50	9.38	18.75	34.38
South west						4.69

Freight to port (\$/20 tonne consignment)						
Processed meat abattoir to port						
Mode	Wyndham	Broome	Newman	Carnarvon	Geraldton	Harvey
coastal - Fremantle	4400	2750				
coastal - Darwin	2200	4400				
road - Perth	4700	3300	2400	2060	1300	500
road - Darwin	2700	5900				
live sea transport						

Freight to port (c/kg)						
Processed meat abattoir to port						
Mode	Wyndham	Broome	Newman	Carnarvon	Geraldton	Harvey
coastal - Fremantle	22	13.75				
coastal - Darwin	11	22				
road - Perth	23.5	16.5	12	10.3	6.5	2.5
road - Darwin	13.5	29.5				
Mode	Processed meat sea freight to Asia					
Singapore ex Fremantle	10	10	10	10	10	10
Singapore ex Darwin	20	20	20	20	20	20

These tables calculate a through cost for containerised meat product from each production area to Singapore via the competing abattoir location options. The lowest cost option for each production region is highlighted in yellow. These costs are then compared with notional (estimated) costs incurred by the South West beef producers in getting processed products to market via southern beef abattoirs, to illustrate the competitive freight disadvantage that a northern abattoir would face in relation to existing West Australian processed meat exporters:

Originating area	Freight to Asia via Fremantle (c/kg)					
	Overall freight cost to Singapore via abattoir at:					
	Wyndham	Broome	Newman	Carnarvon	Geraldton	Harvey
Kimberley E	41.38	53.75	89.50	93.43	100.88	109.38
Kimberley W	62.00	33.13	68.88	75.55	85.25	93.75
Pilbara central	108.50	71.50	31.38	49.99	47.75	60.94
Gascoyne	127.25	118.25	34.50	29.68	35.25	46.88
South west						17.19

Originating area	Advantage of new abattoir over transport from Rangelands to Harvey for processing (c/kg)					
	Freight differential					
	Wyndham	Broome	Newman	Carnarvon	Geraldton	Harvey
Kimberley E	68.00	55.63	19.88	15.95	8.50	
Kimberley W	31.75	60.63	24.88	18.20	8.50	
Pilbara central	-47.56	-10.56	29.56	10.95	13.19	
Gascoyne	-80.38	-71.38	12.38	17.20	11.63	
South west						

Originating area	Disadvantage against SW producers using Harvey processing (c/kg)					
	Freight differential (abattoir locations vs Harvey area producers)					
	Wyndham	Broome	Newman	Carnarvon	Geraldton	Harvey
Kimberley E	-24.19	-36.56	-72.31	-76.24	-83.69	
Kimberley W	-44.81	-15.94	-51.69	-58.36	-68.06	
Pilbara central	-91.31	-54.31	-14.19	-32.80	-30.56	
Gascoyne	-110.06	-101.06	-17.31	-12.49	-18.06	
South west						

The key outcomes of the analysis are that:

- Northern producers with access to a local abattoir could gain significant freight cost advantages over the current cost of long distance transport of live cattle to southern processors; and
- The competitive (freight) advantage of the south-western processed meat chain over potential northern processed meat supply is quite low, for production areas with a nearby abattoir.

7.6.2 Freight cost modelling – comparison with live trade

A new abattoir will offer freight cost advantages over the live trade, due to the greater costs involved in transporting live animals by road and sea (particularly since the live transport includes at least 60% of lower value product (offal, bone etc). These tables seek to estimate the freight advantages in relation to the trip from production area to Singapore.

The first set of tables show costs calculation of estimated live export freight from current live trade ports to Indonesia and Singapore:

Road freight (\$/head-lwt)					
Live transport to live port					
Originating area	Wyndham	Broome	Port Hedland	Geraldton	Fremantle
Kimberley E	15	48			
Kimberley W	48	15			
Pilbara central	120	72	12.5	50	60
Gascoyne			45	30	50
South west					12.5

Road freight (c/kg meat)					
Live transport to live port					
Originating area	Wyndham	Broome	Port Hedland	Geraldton	Fremantle
Kimberley E	9.38	30.00			
Kimberley W	30.00	9.38			
Pilbara central	75.00	45.00	7.81	31.25	37.50
Gascoyne			28.13	18.75	31.25
South west					7.81

Live sea freight (\$/head)					
Live shipping from					
	Wyndham	Broome	Port Hedland	Geraldton	Fremantle
Indonesia	80	80	100	120	130
Singapore	120	120	130	140	150
Equivalent (c/kg meat)					
Indonesia	66.67	66.67	83.33	100.00	108.33
Singapore	100.00	100.00	108.33	116.67	125.00

The following tables calculate a comparison between the live export costs and processing costs via an optimally sited abattoir for each production region:

Freight to Asia live (c/kg)					
Overall freight to Indonesia (live) via:					
Originating area	Wyndham	Broome	Port Hedland	Geraldton	Fremantle
Kimberley E	76.04	96.67			
Kimberley W	96.67	76.04			
Pilbara central	141.67	111.67	91.15		
Gascoyne				118.75	139.58
South west					116.15

Broome abattoir - freight cost differential (c/kg meat)					
Processed cost to Asia minus live export cost via live ports:					
Originating area	Wyndham	Broome	Port Hedland	Geraldton	Fremantle
Kimberley E	-22.29				
Kimberley W		-42.92			
Pilbara central			-19.65		
Gascoyne				-0.50	

Wyndham abattoir - freight cost differential (c/kg meat)					
Processed cost to Asia minus live export cost via live ports:					
Originating area	Wyndham	Broome	Port Hedland	Geraldton	Fremantle
Kimberley E	-34.67				
Kimberley W		-14.04			
Pilbara central			17.35		
Gascoyne				8.50	

Carnarvon abattoir - freight cost differential (c/kg meat)					
Processed cost to Asia minus live export cost via live ports:					
Originating area	Wyndham	Broome	Port Hedland	Geraldton	Fremantle
Kimberley E	17.38				
Kimberley W		-0.49			
Pilbara central			-41.16		
Gascoyne				-89.08	

These results show that regions with their own abattoirs would enjoy lower freight costs (as expressed by negative differentials above) than currently experienced with the live trade from their home ports. For instance, a Broome abattoir would offer a \$0.43/kg meat freight saving over the direct live freight to customer port, despite having to utilise a much longer journey to market. A Gascoyne area producer with a Carnarvon abattoir would make a \$0.89/kg meat saving over live export via Geraldton.

7.7 Transport issues - commentary

The analysis reflects the key point that transport of processed product is much cheaper than live animals. The abattoir locations that deliver the best freight cost outcomes in comparison with the existing alternatives are those which minimise the distance travelled by live animals, and capitalise on favourable road and sea freight rates for processed goods in a southerly direction.

These differentials are fairly significant indicators to the question of how a new processor might capture a slice of the market for meat products.

While the producer selling an animal to an exporter or processor does not pay the freight costs for the carriage of the processed product or the sea freight, these freight costs are netted off the price received by the producer. The freight cost advantages of the processed chain over the live chain are important to the overall marketability of the processed product, and to the location decision.

While road freight costs are fairly predictable, sea freight charges for export products vary over time as a result of terms of trade, global trading health, shipping availability and commercial decisions of shipping lines and ports. One of the challenges for this project is that the differentials between sea freight rates for live cattle and processed meat could swing dramatically due to global factors. Live carriers are special purpose vessels, belonging to a relatively small global fleet, which responds to a narrow range of variables more or less specific to the live trade. Container vessels suffer from the vagaries of the general freight trade and the volatile imbalance between overall capacity and demand. The costs of container freight on the Asian-Australian trade are likely to increase once more as the global economy improves, until new capacity depresses prices once more. Live trade vessel costs are less susceptible to these types of trends, but more likely to be affected by regulatory changes e.g. animal welfare concerns, or by decisions by importing countries to 'turn off' the live trade, thus increasing available capacity.

An abattoir competing with the live trade for supply of cattle will face this changeable differential with limited ability to respond to any changes in favour of the live trade.

Notwithstanding this uncertainty, an abattoir should be able to compete on freight terms with the live trade in its production region if sited appropriately with respect to transport nodes. Any freight benefits, however, diminish with distance from the abattoir.

Freight cost is a vital and substantial component of price of getting processed meat to market. A processor in the Kimberley region, however, would benefit from access to low road and sea freight rates in competing with other Australian processing streams.

The cost of transporting processed meat is far lower than live animal freight cost. This provides an advantage to processors over live export trade, which balances some of the current disadvantages.

Broome as a location takes advantage of backload road freight rates into Perth, and a regular state-supported shipping service. Freight costs into Asia via Darwin are non-competitive with those ex-Fremantle at present.

8. ABATTOIR DESIGN AND ECONOMICS

In the modern Australian meat industry, conventional wisdom is that any new abattoir should be built to handle a minimum 400 head per day. Construction of anything smaller will not cost much less to build, but the smaller throughput would result in higher unit costs of production. Some small operations are surviving, particularly in the domestic market, but the trend towards large facilities located close to coastal centres and export locations has been very strong.

The reasons for this pertain to the high fixed costs associated with the different processes involved in slaughtering animals, preparing meat, packaging, despatch and handling of offal. The costs of meeting elevated occupational health, export accreditation and food safety standards are also fairly fixed i.e. not much different for different sized operations.

The other reason for building as large a facility as possible is that a modern abattoir is most likely to be profitable if it can provide the full range high and low value cuts from each animal slaughtered, and effectively market this capability. This differentiates the model from a simpler wholesale slaughterhouse, which on-sells quartered carcasses to other chain participants and retains little value-add potential.

The downside of building a large comprehensive abattoir in an area dominated by the live trade is that the reliable supply of a minimum 100,000 head per year is problematic. The risks of any consistent failure to compete for the dominant share of annual turnoff in the Rangelands would be great, given the high capital cost and fixed operating costs associated with a facility of this nature.

The alternatives, however, are not compelling. They can be summarised as follows:

<i>Abattoir model</i>	<i>Strengths</i>	<i>Weaknesses</i>
Slaughter only	Lower construction cost and labour costs Less exposure to capital risk	Higher freight costs (carcasses vs packaged meat) Lower value product, inability to generate strong returns on premium cuts
Smaller comprehensive abattoir	Marginally lower capital costs and labour costs Minor reduction in capital risk	Lower output Higher unit costs Overall lower profitability potential
Hot-boning plant	Lower capital cost (chillers) Significant labour reductions (25-30%)	Lower value product, inability to generate strong returns on premium cuts Potential to limit export markets
Mobile slaughter vehicles, servicing a central regional storage and boning operation	Flexible, can manage supply problems	Equally susceptible to hot, wet weather issues Low daily output Requires local permanent cold storage and boning operation due to limited chilling capacity
Mobile slaughter staff using different slaughter premises and a port-based boning plant	Flexible, can manage supply problems Greater capacity boning function possible	High capital cost in multiple slaughter floors High labour accommodation and management costs

This cost estimate is based on the conventional 400 head per day abattoir on the basis that it will provide a benchmark cost against which the less substantial abattoir models could be tested.

8.1 Capital cost estimate

The plant would commence operations at up to 50,000 cattle per year and would be designed to handle increasing throughput on a daily 8 hour (7.6 working hours) shift, 5 days per week, 50 weeks per year, equivalent to 250 working days per year.

Initial Plant Throughput 200 cattle per day

Viable Plant Throughput 400 cattle per day

The design is based on the requirements for an export licence from AQIS to comply with USDA and EU requirements. The plant layout is designed to also meet Halal requirements.

The details of the costing are at the Appendix, along with notional plans for a facility of this scale.

Table 14 - Abattoir capital cost estimate

	Description	Costs
Infrastructure	Mains electrical supply	Excluded
	Mains water supply	
	Water storage and treatment facility	
	Natural gas supply line	
	Sewerage from amenities	
Site works and Building Preliminaries	Earthworks and effluent ponds	\$2,800,000
	Fencing	
	Temporary facilities	
	Soil testing and surveys	
	Roadworks and carpark	
Building works	Yards, holdings and lairage	\$9,650,000
	Main process plant, chillers, freezers, loadout	
	Boiler house, engine room	
	Render building	
	Administration and amenities	
	Workshop	
Process equipment	Main process equipment	\$12,700,000
	rendering equipment	
	Hot water boiler, heat exchangers	
	Plate freezers	
Services	Refrigeration system	\$6,300,000
	Ventilation equipment	
	Effluent treatment and manure handling	
	Piped services	
	Fire services	
	Electrical distribution and control	
This estimate does not include land acquisition and connection to utility services	Sub Total	\$31,415,000
	Design and project management	\$2,400,000
	Total cost of abattoir	\$33,850,000

8.2 Operating cost

The main costs associated with processing are capital and labour. The calculated costs associated with these items have been incorporated into a simple operating cost model (see Table 15) to estimate the overall processing cost associated with this type of development.

In the model, a small share of the capital cost is assumed spent in later years to reflect the ability to partially stage the development. A ramp-up period is also assumed, generating high costs per kg/meat, and therefore commercial losses in the early stages.

Table 15 - Abattoir cost model outcomes (over four pages)

Inputs and cost items	Unit	YR0	YR1	YR2	YR3	YR4	YR5	YR6	YR7	YR8	YR9	YR10
Range of seasonal assumptions			start up years			poor seasons		optimal	range of seasonal conditions			
TASK DEFINITION												
Operating parameters												
Operating months	No.		12	12	12	11	11	12	12	11	12	12
days/week nominal		5	5	5	5	5	5	5	5	5	5	5
days/week actual			5	3	4	3	4	5	3	5	4	5
Operating days pa	No.		250	150	200	137	183	250	150	229	200	250
Shifts per day	No.		1.0	1.0	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Volume of cattle												
- nominal per day	No.		200	300	400	400	400	400	400	400	400	400
- annualised	No.		49,999	44,999	79,999	54,999	73,332	99,998	59,999	91,665	79,999	99,998
- average carcass weight	Kgs/head	250	250	250	250	250	250	250	250	250	250	250
- yield	% carcass weight	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%
Annual Production												
- meat	tonnes		8,700	7,900	14,000	9,600	12,800	17,500	10,500	16,000	14,000	17,500
- offal	tonnes	0.02	1,000	900	1,600	1,100	1,467	2,000	1,200	1,833	1,600	2,000
- rendered product	tonnes	0.082	4,100	3,690	6,560	4,510	6,013	8,200	4,920	7,517	6,560	8,200
Total product mass	Tonnes		13,800	12,490	22,160	15,210	20,280	27,700	16,620	25,350	22,160	27,700

...continued

Inputs and cost items	Unit	YR0	YR1	YR2	YR3	YR4	YR5	YR6	YR7	YR8	YR9	YR10
Range of seasonal assumptions			start up years			poor seasons		optimal	range of seasonal conditions			
ABATTOIR INVESTMENT												
Land + headworks	\$'000	\$2,500										
Siteworks	\$'000	\$2,800										
Buildings	\$'000	\$7,650			\$2,000							
Equipment		\$10,700			\$2,000		\$2,500					
Services	\$'000	\$6,300										
design and project management	\$'000	\$2,400										
Major periodic maintenance items	\$'000						\$1,000					\$1,000
Contingency	\$'000	\$1,000					\$500					
Sub-total; land + headworks	\$'000	\$2,500	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Sub-total; buildings and site works	\$'000	\$10,450	\$0	\$0	\$2,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Sub-total; Plant and equipment	\$'000	\$11,700	\$0	\$0	\$2,000	\$0	\$4,000	\$0	\$0	\$0	\$0	\$1,000
Totals	\$'000	\$33,350	\$0	\$0	\$4,000	\$0	\$4,000	\$0	\$0	\$0	\$0	\$1,000
Cumulative investment	\$'000	\$33,350	\$33,350	\$33,350	\$37,350	\$37,350	\$41,350	\$41,350	\$41,350	\$41,350	\$41,350	\$42,350
DEPRECIATION SCHEDULE												
Write-off												
Land	Years	50										
Buildings and headworks	Years	25										
Plant and equipment	Years	15										
Annual depreciation costs												
Land	\$'000	\$50	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Buildings and headworks	\$'000	\$420	\$0	\$0	\$80	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Plant and equipment	\$'000	\$780	\$0	\$0	\$130	\$0	\$270	\$0	\$0	\$0	\$0	\$70
Annual depreciation	\$'000	\$1,250	\$1,250	\$1,250	\$1,460	\$1,460	\$1,730	\$1,730	\$1,730	\$1,730	\$1,730	\$1,800
Book value	\$'000	\$33,350	\$32,100	\$30,850	\$33,390	\$31,930	\$34,200	\$32,470	\$30,740	\$29,010	\$27,280	\$26,480

...continued

Inputs and cost items	Unit	YR0	YR1	YR2	YR3	YR4	YR5	YR6	YR7	YR8	YR9	YR10
range of seasonal assumptions			start up years			poor seasons		optimal	range of seasonal conditions			
OPERATING COSTS												
LABOUR												
Slaughter staff	No.	30	30	45	56	56	56	56	56	56	56	56
Boning room	No.	60	46	67	78	78	78	78	78	78	78	78
Maintenance	No.	10	5	8	10	10	10	10	10	10	10	10
Administration	No.	16	14	17	28	28	28	28	28	28	28	28
Inspectors	No.	3	3	3	3	3	3	3	3	3	3	3
Total	No.	119	98	140	175	175	175	175	175	175	175	175
LABOUR UNIT COSTS												
Slaughter staff	\$	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000
Boning room	\$	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000
Maintenance	\$	\$55,000	\$55,000	\$55,000	\$55,000	\$55,000	\$55,000	\$55,000	\$55,000	\$55,000	\$55,000	\$55,000
Administration	\$	\$70,000	\$70,000	\$70,000	\$70,000	\$70,000	\$70,000	\$70,000	\$70,000	\$70,000	\$70,000	\$70,000
Inspectors	\$	\$70,000	\$70,000	\$70,000	\$70,000	\$70,000	\$70,000	\$70,000	\$70,000	\$70,000	\$70,000	\$70,000
on-costs	%	39%	39%	39%	39%	39%	39%	39%	39%	39%	39%	39%
LABOUR COSTS												
Slaughter staff	\$'000	\$2,085	\$2,085	\$3,128	\$3,892	\$3,892	\$3,892	\$3,892	\$3,892	\$3,892	\$3,892	\$3,892
Boning room	\$'000	\$4,170	\$3,197	\$4,657	\$5,421	\$5,421	\$5,421	\$5,421	\$5,421	\$5,421	\$5,421	\$5,421
Maintenance	\$'000	\$765	\$382	\$612	\$765	\$765	\$765	\$765	\$765	\$765	\$765	\$765
Administration	\$'000	\$1,557	\$1,362	\$1,654	\$2,724	\$2,724	\$2,724	\$2,724	\$2,724	\$2,724	\$2,724	\$2,724
Inspectors	\$'000	\$292	\$292	\$292	\$292	\$292	\$292	\$292	\$292	\$292	\$292	\$292
Total	\$'000	\$8,868	\$7,318	\$10,342	\$13,094	\$13,094	\$13,094	\$13,094	\$13,094	\$13,094	\$13,094	\$13,094
OTHER OPERATING COSTS	\$'000											
Consumables	\$'000	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500
Power and water	\$'000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
Insurances, statutory	\$'000		\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500
Other	\$'000		\$500	\$750	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
Total	\$'000		\$2,500	\$2,750	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000

...continued

Inputs and cost items	Unit	YR0	YR1	YR2	YR3	YR4	YR5	YR6	YR7	YR8	YR9	YR10
range of seasonal assumptions			start up years			poor seasons		optimal	range of seasonal conditions			
TOTAL COSTS												
Labour	\$'000	\$8,868	\$7,318	\$10,342	\$13,094	\$13,094	\$13,094	\$13,094	\$13,094	\$13,094	\$13,094	\$13,094
Other	\$'000	\$0	\$2,500	\$2,750	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000
Depreciation	\$'000	\$1,250	\$1,250	\$1,250	\$1,460	\$1,460	\$1,730	\$1,730	\$1,730	\$1,730	\$1,730	\$1,800
Interest	10%	\$3,335	\$3,210	\$3,085	\$3,339	\$3,193	\$3,420	\$3,247	\$3,074	\$2,901	\$2,728	\$2,648
Total	\$'000	\$13,453	\$14,278	\$17,427	\$20,893	\$20,747	\$21,244	\$21,071	\$20,898	\$20,725	\$20,552	\$20,542
Annual cattle slaughtered	No.		49,999	44,999	79,999	54,999	73,332	99,998	59,999	91,665	79,999	99,998
Cost per kg	\$		\$1.64	\$2.21	\$1.49	\$2.16	\$1.66	\$1.20	\$1.99	\$1.30	\$1.47	\$1.17
Margin	15%		\$0.25	\$0.33	\$0.22	\$0.32	\$0.25	\$0.18	\$0.30	\$0.19	\$0.22	\$0.18
Imputed price	\$		\$1.89	\$2.54	\$1.72	\$2.49	\$1.91	\$1.38	\$2.29	\$1.49	\$1.69	\$1.35
annual processing cost (less margin)			\$14,278,350	\$17,426,600	\$20,892,800	\$20,746,800	\$21,243,800	\$21,070,800	\$20,897,800	\$20,724,800	\$20,551,800	\$20,541,800
Revenue (abattoir gate)												
Meat	\$/kg	\$1.50	\$1.50	\$1.50	\$1.50	\$1.50	\$1.50	\$1.50	\$1.50	\$1.50	\$1.50	\$1.50
Offal	avge kg/head	20	20	20	20	20	20	20	20	20	20	20
	\$/kg	\$3.00	\$3.00	\$3.00	\$3.00	\$3.00	\$3.00	\$3.00	\$3.00	\$3.00	\$3.00	\$3.00
Rendered bi-product	\$/head	\$33.00	\$1,649,974	\$1,484,976	\$2,639,958	\$1,814,971	\$2,419,961	\$3,299,947	\$1,979,968	\$3,024,952	\$2,639,958	\$3,299,947
Total revenue (abattoir gate)	\$/year		\$17,699,926	\$16,034,933	\$28,439,881	\$19,514,918	\$26,019,891	\$35,549,851	\$21,329,911	\$32,524,864	\$28,439,881	\$35,549,851
Less freight penalty	\$/kg	\$0.17	\$2,276,987	\$2,060,838	\$3,656,378	\$2,509,635	\$3,346,180	\$4,570,473	\$2,742,284	\$4,182,725	\$3,656,378	\$4,570,473
Cash surplus/loss	\$		\$1,144,589	-\$3,452,505	\$3,890,703	-\$3,741,517	\$1,429,911	\$9,908,578	-\$2,310,173	\$7,617,338	\$4,231,703	\$10,437,578
	%		8%	-20%	19%	-18%	7%	47%	-11%	37%	21%	51%

Table 16 below offers high and low staffing estimates for the proposed plant. For the purposes of cost modelling, a mid-range figure has been used.

Table 16 - Labour cost breakdown

Activity	Staff No	
	Minimum	Maximum
Single shift, 5 days/week		
<u>SLAUGHTER</u>		
Slaughtermen	17	23
Follow-On Labour	17	23
Associated Slaughter		
Offal & Tripe	7	7
Yards	2	2
Carcass / Hides / Hooks	5	5
Render	5	5
SLAUGHTER FLOOR TOTAL	53	65
<u>BONING</u>		
Boners	17	23
Slicers	22	29
Packers / Scales	16	22
Chiller / Freezer / Packing / Loadout	4	4
Container & Truck Loadout	10	10
BONING TOTAL	69	88
<u>ENGINEERING</u>		
Engineering / Refrigeration / Services	10	10
<u>SITE ADMINISTRATION (5 day)</u>		
Livestock buying	4	4
Manager	1	1
Foreman	5	5
QA Inspection	5	5
Sales / Transport	4	4
Other	6	6
Security / Medical	3	3
Admin. Sub-Total	28	28
ENG, ADMIN TOTAL	38	38
TOTAL STAFF	160	191
KILL / MAN / DAY	2.5	2.1
<u>AQIS</u>		
Inspectors / Vet	3	3

8.3 Comments and conclusions on the cost modelling exercise

This model is based on several assumptions regarding throughput and animal characteristics, as well as estimates of capital and operating cost elements. By nature it is more simplistic than the commercial experience of an operational business. However, it does serve to illustrate the kind of financial outcomes that might await the operator of a new processing business.

The figures show how strong annual profits could be generated where the steady supply of cattle and the sale of product match exactly the design and staffing capacity of the plant. This is reflected in Year 6, where 100,000 head are processed through a single shift operation in a year, for a substantial 'cash surplus' of 47%. The other years reflect different operating conditions, essentially via reduced days/week worked, and in some cases, a monthly closedown, resulting in lower annual throughput and sales revenue.

A freight penalty is attached to the sales revenues, reflecting the additional cost faced by a Kimberley-based operator, of transporting product to Fremantle for export (over the costs faced by a competing southern processor).

Results vary greatly from year to year, essentially as a function of throughput. Most cost items, including labour, are essentially fixed, or unavoidable in the face of seasonal downturns. Operators typically prefer to scale down production in terms of days/week, rather than shut down and lose valuable labour in the face of difficult conditions.

The theoretical costs calculated here are considered to be competitive with similar commercial results achieved elsewhere in Australia on anecdotal evidence, although this remains to be tested. A 1994 paper calculated best practice Australian processing cost at around \$1.15/kg (Industry Commission, 1994).

Australian Meat processing is a difficult industry in which to generate reliable returns. The Western Australian industry suffers well documented disadvantages in relation to east coast industry, and some of these would be amplified in the Rangelands. Long term viability is likely to be achievable only if some 'safety net' provisions were in place to protect the operation against potential poor season brought about by drought or other climatic events, lack of producer loyalty in the face of improved live trade conditions, and fluctuations in foreign exchange.

This raises an array of structural and policy issues for government to consider in taking this assessment to the next stage.

Despite disparate stakeholder views, all available evidence suggests that a new abattoir should be built to slaughter a minimum 400 head per day, for greatest chance of commercial success.

Such a facility could be built in the Northern Rangelands for an estimated \$33.85m excluding land acquisition and provision of services. A minimum of 160 staff would be needed to operate a facility processing 100,000 head per year.

Steady supply of cattle to utilise this capacity is the single most important factor in commercial feasibility of such a facility.

9. FINDINGS

Demonstrated need for a processing sector

- The high level of dependence on the Indonesian live export trade is a major business risk to beef producers in the Northern Rangelands.
- Current indications are that 350kg weight restrictions re-imposed by Indonesian live importers will remain in place for the foreseeable future. There will be an absence of sales options for cattle types excluded – cracker cows, pregnant females, heavy steers, shorthorn stock.
- A long term view of the Rangelands industry would incorporate the need to start planning for a processing option in preparation for future trends of this nature.
- Access to abattoir facilities and to a processing stream would be of significant benefit to the Rangelands beef industry, particularly producers in the most northerly areas. Producers in these areas suffer a significant financial disadvantage in using southern processors, due largely to live cattle freight costs.
- The relatively small size of the herd, and annual turnoff volumes, means that any new abattoir would need to command a large percentage of the live trade's current sales volume. An abattoir would not be able to survive on the live trade's 'discards' alone.

Separate regional approaches required

- The distance between the Kimberley and the Gascoyne regions is great. For the producers in different areas to gain access to a processing stream alternative, different regional strategies will be required. The greatest value in any abattoir option accrues to producers in the immediate region, and diminishes with the distance that needs to be covered by live animal transport.
- A West Kimberley abattoir would be of significant value to the Kimberley and Northern Pilbara regions, essentially adding a processing option not available at present. The likelihood that the Northern Territory will gain some processing capacity in the short to medium term, combined with other advantages means that the West Kimberley would be a better location than the East Kimberley.
- This means that a new facility would need to be developed for the region. Broome is the preferred location due to urban scale, access to road and sea freight advantages. Derby may be preferred as an industrial host, but would face disadvantages in attracting and retaining a supply of labour.
- A Gascoyne or Midwest regional abattoir would improve current returns over those from processing options currently available to Southern Rangelands, and Southern Pilbara producers. The need for this is less pressing than in the north. If an existing processing operation in the area can be extended to handle beef, this would be a better outcome than a new comprehensive abattoir.
- Existing abattoirs in the northern agricultural zone could be engaged in discussion regarding any interest in developing increased cattle slaughter capability. Government, however, should be mindful that this option could reduce the numbers of Rangelands cattle currently being processed in the south, which may affect profitability of some of these operators, and possibly hasten rationalisation of the domestic processing sector.

- Any new regionally significant facility should be built to best-practice standard, providing a comprehensive slaughter and boning service, and capable of processing a minimum 400 head per day. Investment in smaller facilities, or reducing the scope of services provided would reduce capital risk but increase unit costs and reduce the ability to generate genuine commercial returns on capital for the owners.

Agistment sector planning

- As a pre-requisite for any abattoir development, a Rangelands regional plan for the beef industry is required to stimulate the development of a backgrounding or agistment sector, particularly in the north.
- This will involve the development of a feed-on capability in coastal areas, probably based on irrigated pastures, hay production and/or other roughage sources. This would ameliorate the 12 month supply problem previously faced by processors in the dry tropics. This development would provide focus for producers, including indigenous managed properties.
- There is no need for this sector to be developed in a single zone or property adjacent to an abattoir. Individual lease holders should be encouraged to make investments of this nature in strategically suitable areas. Mining leases capitalizing on dewatering options would be a good source of this capability.
- Development of such a sector would be of great benefit to the industry whether or not a processing stream emerges, and should be pursued in any case.
- Preliminary efforts should be in this direction, focusing on identification of suitable areas under artesian water resources planning, easier irrigation and development approvals on pastoral leases, and development of commercial structures for the provision of agistment etc as part of a processing stream.
- This planning process would also incorporate an investigation into the ability of producers to engage in an ownership structure with the abattoir operators to ameliorate seasonal supply risk and compete effectively with live trade prices from time to time.
- DAFWA would be well placed to lead a multi-agency approach to the co-ordinated development of such a plan, in collaboration with the Western Australian Beef Industry Council.

Economic viability

- Despite current levels of commercial interest in small scale investments, a significant abattoir development would require some active assistance from state and regional levels of government, in order to guarantee achievement of high quality product for the longer term.
- In strictly commercial terms, it is unlikely that a new facility will be viable at any location in the subject area, as the returns on capital are unlikely to be high enough to warrant the risks involved (seasonality, competition with live trade, foreign exchange fluctuations etc).
- Under ideal climatic and trade conditions, modelling suggests a new operation could be competitive with existing processors and would be strongly profitable. In most realistic seasons, however, when throughput is variable, profitability is lower, and losses would be incurred in the weaker seasons. This annual variability poses the greatest risk to the consistent positive returns sought by investors.

- For this facility to operate cost-effectively, throughput equating to around 75% of the average Kimberley live trade would be needed. This obviously implies that the live trade would need to become a back-up option for the Kimberley for the processor to be viable. This may only become a practical reality if Indonesian import restrictions were to be combined with domestic policy and regulation seriously restricting the live trade.
- A new comprehensive facility would certainly require some assistance from government sources, particularly to ensure that it is built and managed to optimum standard. Any capital assistance might be sourced from any compensation packages potentially resulting from negotiations over local Kimberley energy developments. Other forms of assistance could be through increasing ease of permits and licences, subsidized indigenous labour schemes, and industry structural adjustment funding (i.e. addressing the 'store trap' issue).
- Most importantly, it would require some form of producer commitment to be integrated into its ownership and management structure.
- To generate real ongoing value for producers from a processing stream, a genuine competitive local market for slaughter cattle would be necessary. This could be achieved, for example, through a system whereby more than one processor operated separate boning rooms in a common facility, under a 'service kill' model. Existing facilities operated by the processor closer to end markets would then finish the products for sale.
- Any new facility should be operated and managed by an operator or operators with strong international market presence, and a proven ability to target growth markets.
- Freight cost differentials between potential new abattoirs and established competitors are encouragingly low, given the availability of road and sea backload freight capacity. Processed meat product can be freighted much more cheaply than live cattle.
- Labour is the greatest cost component, and the seasonal cost risk problems might be ameliorated under the terms of any indigenous labour assistance schemes.
- Unpredictable supply problems would be further ameliorated if the agistment sector can be developed, and producer buy-in to the processing stream can be harnessed under a management model.
- Government assistance would be less significant and necessary for an existing operator seeking to offer a cattle slaughter service. It would be inappropriate for overt assistance to such a processor, where this might have a detrimental effect on the viability of other existing processors. Any assistance granted could be negotiated through normal state and regional development channels.
- The concept of seasonal processing of camels and goats has some merit, but should not distract from the fundamental need to establish fodder and agistment industries to support year round availability of stock for a beef processing facility.
- Mobile abattoirs would not appear to offer significant benefits to the industry in the long term and it is difficult to see how government could sponsor this form of processing in any substantial way. Entrepreneurial activity of this nature, however, could be a useful interim step towards the development of a processing alternative for the region.

10. RECOMMENDATIONS

In view of the growing risks to the viability of the live trade for many producers, the state Government should continue to investigate options for stimulating commercial development of a processing stream for the Rangelands.

As part of a risk-mitigation approach to this issue, the following steps should be taken:

- the future of the live export trade in WA should be formally reviewed in view of emerging market issues and the regulatory environment;
- a location for a possible abattoir in the area between Broome and Roebuck Junction should be researched in detail;
- identify the steps necessary to reduce impediments to the development of irrigation capability in key districts so that an agistment sector can be allowed to develop and flourish;
- existing major regional and national processor companies should be formally approached to consider commercial options for developing and operating such a facility, including the multi-operator 'service kill' and other models;
- estimate the 'commercial gap' between likely development and operating costs, and model financial viability in greater detail;
- determine the nature of any in-principle support that could be offered by the state to provide incentive to invest in processing (e.g. provision of land and headworks, low-interest loans, risk-sharing mechanisms etc)
- engage with producer organisations to determine the commercial structures necessary to give processing a dominant marketing position in the region

The state government should open discussions with existing WA abattoir operators seeking to expand their capability to offer services to the Rangelands beef industry. Types of assistance to be considered could include various forms of risk underwriting and a 'one-stop shop' approach to permits and approvals.

The Department (DAFWA) should initiate a multi-agency approach to the structural reform of the Rangelands beef industry and seek to incorporate a Northern Territory government response to the issues affecting the entire northern cattle production region.

A joint government industry Rangelands Cattle Industry Working Group (potentially established through the WA Beef Council) should address structural reform issues including the active development of agistment and fodder production industries to underpin improved productivity of the industry and any processing capability.

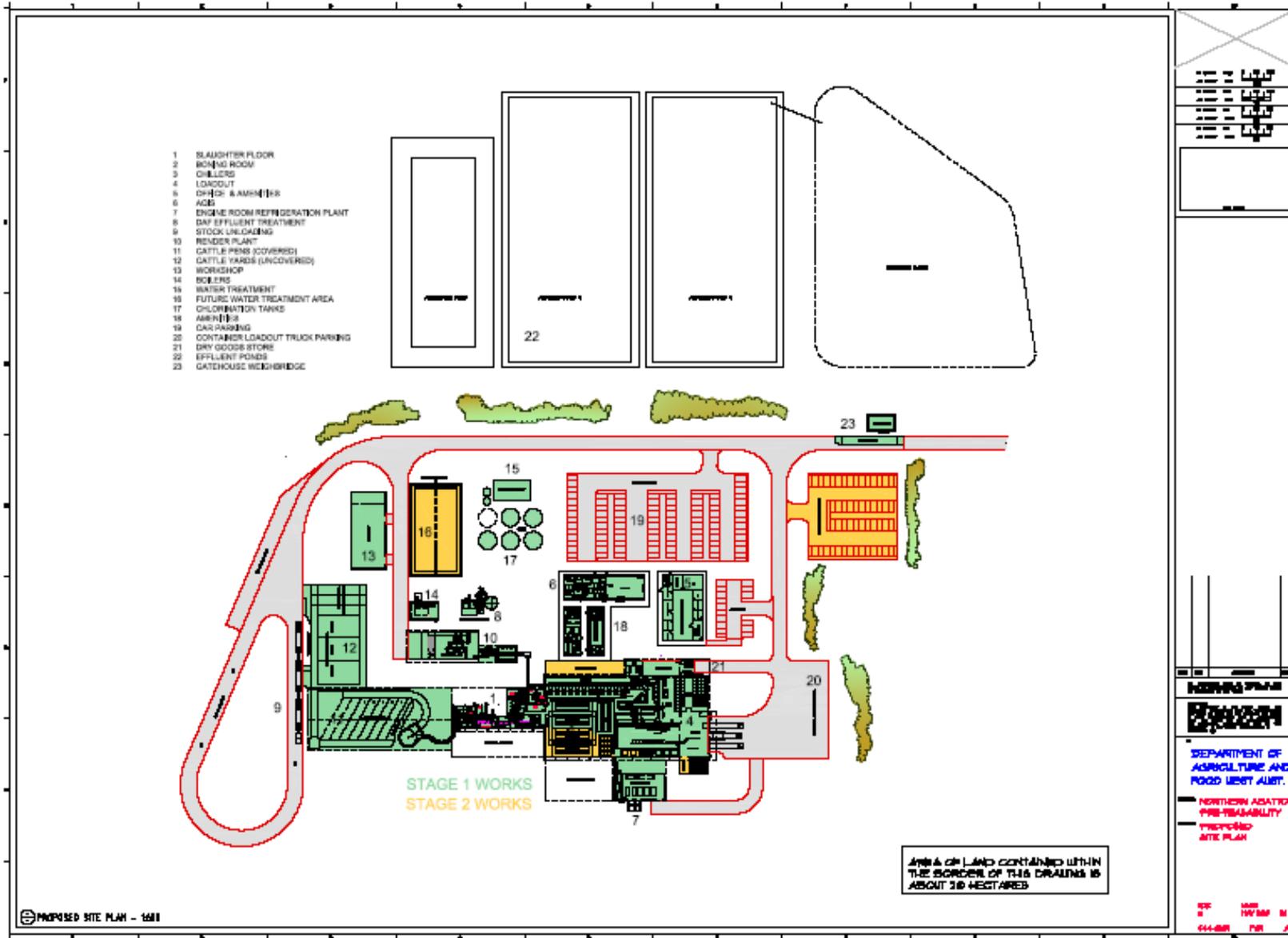
Working Group participants could include:

- State Government (DAFWA, Regional Development, Pastoral Lands Board)
- Commonwealth Government (RIRDC, DAFF, DFAT)
- Northern Territory Government
- Pastoral producers representation
- Indigenous development representation
- Mining industry representation

11. REFERENCES

- Australian Bureau of Agricultural and Resource Economics (ABARE) – Live animal exports, 2008
- Australian Livestock Transporters Association (ALTA) – Smart infrastructure investments and regulatory reform policies to support the rural freight task, 2008
- Burggraaf, W. (DAFWA) – A descriptive analysis of the beef supply chain in Western Australia, 2004
- Burggraaf, W & Manners, A. (DAFWA) – Cattle and sheep processing review, 2005
- Lapworth, J. – The expanding live cattle trade in Northern Australia, 2001
- Meat and Livestock Australia (MLA) – 2020 Vision for the Australian Beef Industry, 2009
- Neithe, G. - A pre-feasibility study of supply and demand issues for a multi-species abattoir in Northern Australia, 2009
- Neithe, G. & Butler, G. – A feasibility study of mobile abattoir opportunities to service the Northern Territory and northern regions of Western Australia, 2010
- Neithe, G. & Quirk, M. – A scoping study on potential beef production from the northern rangelands of Western Australia in relation to the supply chain, 2008
- Northern Territory Government – Pastoral Market Updates, 2010
- O'Loughlin, Ed, (DAFWA) – Issues in the Western Australian Beef Industry, 2008 Pastoral Lands Board of WA – Annual Pastoral land Condition Reports
- RCS Hassall Pty Ltd – Abattoir Pre-feasibility Study, Kimberley WA, 1994
- WA Beef Industry Stocktake Committee – Objective Assessment of the Western Australian Beef Industry Supply Chain, 2009. (Also the WA Government response, 2010)
- WA Dept of Food and Agriculture and Food (DAFWA) - Western Australian Agrifood and Fibre Outlook, 2008

12. APPENDIX 1 – CONSTRUCTION PLANS



13. APPENDIX 2 – NORTHER ABATTOIR CAPACITY STATEMENT

WA Government

Northern Abattoir Capacity Statement (DRAFT)

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1 Introduction

This section of the pre-feasibility study outlines the capacity and operational concepts for a proposed Export Abattoir in northern West Australia to process up to 100,000 cattle per year (400/day). Plant viability requires this daily throughput.

It is expected that the plant would commence at 50,000 cattle per year and would be designed to handle this throughput on a daily 8 hour (7.6 working hours) shift, 5 days per week, 50 weeks per year which is equivalent to 250 working days per year.

Initial Plant Throughput	200 cattle per day
Viable Plant Throughput	400 cattle per day

The design is based on the requirements for an export licence from AQIS to comply with USDA and EU requirements.

The plant layout is designed to also meet Halal requirements.

Any final design will need to be reviewed with AQIS Canberra to ensure EU standards have been appropriately interpreted and then a more detailed design submitted to Council for Building Approval.

The site location and establishment is subject to Western Australian Legislation, including;

Planning and Development Act 2005

Environmental Protection Act 1986

Rights in Water and Irrigation Act 1914

Waterways Conservation Act 1976

Health Act 1911

Fire and Emergency Services Authority of WA Act 1998

Several other factors also need consideration when designing the requirements for this Abattoir, including:

- a. Available land for effective management of plant wastewater
- b. Sufficient property for future expansion of plant
- c. Access to essential services, such as Water, Electricity, Gas, Roads etc.
- d. Design for local climatic conditions and any sensitive environmental concerns
- e. Available labour source and skills set

The reliable supply of animals for slaughter, available markets for processed meat products, transport and supply chain issues, etc. are important for the ongoing viability of the plant and are discussed in other sections of this Report.

There are benefits in the ability of the proposed Abattoir to produce Halal product and pursue Halal certification, providing access to wider local and overseas markets.

2 Key Characteristics

Element	Description
Major Plant Components	Yards, Abattoir Buildings, Render Plant, Wastewater treatment ponds
Plant operating hours (day)	8-12 hours
Plant operating days (year)	250 days
Cattle throughput (day)	400 / day
Cattle throughput (year)	100,000 / year
Avg. Hot Standard Carcass Weight (HSCW)	250 kg
Power peak demand	1.9 MWh
Gas demand	310 GJ per operating day
Water usage (day)	1.1 ML
Water usage (year)	275 ML
Meat Production (meat and offal)	80 tonne per day sold primarily to International Markets
Meat Production (meat and offal)	20,000 tpa

3 Drawings

Two drawings are provide to demonstrate the general arrangement proposed for the plant.

Dwg 444-001-P01 Rev A Proposed Site Layout at 1:600 scale
 Dwg 444-001-P02 Rev A Proposed Layout of (Viable) main processing buildings at 1:200 scale

A third drawing has been included to show the potential areas of capital savings during the initial building and operating phase of the project.

Dwg 444-001-P03 Rev A Proposed Layout of (Initial) main processing building

These layouts show the proposed building arrangement and surrounding plant as well as access roads, cattle yards and water treatment areas.

4 Livestock

The proposed Abattoir will need to process a mix of cattle, depending on the selected location and available supply from the beef herd in the surrounding area.

The types of cattle livestock for processing from northern western Australian herd include:

- Bulls
- Cows
- Steers/Bullocks
- Heifers

The mix of livestock varies dramatically between northern regions of Western Australia.¹

The Hot Standard Carcass Weight (HSCW) or dressed carcass weight of Beef (hung on rail in Chiller) varies significantly with the type of cattle processed, typically ranging from an average 200 kg for Yearling to 380 kg for grain fed Ox or Bulls.

The average carcass weight for Australian Cattle in 1998 was 253 kg²
The average carcass weight for WA processing Sector, 2009 was 249 kg³

An average carcass weight of 250 kg for daily kill of cattle has been used for the purposes of initial design for the proposed northern Abattoir.

Plant design capacity is based on a throughput of 400 cattle per day at average carcass weight of 250kg on a single shift basis. Cattle will be supplied from properties in the region or from a feedlot located close to the property.

These numbers and assumptions need to be adjusted for a balanced production, once the location for a northern Abattoir is selected and the mix of the available herd is known, and an operator for the Abattoir identified.

5 Yards

5.1 Holding Yards and Pens

It is proposed to provide holding yards and holding pens adjacent to the slaughter floor.

Stock will be unloaded from trucks using dual level ramps and drafting race into unloading holding yards.

¹ Ref: Abattoir Pre-feasibility Study by Kimberley Beef Industry Development Team, 1994

² Source: AMLC

³ Source: WA Beef Industry Stocktake Committee Report

Each holding yard would be approximately 4m wide with an area to hold one truck trailer (12.2m top + bottom deck) of cattle. Assuming the mean live weight of cattle is around 500 kg, each holding yard would hold approximately 44 cattle.

The cattle will enter one end of the holding yard and leave through the other end and be directed to either the holding pens or directly enter the lairage for access to the slaughter floor.

The yards and pens will be stabilized earth floor and drained away from the access lanes and into a stormwater effluent run off system.

The open holding pens will be classed as feedlot pens and follow the Code of Practice for the Welfare of Animals and AQIS operational guidelines and laid out to the general parameters defined by Temple Grandin.

Note that the system of raceways from unloading to the lairage will be fenced with steel posts, mid rails and fitted with gates at convenient centres.

5.2 Lairage

The lairage pens will hold approximately 400 head of cattle or daily throughput under cover.

Lairage pens will be designed on a diagonal configuration with each pen and race separately kerbed and drained and having an impervious concrete floor. The post and rails will be galvanized, and/or concrete panel construction, and designed to minimize bruising and stress to the cattle.

The pen infeed and exit feed lanes will be 3m wide. Each pen will be approximately 3.5m wide x 23m long with an area of 82m² in area holding 44 cattle.

The raceway to the slaughter floor will be circular in shape incorporating a cattle wash and the latest techniques in livestock handling.

6 Slaughter Floor

It is proposed that the Abattoir have an Australian Government Supervised Muslim slaughtered (AGSMS) system.

The knocking box inside the building and the sticking / bleeding will be designed and orientated to meet Halal requirements.

The flow of processing through the Slaughter Floor will be from 'dirty' to progressively cleaner area. Standard separation of staff will be provided with different access for 'Hide On' and 'Hide Off' areas. These areas will include all boot and apron wash facilities and have been indicated on the layout drawings.

6.1 Slaughter Floor Dressing

As the proposed throughput is approximately 50 carcasses an hour, the floor layout will be based on a traditional 'On Rail' dressing line using stainless steel hooks with stainless steel skids. Conveyor rails will be high enough to ensure adequate floor clearance.

A downward hide puller is proposed with electrical stimulation equipment to minimise any risk of backbone breakage and provide a clean hide takeoff.

The operator platforms will be designed to allow flexibility of operator numbers to maintain economies of operation over a range of different kill capacities.

6.2 Emergency Slaughter

The design of the slaughter floor sticking area is to allow for cattle that require emergency slaughter.

The carcass is then passed through the slaughter floor area and held in a retain area on the slaughter floor and assessed prior to further non-halal processing.

6.3 Slaughterman Team

The optimum number for a balanced team of operators on the Slaughter Floor per Kill Capacity has been calculated using units of time for job descriptions.

KILL CAPACITY / DAY	200	300	400
Hide-On Labour	9	12	17
Hide-Off Labour	4	6	7

For example, a team of 24 Slaughter Floor operators will be required for a throughput of 400 Cattle per day.

6.4 Slaughter Follow-On Labour

This group of operators include head workers, viscera line workers, foreman and learners and those who also assist with cleaning down operations on completion of the day's work.

KILL CAPACITY / DAY	200	300	400
Hide-On Labour	3	4	5
Hide-Off Labour	8	12	16
Other Labour	2	2	3

6.5 Edible Offals

The edible offal area will be separated from the slaughter floor and provided with air conditioning of not more than +10°C complying with AQIS requirements for handling edible product.

The overseas markets and current price obtained for different edible offal will determine what is processed at the plant, which may include:

- Red Offal - Kidneys, Livers, Hearts, Tongues, Cheeks
- White Offal - Tripe Pieces, Honeycomb, Bibles, Omasum, Intestines, Mountain Chain, Paunch

The assumption has been made that the majority of the listed edible offal would be processed for 100% of kill.

Edible Offal processing rooms will be sufficient in size for processing tables, Tripe washing / refiner equipment etc. and for carton packing /handling.

All offal will be packed and frozen for transport. No allowance has been made for chilled offal production at this stage.

Weighed cartons of offal will be transferred from the offal area via overhead conveyors to the sorting area for lidding, strapping and delivery to the plate freezers.

All offal cartons would be handled in plate freezers.

6.6 Gear Handling

It is proposed to use an automated hook return system. This simple conveyor system would pick up hooks from the boning line and convey them back to the area set aside for gear cleaning located adjacent to the kill floor.

The stainless steel hooks would pass through two cleaning operations to ensure they are fully cleaned. After cleaning the hooks will be loaded into a bin and moved to their point of use on the slaughter floor.

6.7 Associated Slaughter Labour

This group of workers are used for gear cleaning, operating forklifts, blood collection, assistance in the offal area and for offal carton packing.

KILL CAPACITY	200	300	400
Offal & Other	8	13	17
Yards & Render	6	9	12

6.8 Quality Inspection

Critical control points (HACCP) during the slaughter and dressing process will be established to minimize the risk of carcass contamination. Visual inspection of the head, sides and viscera will also be undertaken by Australia Quarantine Inspection Service (AQIS) Inspectors for defects, disease and contamination.

The final inspection of a carcass will be performed on the slaughter floor prior to chilling.

7 Chillers

Four (4) hot carcass chillers, each capable of holding 100 cattle carcasses are incorporated in the initial design. The chillers will be designed to reduce the deep butt temperature of the carcasses, to 15°C in 20 hours.

These chillers will be fed with hot carcasses directed from the slaughter floor passage. Discharge from the Chillers will allow grading / sorting into a holding chiller ready for Boning Room production runs.

The holding /storage chiller will be designed to allow product heat reduction on a similar basis to the 4 chillers with the additional ability to be controlled as a holding chiller, down to a preset carcass temperature of +3°C over 24 hours (or 0°C in 48 hours). The refrigeration capacity of the rooms will be designed to cater for a peak load of an extra 35% to maintain minimal weight loss on the short chill cycle.

Pre trimming and boning preparation will be carried out at discharge from the holding chiller after sorting, and the carcasses weighed immediately prior to entering the boning operation.

At this stage the expected production will not include capacity for chiller or frozen despatch of carcass quarters. A final working design may need an option for load-out of quartered beef to other local facilities or in the event of a disruption to production.

All chillers will be designed with PLC control systems on an individual room control basis to minimise weight loss, control condensation and to minimise hard fat boning problems. The system will incorporate step temperature and air velocity variable controls, considered a practical way of controlling chiller performance.

All chiller rails will be standardized at 3600 mm above floor level. The chiller rooms will be constructed on a slab with sub floor ventilation and appropriate floor insulation.

8 Boning Room

8.1 Boning Team

Production achieved by the Boning Team is dependant on the cattle weight range, cuts per body and working hours.

For the proposed throughput of 400 cattle an operation based on one sided boning on a conveyor is shown. The assumptions of an average carcass weight being 250kg and approximately 30 cuts per body for boning, were the basis for determining the following boning room manning levels:

KILL CAPACITY / DAY	200	300	400
Boners working 8 hr shift	10	15	19
Boners working 10 hr shift	8	12	15

To minimise the number of required boning operators and improve efficiency the design is based on 15 boners working a 10 hour shift.

The length of the boning line is based on 1.6m centres between operators using hydraulic rise/fall platforms.

A boner/slicer ratio of 1 : 1.25 has been used to determine number for slicers in the boning room. This design will provide up to 19 slicers and a balanced working team.

8.2 Carton Capacities

The design of carton packing area and subsequent palletizing and storage areas, has been based on the following assumptions:

1. Boned Product - Worst case 100% Frozen
2. Boned Product - Typical 70% Frozen and 30% Chilled
3. Offal Product – 100% Frozen

Boned out weight is in the order of 68-72% of dressed carcass weight, so using an average of 70% equates to 175 kg of meat to be packaged. Packed carton weights usually range from 25 to 27 kg per carton, so for throughput of 7 cartons per carcass.

Offal Product may range from 20kg – 35kg per head of cattle slaughtered. For the purpose of this report we have assumed 1 carton per animal.

Boned Product 7 x 400 HD = 2,800 Cartons per day (worst case – 100% frozen)

or typically = 1,960 Cartons per day (70% frozen)
 + 830 Cartons per day (30% chilled)

Offal Product 1 x 400 HD = 400 Cartons per day (100% frozen)

8.3 Carton Store and Carton Forming

It is expected that the plant will use two basic carton types for either the offal or boned meat products.

Cartons will be formed on site with automatic carton forming equipment. The one piece frozen product cartons and chill bases will be manufactured to match production demand.

The carton forming area is to be located close to the packing area to allow for carton feed direct to usage points in the packing areas.

A separate dry store area will be provided for wrappings with direct access to the boning room floor for Vacpak bags, liners, wrapping materials, box fillers and other specialized packaging.

To allow adequate back up for cartons in this remote area the carton store is sized to receive 2 x 20 tonne lots. This is a total storage capacity of 60 pallets at approximately 600 cartons per pallet (=36,000 carton flats). The carton store is to be fitted with racking to allow 3 high stacking.

8.4 Quality Assurance

As part of the Meat Safety Quality Assurance (MSQA) Program, Critical Control Points (HACCP) would be implemented in line with criteria set by the Codex Alimentarius Commission of the World Health Organisation. These processors would be monitored by the site QA officers and AQIS.

9 Packing Area

9.1 Vacuum Packaging

The layout provides for 1 x VS95 W.R. Grace vacuum sealing machine which will handle 12 to 18 packs per minute with appropriate manual loading, and shrink or air blast tunnels to tighten packaging. An alternative would be to bag cool immediately after shrinking, using a refrigerated dip tank.

Also an option to include gas flush in the vacuum packing operation should be considered if shelf life is a critical issue.

It is proposed that one third of boned product will be chilled. At 400 bodies per day and a 7.6 hour effective working day there will be a throughput of 52 bodies per hour. With 30 cuts per body the total cuts per hour will be $52 \times 30 = 1560$. For 1/3 to be vacuum packed the vacuum packing rate would be $1560/3 = 520$ packs per hour or 8.7 packs per minute. This rate will be achievable with the VS95 sealing machine.

9.2 Carton Strap and Scale

Cartons from both the packing frozen product at the pack stations and the cartoned chilled product from the VS95 system will come together as a single stream.

It is proposed that an area of roller storage will be a buffer against breakdown or mechanical adjustment of downstream operations.

All cartons will be automatically strapped and passed to an automatic feed carton weigh and label marking system such as SASTEK.

From this point the cartons will be sorted into streams of:-

- Cartons for plate freezing.
- Cartons to be Chilled.
- Reject cartons for returned to the pack area for rework.

9.3 Offal Carton Handling

Offal and tripe cartons will be collected in the carton packing area to be strapped and scaled.

This product will be transferred by pallet to an entry point in the packing area that allows it to be handled through the centralized scale and label point. A separate scale/label system is not justified for the approximately 400 cartons per day of offal expected.

Alternatively, offal cartons are transferred to the carton storage areas by an elevator and transfer conveyor above the carcass chiller area and running next to the service walkway to allow adequate supervision.

9.4 Labelling & Quality Inspection

The carton is to be labelled with information such as the establishment number, product, weight, date, time and barcode. An Australian Inspectors Stamp will finally be applied to signify that all AQIS and overseas country requirements have been met.

10 Freezer and Cold Stores

10.1 Carton Freezing

Seven (7) manual plate freezers each 400 carton capacity per day have been included in the layout for 24 hour +15°C to minus 12°C product temperatures based on a 180mm corrugated cardboard carton.

Total carton capacity is 2800 cartons and allows for typical 70% boned product plus 100% offal product.

The selected units are designed for manual loading and unloading at a fixed height. These units are economical to run and perform satisfactorily in terms of operation and refrigeration performance.

Automation of loading/unloading the plates could be considered at a future date.

10.2 Blast Chilling

Required capacity (30% of boned product) = 840 cartons per day

Two (2) separate cell blast chillers have been included as part of the chill holding and storage area, each sized to store half the daily chilled cartons. Each blast chiller would be sized to store approximately 420 cartons on fixed stillages for air circulation. The chiller would be designed to reduce the temperature of the packs from 16°C to 0°C in 16 hours.

10.3 Chill Store

A chill store capacity of 3,000 cartons will be provided to store over 3 days chilled product.

Cartons from the blast chiller will be stacked with gaps on standard timber type pallets (CHEP or similar) for storage. Each pallet will contain approximately 30 cartons.

The store will be set up with single depth pallet racking for high lift fork access. Racking will permit 4 high pallet stacking at each position in 4 rows providing around 100 pallet capacity.

10.4 Freezer Store

This store will be bulk stacked, in drive-in racks 4 high and 5 deep bays along the wall lines. This area will require provision of trafficable floor for high lift pallet fork trucks.

A freezer store capable of storing up to 180 pallets has been incorporated in the design. At 36 cartons per pallet a total storage capacity of 6480 cartons is possible.

100% Frozen boned product + 100% offal = 3200 cartons per day (89 pallets)
70% Frozen bone product + 100% offal = 2360 cartons per day (66 pallets)

Storage capacity will be 2 days if all product is frozen and around 3 days if 70% of boned product is frozen.

With daily unloading of product, it is planned that this store will normally be utilized at 50% of capacity.

Manual carton operations with forklift pallet movement is proposed

10.5 Carton Sorting Palletising

An area has been allocated for lidding, strapping, manual sort of cartons and palletizing operations. The area will have two delivery conveyors to numerous pallet loading positions along each conveyor.

Cartons will be manually stacked on pallets with slip-sheets for freezer storage. Pal-lift units could be provided at all palletising locations for ergonomic manual handling of cartons.

10.6 Carton & Pallet Handling

The proposed 400 cattle per day kill represent approximately 4 to 6 x 20ft Reefer type containers per day.

Both freezer and chill stores will dispatch via the single product despatch area.

One load-out door for Pantec trailers will be fitted with door seals for product security and the road surface ramped to the load-out for direct forklift across a dock leveller into the trailer.

One door will be provided for access to containers on truck trays. This area is to be an enclosed scissor lift platform with dock seal to the container.

A load-out office is included to house inventory and data recording equipment.

Pallets will be marshalled in the load-out dock and the product on slip-sheets is loaded directly into refrigerated trailers. Pallets will not leave the plant.

11 Rendering

11.1 Mixed Abattoir Material

For a 400 head kill the render plant will be required to handle approximately 190 kg from each head of Cattle or 76 Tonne of Mixed Abattoir Material (MAM) in 1 extended shift of around 12 hours. This is the total raw material waste from the slaughter floor and the boning room.

11.2 Deadstock

Provision has been made in the layout to allow dead stock from transport or feedlot to be brought into the Rendering Plant. This is an acceptable practice but must be noted in Authorities Approvals.

11.3 Render Process

The rendering plant will be located close to the main plant, to allow screw conveyor feed from the slaughter floor and boning room. A prehogger will be provided within the main building to size material at discharge from the storage bin to the Cooker feed. A metal detection system will be installed at this point.

The layout is based on using a single 900 Series continuous cooker at 5,700 kg/hour raw material, 50% moisture content has been selected to allow for the 400 kill and could in fact handle this requirement in a 14 hour charging time or a single 16 hour shift depending on the product mix on a given day.

The render plant will produce the following amount of by-product:

- Bulk Blended Meat Meal - in the range of 17 to 20 tonne per day
- Low grade Tallow - in the range of 16 to 19 tonne per day

Blood drying using a gas fired ring dryer to process 600kg per hour of raw blood (based on 12 litres per body). This will enable the blood to be fully processed over one shift and 112kg/hr of dried blood would then be blended into the Meat Meal.

It is proposed that the render building will be arranged to contain the odour producing equipment in one area and, include 3 odour collection systems.

1. High odour discharge points will be separately collected and fed to the boiler air intake.
2. Non condensable gases from heat recovery will also be fed to the boiler.
3. General ventilation air for this zone of the plant will be capable of collection in the building configuration (to be implemented only if and when required).

Other By-products that may be considered at a later date, include:

- Tallow polishing to produce high quality tallow
- Edible Fat Rendering using a low temperature edible fat recovery plant to separate prime quality fat. (15T / day)

12 Staff Numbers

A detailed schedule of staff required for the total operation is summarised in the table below.

Staffing levels of approximately 200 people for the abattoir operation at 400 cattle per day are anticipated. An additional four (4) AQIS inspectors will also be required for abattoir operations.

KILL (HD) / DAY	400
EQUIV. KILLS / HR	52.2
SLAUGHTER	
Hide-on sub-total	17
Hide-off sub-total	7
Slaughter sub-total	24
SLAUGHTER FOLLOW-ON	
Hide-on sub-total	5
Hide-off sub-total	16
Other sub-total	3
Follow-On sub-total	24
ASSOCIATED SLAUGHTER	
Offal & other	17
Yards & render	12
Associated sub-total	29
SLAUGHTER FLOOR TOTAL	77
BONING	
Boners	15
Slicers	20
Direct labour	31
Loadout etc	14
BONING TOTAL	80
QUALITY CONTROL	
Q/A Sub-Total	7
ENGINEERING	
DIRECT -	8
OTHER -	10
Engineering Sub-Total	18
SITE ADMINISTRATION (5 day)	
PLANT MANAGEMENT	10
SITE MANAGEMENT	2
BUYING	2
MARKETING	2
Admin.Sub-Total	16
QA, ENG, ADMIN TOTAL	41
TOTAL PEOPLE	198
MANDAYS/WEEK	990
KILL/MAN/DAY	2
KILL/MAN/5 DAY WEEK	10
INSPECTORS	4

13 Infrastructure

The cost of infrastructure is not included in the Abattoir budget.

13.1 Water Supply

Water usage for Abattoirs varies typically from 4 to 18 kL/tHSCW, however for medium to large abattoir (>100 tHSCW/day). An initial benchmark for water usage is 10.6 kL/tHSCW.⁴

For 400 Cattle per day, the expected water usage for the Northern Abattoir is approximately 1.1 Megalitre per day to be sourced from the best available supply, either town water or alternatively bore water. Water supply will require treatment including chlorine pre-treatment to comply with AQIS requirements.

An enclosed storage facility of at least 2 days usage will be located adjacent to the abattoir to ensure supply to the plant and also act as fire service storage. The final size of storage to meet fire requirements will need to be considered in the final design. A separate fire hydrant feed line (and pump) will need to be provided.

Water treatment is likely to be required in the form of a sand filter and/or flocculation system plus chlorination plant to AQIS requirements. Automatic chlorination recording equipment would be provided to monitor the chlorination system. Treated water holding tanks of 4 hours supply capacity will be provided (2 x 200 KL concrete tanks). Two storage tanks will allow for some level of redundancy should there be a malfunction of the treatment system.

13.2 Electrical Supply

A 2.4 MW supply from the local authority will be required. A high voltage main feeder, will be required to supply a dual transformer station located adjacent the refrigeration plant. The main load areas are the refrigeration engine room and the render operation.

Peak load factor control equipment will be coordinated with the refrigeration plant control systems and should limit peak demand to 1900 kW, and will also link to the render plant pre-sizing equipment.

13.3 Gas

Natural Gas supply is preferred should if available to the site. Typical installation would be a high pressure line to the site, a metered supply and pressure reducer and a low pressure line to the abattoir boiler installation. Refer Boiler House section.

⁴ Ref: MLA 2005: Industry environmental performance review; MLA 2007: Practice Guidelines for the Red Meat Processing Industry

For an export facility with rendering and high frozen product load, the typical fuel consumption figure is 3,100 MJ per tonne of HSCW. Processing 400 HD/day or 100 tonne of HSCW per day will require approximately 310 GJ of natural gas.

13.4 Sewerage

Amenities sewerage will be collected separately and handled through a septic system, with liquid discharge via the process effluent anaerobic pond.

13.5 Telecommunications

Telephone and data lines are external services required to be connected to the abattoir.

14 Plant Description

14.1 Building Construction

In general terms the Main Process Building construction will be on the basis of a ground level construction with only the slaughter level approximately 1000 mm above the offal areas, with chillers and boning operations at ground level and a cut in on the site to allow truck access to the load-out docks at approximately 1400 mm above road level.

Process area walls will be concrete tilt slab construction approximately 2000 mm high supported by a hot dip galvanised structural steel frame. Above this level insulation panel will carry through to ceiling level. Insulated Roofing using a combined steel cladding and insulated panel will be proposed in the slaughter area. Ceilings in all other areas will be insulated panel.

An impervious applied finish will be provided as a protective wall finish in slaughter and boning areas etc., where an easily cleanable surface is required to the 2000mm level.

All doors will be of insulated construction with a pre-painted metal surface. Chiller doors should be mechanical cam opening, and freezer doors fitted with heaters which allow ease of repair. Cold storage load-out areas would be fitted with rapid opening flexible blind 'doors' to reduce temperature gain.

It is proposed to use stainless steel slot drains set into the concrete floors with maximum floor areas in flat plane wherever practical in lieu of multi slopes. Anti skid floor toppings will be applied in walkway areas to define go/no go areas, and floor toughening in process areas.

Areas of insulation panel subject to damage will be lined with stainless steel dimple plate or similar wall protection from the outset of operations. Armaguard railing or similar protection will be provided in forklift areas.

The Render Plant workshop building will consist of pre engineered package buildings sheeted internally with colorbond material, and roller shutter door access. Independent free standing block-work walls will be constructed inside these structures for amenities, office and storage facilities.

Forklift access will be allowed throughout the plant and access ramps etc. provided at strategic locations for access to process areas.

14.2 Administration Building

The administrative office building structure will comprise of a steel framed pre-fabricated frame mounted on a concrete floor slab, load bearing brick walls, timber roof trusses, colorbond steel roof and suspended acoustic ceiling and fitted with air conditioning.

Separate offices will be provided for key managers with the rest of the area as an open plan office.

General office fit-out is not specifically included in the budget.

14.3 Roadworks

Roads from the main gate to the abattoir site receival and dispatch areas will be a 6.4m wide all weather dust free access road. Other less heavily used access and the staff car park will be gravel surface to stabilise the soil surface and limit dust generation potential.

14.4 Car Parking

A car park is provided for approximately 150 cars. The car parking spaces provided are based on 1.36 persons per car for 200 total personnel.

This will service the proposed staff requirements of the abattoir. Additional spaces will be made available as required.

This area will be stabilized gravel with spray chip surface with swale drain removal of stormwater and appropriate landscape planting etc.

The car park access will be directly from the plant main entrance and staff will walk to the amenities via a nominated route.

14.5 Fuel Storage

1. Bottled gas storage (if required) will be located near the boiler and the storage vessel(s) installation completed in accordance with the suppliers recommended standards.

2. Petrol, diesel, storage could be required depending on location of the abattoir and proximity to local supplies. No provision is currently being made for liquid fuel storage.

14.6 Boiler House

A 6 Megawatt (MW) Gas fired unattended boiler is required and this has been sized to comfortably cater for the anticipated steam load.

Natural Gas is preferred, however Bottled Gas is an option or using other waste material such as rice hull firing with an option of coal as a standby could be considered depending on local sources availability and continuity of supply.

Note that coal firing is a worst case for environmental approval.

The alternatives will be considered at a detail design stage.

14.7 Engine Room – Refrigeration Plant

A two stage Ammonia compressor plant, designed for fully automatic operation has been included. The high side (minus 7°C) system caters for the largest load of air conditioning chilling a chill store whilst the low stage (minus 33°C) services the plate freezers and freezer store.

It is proposed that the control system be set up for remote operation and integration by modem and microprocessor to allow a plant engineer to monitor operating conditions of the plant and start up/shut down.

Boning room air conditioning will preferably use the 'sock' type method for uniform (no draft) distribution or cold air with minimal noise.

14.8 Laboratory Facilities

The minimal AQIS laboratory is included in the AQIS Office area and is a separate room. The existing proposal is for minimal testing and analysis equipment for meat meal, fat testing, etc.

A minor laboratory facility is to be included in the boning room to allow chemical lean, testing etc, adjacent to packing operations.

The EPA approval requires assessment of all environmental management criteria and monitoring programs. The programs ensure that all reasonable and practicable steps have been taken to minimise the impacts on the environment.

The monitoring tests are likely to be undertaken as a subcontracted service on a fixed specification and reporting function by independent specialist provider(s) for submission to authorities. Reporting requirements will vary depending on the sensitivity of the site but typically includes:-

- Sampling and testing soil conditions
- Sub soil liquid analysis for potential pollution
- Irrigation effluent analysis

14.9 Workshop

An area adjacent to the By Products processing area is to be provided for a workshop and heavy stores area.

This will require some external storage space and the facility to mechanically service truck engines on site.

This area will include minimal office facilities for the engineering staff. Boiler and refrigeration equipment will be effectively unattended operation equipment with overview control by the plant engineer.

Workshop tools will be considered as operating equipment and not included in the budget.

A separate fitters maintenance rooms are shown immediately adjacent to the process areas for slaughter and boning operations.

14.10 Cleaning

High pressure pumped wash systems will be installed in key areas for zone cleaning.

Ancillary cleaning/foaming systems will be incorporated in this equipment.

14.11 Security

All staff arriving at the works will leave their cars in the car park area and walk through to the amenities buildings for changing into factory clothing.

15 Site Services

15.1 Hot Water

Hot water (82⁰C) will be provided from a waste heat recovery unit attached to the exhaust vapours of the continuous rendering cooker. It will be stored in a stainless steel tank and then reticulated around the plant.

Provision is required for a steam / water plate heat exchanger to boost temperature and recycle heating when render recovery is not available.

Hand basin water (42⁰C) will be made by mixing the hot water with cold in strategic locations around the plant to service specific process areas.

15.2 Compressed Air

A central compressed air plant will be located in the engine room with surge air receivers located strategically around the plant to service specific areas such as the slaughter floor.

Air compressors will be two identical compressor units approximately 100 CFM each to allow adequate standby and peak requirements.

Refrigerated dryer will be required for air supply to instruments, switches etc.

15.3 Ventilation

The slaughter floor will be heated using a steam coil and cooled using evaporative coolers. Ventilation flow will be with strategically located exhaust fans.

Air curtains will be provided at critical personnel and forklift doorways only.

Boning and offal packing areas will be sock air conditioned to 8°C.

Other areas will be mechanically ventilated to meet working condition requirements.

15.4 Plant Communications

Telephones, intercom, radio link, computer equipment, etc will be considered as part of office equipment and not included in the budget.

15.5 Production Data Capture

Production control will require some basic data capture and information systems to be established. Information systems based on SASTEK equipment which offers a known technology for each of these areas is recommended.

16 Waste Management

16.1 Trade Waste Effluent

Process water from the abattoir will be directed to a separate pre screening and cavitation pump based or dissolved air flotation (DAF) effluent pre treatment plant. The waste process water then is biologically treated in anaerobic and aerobic ponds before disposal to land through a spray irrigation system.

A truck wash area will be included in the effluent treatment area so that the waste water is included in the effluent treatment stream.

The effluent treatment process will be subject to EPA Works Approval submission and ongoing monitoring of nutrient levels.

The anticipated elements in the system will be as follows with higher levels of treatment being added should the monitoring indicate that it is necessary.

1. Abattoir liquid waste. Screen to 0.5mm for solids removal.
2. Fat removal in a flotation cell.
3. Anaerobic pond(s).
CSIRO suggest that anaerobic ponds should be designed to achieve HRT of 10-12 days, with an argument for up to 20 days to cope with sludge build up, short circuiting and shock loads; and a BOD load of 200-300 kg/day/ML of pond volume. Western Australian Department of Water² discuss 7-10 days, and a loading of 250-300 kg/day/ml. A lot of these issues are site specific and depend on actual operating conditions and ambient temperatures.

Capacity of 14 days retention, 10 days usage, at 1 ML per day = 10 ML. We have shown a single pond on the property with room for a second pond when the first has the sludge removed and dried out for cleaning.

4. Aerobic pond(s).
CSIRO recommend HRT of 15-20 days for aerobic ponds, and Western Australian Department of Water discuss 30 days. The latitude of the final Abattoir location will influence this retention time. Using a capacity of 21 days retention, 15 days production at 1 ML per day = 15 ML retained volume for both ponds would allow for maintenance work without severely impairing performance.
5. A holding or surge dam prior to irrigation may need to be provided depending on the seasonal variation in evaporation rates. Size yet to be determined based on soil capacity, rainfall, evaporation, and crop selection.
6. The discharge from the aerobic pond or storage dam will be directed to the irrigation system in the cropping area.

16.2 Manure Disposal

Yards manure will be collected from the pens drainage system and passed over a wedgewire screen for dewatering. (Contrashear, Bauer or Aquaguard 0.5mm screen).

Cattle truck wash facilities for abattoir cattle off load will also drain to this area.

Paunch content will leave the building by underground drain directly to a collection pit and be pumped over the same wedge-wire screen noted above.

These facilities will be located in the same area as the effluent pre treatment plant adjacent to the cattle yards.

Road access is provided for trailer removal of manure to be stockpile composted elsewhere on a nearby site.

17 Amenities

Amenities are to be provided for the abattoir staff for change areas, shower and toilets, and canteen facilities.

17.1 Change Areas

Separate change areas for male and female staff including locker space are to be provided. The facilities have been shown on an anticipated ratio of male to female staff of 60/40.

Shower and toilet facilities have been included in the same building, in accordance with the Building Code of Australia for such items as the number of toilet pans, urinal and washbasin facilities etc. Showers are provided on the basis of anticipated production requirements with higher usage likely by mostly male slaughter personnel.

17.2 Staff Access

In accordance with EEC requirements separate staff access will be provided for, hide on, hide off slaughter workers, boning staff and carton handling workers. Facilities in the access area will include boot-wash and hand-wash, and separate areas for equipment racks etc.

Knife sharpening would be located in two separate areas for slaughter and boning respectively.

17.3 Eating Areas

A canteen facility will be provided, sized to allow seating of approximately 80 people eating on a roster basis.

The kitchen is to be able to serve two hot meals per day (breakfast and midday meal) and provide a kiosk service to the exterior wall.

Process operations will be staggered as they operate on a run out basis for slaughter and boning at meal breaks.

17.4 Laundry & Clothing Store

The laundry will be fitted out with commercial wash and dryer equipment and sized to handle 5 pieces of laundry per person.

The Company will provide work boots, plus all the necessary clothing, typically apron, jacket, singlet, trousers and towel for each employee.

17.5 Dry Goods Store

Storeman / Purchasing Officer will be located in a light/dry goods store adjacent to the amenities facility. This is to have vehicle access and back onto the amenities block to supply materials, clothing, cleaning materials etc.

17.6 Hazchem Storage

A separate secure area for storage of all cleaning, disinfectant and other hazardous materials will be provided.

17.7 AQIS

Allowance has been made for separate offices for the Veterinarian and Chief Inspector. A common office area is to be provided for three other inspectors. An AQIS laboratory is to be provided. Separate shower and toilet for the veterinary officer. AQIS dedicated toilet, shower, change room, lunch room of AQIS officers, with separate male and female facilities.

17.8 First Aid

A first aid office, ante room and separate treatment areas have been indicated with access to a separate toilet.

18 Budget

Below is a summary of the preliminary budget costs for construction of a Northern Abattoir for a throughput of 400 cattle per day.

18.1 Exclusions:

1. Purchase of suitable Rural Property (approx 20 hectares)
2. Documentation and Statutory Permits & Licenses
3. Local Infrastructure:
 - Electrical Supply Transformers / Metering / Main Distribution Board
 - Sealed access roads to the property
 - Natural Gas Supply Line
 - Mains Water Supply to Abattoir
 - Telecommunication Services
4. Administration Office & Amenities Equipment
5. General Landscaping
6. Software & Training

Description	Cost (\$)
Infrastructure <ul style="list-style-type: none"> - Mains Electrical Supply - Mains Water Supply - Water Storage and Treatment Facility - Natural Gas Supply Line - Sewerage from Amenities 	Excluded
Site Works and Building Preliminaries <ul style="list-style-type: none"> - Earthworks & Effluent Ponds - Fencing - Temporary Facilities - Soil Testing & Surveys - Roadwork and car park 	2,800,000
Buildings Works <ul style="list-style-type: none"> - Yards, Holding Pens and Lairage - Main Process Plant, Chillers, Freezers, Loadout - Boiler House, Engine Room - Render Building - Administration & Amenities - Workshop 	9,650,000
Process Equipment <ul style="list-style-type: none"> - Main Process Equipment - Rendering Equipment - Hot Water Boiler, Heat Exchangers - Plate Freezers 	12,700,000
Services <ul style="list-style-type: none"> - Refrigeration system - Ventilation equipment - Effluent Treatment & Manure Handling - Piped Services - Fire Services - Electrical Distribution and Control 	6,300,000
Sub Total	31,450,000
Design and Project Management	2,400,000
Total Cost of Abattoir	33,850,000



MEATENG

PRE FEASIBILITY STUDY INTO
A NORTHERN WESTERN
AUSTRALIAN BEEF ABATTOIR
– STAGE 2 OCTOBER 2011

MEATENG

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1 EXECUTIVE SUMMARY

Stage 2 study aims

- Develop the platform for a strategy within which structural changes for the northern Rangelands industry can be advanced in anticipation of further 'shocks' to the live export trade
- Research the views of major Australian processors as to the best commercial means of developing processing options for the northern herd
- Analyse the practical feasibility of a Broome location for an abattoir

Findings

Need for a strategic plan for northern pastoral industry

The 2011 ban on live export is unlikely to signal the end of the trade. Live exports will continue but previous growth forecasts will not be met and volatility will increase.

The Kimberley region in particular will suffer from any reduction in demand from Indonesia and other sources. The development of greater sophistication in the northern pastoral industry is of paramount importance.

Before an abattoir is designed, co-ordinated attention should be paid to the development of a feed-on sector via a range of policy activities which are already underway, but not totally co-ordinated. These include land tenure reform, identification and tapping of new groundwater resources, increased use of irrigation for fodder production and grazing, and support for indigenous industrial employment and planning for energy developments.

A formal plan for the integration of these activities as they relate to improvements in Northern WA beef cattle production and marketing should be sponsored by government and industry bodies. Such a plan would identify the stage in industry development when the introduction of a local Kimberley processor would be of most benefit.

Development of an irrigation industry to support fodder production as well as more intensive grazing in locations where groundwater resources are sustainable is an important precursor to any public sector support for a Kimberley abattoir. A significant irrigated feed-on sector would lead to improvements in herd genetics and a gradual orientation to breeds with greater feed conversion rates and compatibility with beef market tastes.

A feed-on sector of this nature, in line with the 'mosaic agriculture' approach, would open up a variety of supply chain options for Kimberley producers including north-south and west-east processing options as well as local processing.

Impact of a Darwin abattoir

A new abattoir in Northern Territory, if developed, will drive a wedge into the dominance of the live export trade and will be of some benefit to Eastern Kimberley producers. The Western Kimberley and Northern Pilbara, however, will remain significantly distant from a processing option. A Darwin abattoir would capture some share of Kimberley production and would compete effectively with any West Kimberley abattoir due to supply chain to market advantages.

The development of the proposed AACo facility near Darwin would have a significant impact on the potential viability of a Broome abattoir, by providing producers with access to an improving

gateway to Asia via Darwin. Broome would be disadvantaged in relation to both this facility and existing southern WA processors.

It would be prudent to delay any significant action in relation to a Kimberley facility until the AACo development decision is made.

If the AACo facility proceeds, a niche operation in the Western Kimberley is more likely to succeed than a significant standard integrated model of abattoir, due to internal company synergies.

Development of a Broome abattoir

If it is determined that Broome should have an abattoir, a location to the east of the new Broome Rd Industrial Park, potentially affiliated with the ILC pastoral industry training property at Roebuck Plains would appear to be the best location at present.

Commercial forces alone are very unlikely to bring about the development of a new processor in the region – some form of government assistance will be necessary. This assistance would probably take the form of provision of some infrastructure, services etc, and potentially some contribution to the cost of financing construction.

Notwithstanding this, there has been significant interest from some processors in exploring the means of making an investment commercially viable. There are several management models that could be explored in discussions between processors and government agencies, including freehold of land and plant, leasing of same from local authority, as well as different financing models.

If discussions with interested companies do not lead to satisfactory commercial outcomes, the government could investigate other potential governance/management options. Of these, a system under which a co-operative of local producers managed the actual business on behalf of competing marketers might prove the best suited to the local industry circumstances.

The government would benefit from some initial bilateral scoping discussions with interested industry players on a confidential basis in order to develop a good sense of commercial drivers. These could include processor companies as well as pastoral industry representatives that may be interested in operating a co-operative under a zero-capital model.

Depending on the extent to which a role for public funding is deemed necessary following these discussions, it may be useful to initiate an open Expression of Interest (EOI) process for the development of an abattoir at a nominated site.

Report Summary

A. Industry status

Global demand

- Projections for growth in global demand for Australian meat are generally subdued. Competition with the US producers for established Asian market share is strong. The value of Australian beef and veal exports has been forecast to remain steady over the medium term. Prior to the live export crisis, the live trade was considered the most likely sector to achieve growth.
- The outlook for Australian beef in the current environment (possibility of global recession, reduced economic growth in the developing world, falling consumption in

the developed world, volatile terms of trade) is trending towards a low or negative growth scenario.

- Domestic beef and veal consumption remains static

Live export status

- The ban on live cattle exports in June has had a serious impact on the viability of producers and businesses associated with the trade.
- The return to exporting to Indonesia recommenced in August, and almost 90,000 head had been shipped by mid-September. The forecast for the 2011/12 financial year, however, is only 450,000 head, down from a peak figure of almost double that in 2009/10.
- Western Australian export numbers have not recovered as quickly as those in NT and Qld due to the greater numbers of cattle in those states in a state of readiness and higher levels of industry cohesion.

B. WA policy development platform

Pastoral lease reform

- Dept of Regional Development and Lands is leading a 3 year program to reform certain aspects of the pastoral lease administration.
- Aims – to increase development of economically diverse rangelands communities, develop a contemporary vision and improve environmental management
- A new type of tenure, Rangelands Lease, will be developed to improve capacity for leaseholders to undertake new forms of economic activity.
- A less conservative approach is being taken to issuing of diversification permits under existing Pastoral Leases.
- Stage 1 of the program involves drafting legislation creating Rangelands Lease during late 2011. Full implementation will then commence from about 2013
- Proposed impacts of tenure reform:
 - Improved ability for producers to invest in activities ancillary to core pastoral activity (such as fodder production, centre pivots)
 - Capacity for non-pastoral activities such as tourism and resource extraction to be initiated.
 - Development of one-stop shop options for approvals required to gain Diversification Permits.
- A small-scale abattoir development in the West Kimberley has already been approved under a Diversification Permit.

Water allocation plans

- Water usage is critical to many potential activities in the Kimberley and Pilbara, including fodder production and intensive grazing.

- The Dept of Water has new regional water plans for each region, and is developing Water Allocation Plans for smaller areas within the regions.
- Use of ground water rather than surface water in some areas offers great potential for irrigation. The Lagrange water resource south of Broome offers 50 Gigalitres of water per year, of which only 12% is allocated to date (mostly for horticulture).
- An Allocation Plan for the Fitzroy River area is also likely to identify large areas of potential usefulness.
- Large scale development of an irrigation sector will allow pastoral lease holders to invest in a local feed-on sector which will improve capacity to fatten animals across all season types and progressively move them towards markets.
- These activities will also provide opportunity to regenerate native vegetation through focusing grazing on smaller areas. They will thereby increase the carrying capacity of the Rangelands generally.

Mine dewatering projects

- New iron ore projects in the Pilbara will require huge investments in dewatering, since much of the resource is below the water table. This creates an opportunity to develop irrigation projects.
- Rio Tinto's announcement (Feb 2011) of a major extension to its Marandoo mine east of Newman includes a commitment to a water management plan including a trial irrigation project (30,000 ha). DAFWA is working with the company to support the project, which could provide sufficient hay (Rhodes Grass or similar) to fatten up to 10,000 head of cattle over 100 days.
- This type of surplus water usage, if successful, could provide benefits to the pastoral industry, the environment and the mining sector, although there are technical (water quality) and infrastructure barriers to be overcome.
- The ability to produce large quantities of fodder in these areas will be vital to the reduction of input costs for local producers, and could offer considerable environmental and conservation benefits

Supply chain integration

- There is little evidence of genuine supply chain integration for the Rangelands beef industry, largely due to the prevalence of the live trade. There is some history of attempts to integrate various components but there is no parallel with the well-developed east coast chains.
- Integration would provide capacity for producers to extract value from the various activities involved in 'paddock-to-plate' management systems.
- A classic Queensland integrated chain involves centralised control of breeding, backgrounding, lot feeding, processing and marketing activities. Western Australian processors have made some attempts to develop their own property portfolios, but without success.
- Development of an irrigation sector, or series of sectors, would stimulate entrepreneurial activity as producers and leaseholders see opportunities to value add

and improve product quality. This in turn, could lead to opportunities for vertical integration activities along the chain

C. Australian Processing sector

Environment scan

- There has been considerable consolidation within the Australian processing sector in the last 3 years, particularly involving the largest processors. In 2007, the company with the greatest market share was JBS Swift at 16%, followed by Teys Bros at 12%. Following a series of acquisitions, these two companies now control 42% of total Australian production.
- Some of these changes have involved horizontal integration (i.e. acquisition of additional processing facilities) but many have been aimed at synergistic vertical integration through the supply chain. For instance, the Teys Bros joint venture with Cargill Beef Australia brings substantial east coast processing capacity together with grain marketing, feedlots and international supply chains
- The proposed investment in a Northern Territory processor by Australian Agricultural Company (AACo) is another integration example, where the processor would complement the breeding and fattening properties and stock owned by the company.
- Some of these larger companies are now in a position to take a global view of expansion opportunities and look at Northern Australia as a gateway to Asia of increasing significance.
- Livestock producer organisations in WA, NT and Qld are all beginning to explore with government and processors the potential for northern developments as alternative to live export and southern supply chains, identifying growing freight costs and lack of supply chain power as problem areas.

Consultation with processing sector

- For this project, ten processors from WA and eastern Australia were approached for interviews.

Summary of processor views

- The disadvantages of the Northern WA pastoral industry are well known:
 - Lack of steady rainfall, long wet season
 - Bloodlines oriented towards live Indonesian market
 - Isolation from processed meat markets
 - Lack of annual turn-off to support processing
 - Expensive labour and energy costs
- Many processors do not have the scale to raise capital needed for high-risk green-fields investments. Some of the larger businesses, however, are now better able to access development capital than in the recent past, and would be interested to be involved with government support.
- There is a clear expectation that a large share of supporting infrastructure required for a processor development would need to be supplied through public funding.

Operational models

- There is no clear consensus on the scope of operation best suited to the Kimberley task. This would be determined by the national market assessment of the processor company involved, and its own market supply chain needs.

Activity	Capital cost	Staff	Positives	Negatives
Slaughter, chilling and boning	\$34m	200	Conventional operation able to serve most markets	Highest cost
Slaughter, chill and quarter	\$29m	120	Reduces initial capital and labour, boning capability can be added later	Dependent on links with Perth boning rooms
Slaughter and hot-boning	\$33m	185	No carcass chiller costs	No ability to generate value from better quality cattle

Governance/management models

Several management models have been considered, in view of the unique challenges for a West Kimberley abattoir

Approach	Positives	Negatives
Fully private standard model	Clear commercial incentives on operator	Difficult to guarantee returns to the state on any public capital assistance; may not be sufficient throughput to warrant staffing
Public-private partnership	Shared capital risk, improved commercial return for processor	Low economic return to government, services provided at discretion of company
Co-operative model	Achieves engagement and commitment of producer base; some tax benefits	Difficult to raise capital, can be hard for management to escape shareholder control
Publicly constructed and owned facility, leased to operator	Overcomes investment hurdles	May not provide any price benefits versus live export
As above, but with competing leased boning rooms	Provides more competitive options for producers	Higher capital cost, staff mobility issues
Public facility, leased and operated by local producer co-operative on behalf of competing buyers	Provides more competitive options for growers; leaves marketing to professionals	Local co-operative responsible for managing throughput and staff, but no capital costs or marketing expertise required

D. Broome location issues

- Broome remains the most appropriate location for a northern abattoir development in terms of:
 - Local labour sources and accommodation
 - freight hub and port
 - greatest economic need and distance from processing stream

- The AACo proposed development near Darwin, if it proceeds, would be of benefit to producers in the East Kimberley to the extent that it caters for unaffiliated pastoral production.
- The Western Kimberley and northern Pilbara regions remain the most exposed in the event of a decline in the live trade options for WA pastoralists.
- The new Broome Rd Industrial estate will be suited to heavy industry but will prefer dry industries due to drainage issues. Buffer zones required for abattoirs will also present problems
- A further 25km to the east is the Roebuck Plains Station, already established as an indigenous training facility and live export depot. This is a more suitable potential site given its existing infrastructure and status as an indigenous employment facility.

2 INTRODUCTION

This report constitutes the second stage of a project originally commissioned by the WA Department of Food and Agriculture (DAFWA) and the Rural Industries Research and Development Corporation (RIRDC) in 2010, to examine the conceptual feasibility of the development of an abattoir to support the pastoral industry in the Northern Rangelands.

Stage One consisted of a general examination of the structure of the northern WA beef cattle industry and the costs and benefits of a processing facility if one was to be developed.

Stage Two was originally conceived as a more detailed exercise in design and location of a processing facility. Following the completion of Stage One, however, it was redesigned to be a more detailed examination of the commercial views of the processing sector towards such a development, and the type of policy response that the WA government could develop in response to the general issue of the viability of the northern WA pastoral industry.

The production of this report was interrupted by the emergence of the crisis in the Indonesian live export trade in June 2011, the effects of which continue to be felt throughout the industry and northern Australia generally. The preparation of this report has been influenced by these recent events, but remains focused on the policy and commercial issues specific to the state of WA and the Kimberley region in particular.

2.1 STAGE 1 FINDINGS

In brief, the Stage 1 report found as follows:

- The high level of dependence on Indonesian live trade has created a high risk market environment for Rangelands producers
- The Kimberley region is particularly exposed to risk due to its isolation and the relative importance of the beef cattle industry to the regional economy
- Access to a processing stream would be of significant value to Kimberley producers, but a local abattoir would not be commercially viable while the live trade continues to exist
- If a local abattoir was to be developed, Broome would be the most appropriate location (for labour and supply chain cost reasons)
- Prior to any abattoir development, a feed-on or agistment sector should be developed to ameliorate seasonal supply issues and stimulate value-adding activities in the industry

2.2 STAGE 2 STUDY AIMS AND TERMS OF REFERENCE

In summary, the aims of this stage of the project are as follows:

- Develop the basis for a strategy within which structural changes for the northern Rangelands industry can be advanced in anticipation of further 'shocks' to the live export trade
- Research the views of major Australian processors as to the best commercial means of developing processing options for the northern herd
- Analyse the practical implementation of a Broome location for an abattoir

The more detailed terms of reference agreed for the study are as follows:

- 1** In view of risks to beef producers in northern Western Australia, identify the potential outcomes for change in the established live trade, and estimate the impacts of these on producers.
- 2** Facilitate the development of a joint agency policy response to the structural reforms needed in the Rangelands industry. Propose a range of practicable actions that could be undertaken by governments to support the development of alternative production and marketing streams in the event of worst case risk outcomes.
- 3** Formally engage major regional and national processors to consider and estimate the 'commercial gap' between probable performance of a Kimberley abattoir and the required performance for viability. As part of this exercise, further refine capital and operating cost estimates produced in Stage 1.
- 4** Consider a range of alternative commercial models (including Public-Private Partnerships) for abattoir development and operation including 'service kill' models and the operation of competitive boning rooms in a single facility.
- 5** Determine the commercial conditions and the nature and scale of industry changes necessary to gain the involvement of commercial parties in the development and operation of a processing facility.
- 6** Identify the likely competitive impacts of such a development on entrepreneurial processing developments already under discussion.
- 7** Engage Northern Territory government in strategic discussion over the most cost-effective means to facilitate processing options that would benefit a majority of Northern Australian producers.
- 8** Engage local authorities to explore the practicalities of developing a processing facility at an agreed appropriate location near Broome, or another preferred location as required.

3 INDUSTRY STATUS

3.1 GLOBAL TRADE CONDITIONS

The Australian beef industry has been through a difficult decade characterised by static demand, climatic events and political difficulty. The impact of the Global Financial Crisis (GFC) in 2008 on global demand and the high Australian dollar in recent times have also reduced farm financial performance levels considerably.

The most important impacts on the Australian industry in recent times have been the long droughts that affected most regions through the last decade. In response to these events, turnoff tended to increase as pasture quality dwindled, and breeding numbers fell. Since the improved conditions arrived in most regions in 2009/10, restocking has commenced, though annual slaughterings have continued to fall, from about 9 million head (in 2006) to a forecast 8 million in 2011/12 as herds are rebuilt (ABARES Agricultural Commodities, Sept 2011).

Through this period, live export volumes from Northern Australia have continued to increase from a low of 520,000 head in 2005, to 860,000 head in 2009/10.

The outcome of these trends is a forecast reduction in on-farm prices in the short term, due to rising supply and static or falling demand

Projections for growth in global demand for Australian meat are generally subdued. Competition with the US producers for established Asian market share in Japan and Korea is strong. Exports to the United States have fallen substantially this year, in line with the rise of the Australian dollar and weak economic conditions in the US.

Korean beef imports have risen remarkably since a low of 130,000 tonnes in 2004/05, to 280,000 tonnes in 2010/11, just short of the peak figure of 295,000 tonnes in 2002/03. However, much of this growth is attributable to disease problems in the domestic herd, rather than steadily increasing consumer demand.

The weak economic conditions expected to prevail worldwide over the next few years will tend to ensure that consumption of Australian beef stays in zero-low growth territory, excluding the impacts of the usual climatic events in Australia and one-off issues affecting domestic production in countries to which Australia exports. Prices paid in Australian saleyards remain generally static over the last five years and are 20% below the peaks in 2001/02 and 2004/05. There is no perception of growth in the market for Australian or Western Australian product in the short to mid-term future, although in the longer term, demand for protein in general will increase relative to global supply. Trading conditions for the Australian beef industry remain difficult, as they are for most agricultural export commodities.

3.2 LIVE TRADE

The live export trade has experienced a major downturn in mid-2011 due to strong community concerns over conditions in Indonesian slaughter-houses, as well as those in other nations to which Australia exports live cattle and sheep. The industry has not yet recovered its Indonesian market share, and the live export volumes are expected to fall from about 880,000 in 2009/10 to 450,000 head in 2011/12.

Western Australian export numbers have reportedly not recovered as quickly as those in NT and Qld due to the greater numbers of cattle in those states in a state of readiness and higher levels of industry cohesion.

Indonesia has indicated a desire to replace Australian live imports through other sources, and through increased use of boxed beef. However, it will not find it easy to close off Australian supply due to Australia's huge freight cost advantage over alternative suppliers such as Brazil, and the lack of available stock in other Asian regions. Indonesia will also have difficulty meeting its target of self-sufficiency, since its producers have a tendency to sell steers and heifers for processing when prices are attractive, thus weakening their ability to increase their herds (Rabobank Industry Note, Sept 2001)

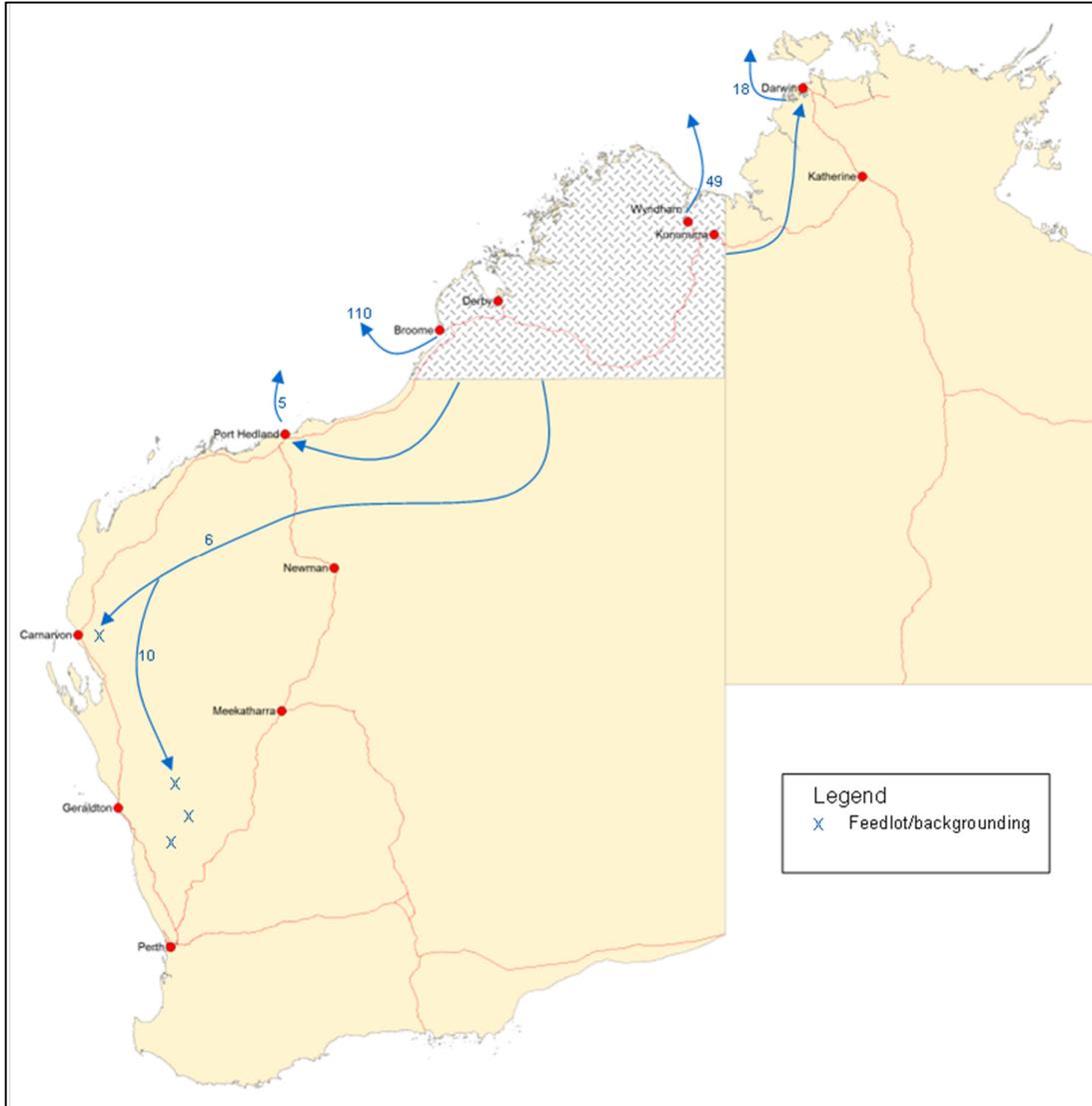
Both the Indonesian and Northern Australian beef industries will need time to adapt to a new environment in which each country will try to reduce its dependence on the live export trade between them.

3.2.1 CURRENT ANNUAL TURNOFF AND CATTLE DESTINATIONS

The maps 1 and 2 illustrate current typical annual cattle movement numbers for the Kimberley and Pilbara region, based on 2008 WAMIA catchment surveys. Map 1 illustrates how dominant the live trade is for Kimberley producers, with very few cattle passing through southern supply chains, either for live export or processing.

This data is now three years old, but is the most recent comprehensive survey data available. At that stage, Broome was the dominant point of export, catering essentially for Western Kimberley production. Less than half of the Broome volume was catered for at Wyndham, and smaller percentages from Darwin and Port Hedland (12% together), reflecting the ability of producers to transport their animals large distances in order to make a sale at the right time and price

Map 1 - Cattle Movements from the Kimberley 2008 ('000 head)



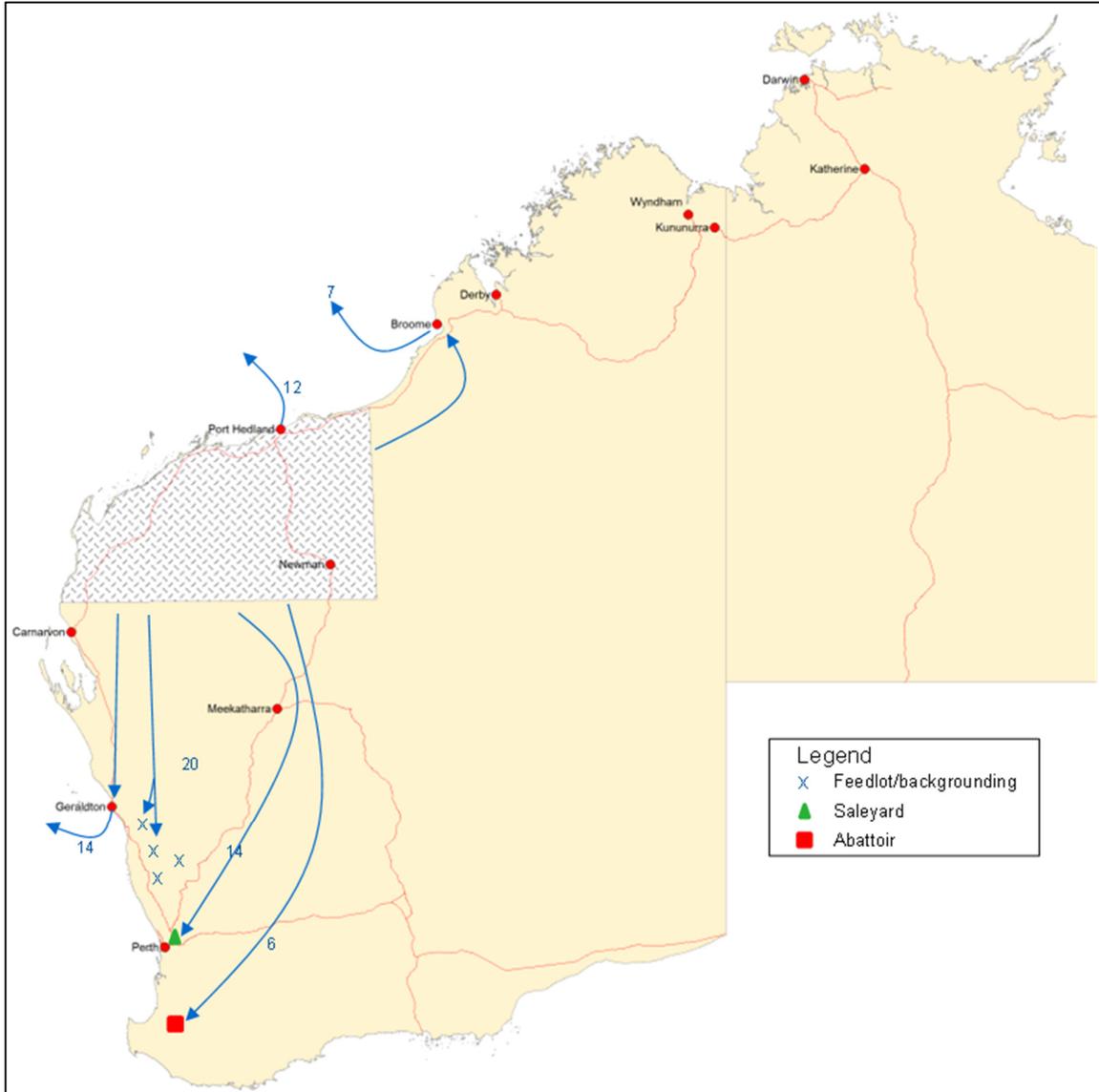
Pilbara producers are more diversified in the supply chain choices and make greater use of feedlots and backgrounding properties in the agricultural zone, as well as smaller numbers of live cattle exports through ports from Broome to Geraldton.

Map 2 shows that there are also some direct sales to abattoirs from Pilbara breeding properties and also via the Midland saleyard (now replaced by Muchea).

This map illustrates the greater variety of marketing options available to Pilbara producers over those available to producers in the Kimberley, and the lesser transport distances involved in getting cattle and beef products to market.

The isolation of the Kimberley pastoral industry from markets remains the most important concern and challenge in view of the instability of the live trade.

Map 2 - Cattle Movements from the Pilbara 2008 ('000 head)



4 WA POLICY DEVELOPMENT PLATFORM

4.1 GENERAL RANGELANDS DEVELOPMENT EFFORTS

Economic development of northern WA and the north of the continent in general is an important national issue, within which the challenges of the pastoral industry play only a small part. A growing understanding of the importance of Australia's trading relationship with growing Asian economies is the dominant imperative for development of the northern region, but there are many other reasons and considerations. Climate change has increased the focus on the potential for intensive agriculture in the certain regions, and this has ensured a focus on water planning and land tenure reform. Energy resources on- and off-shore have huge potential as export earners for the state and nation, but the ability to exploit these reserves hinges on the successful negotiation of cultural and natural heritage issues with indigenous owners and non-indigenous community interests.

Tourism and eco-tourism in particular is a growing industry, which brings its own management challenges to the authorities in the region.

The mining sector, mostly in the Pilbara, but increasingly in other northern regions is growing so rapidly as to warrant significant government attention to a range of infrastructure and demographic issues, including the development of new towns and cities to house workers and improve housing conditions.

The rapid growth of indigenous populations in the region is also a focus of concern regarding future employment and quality of life prospects for people in these communities.

These rapidly emerging growth industries and associated community issues and development challenges are being addressed by a range of studies and strategies, some of which have relevance to the development of the pastoral industry. In many respects, however, this industry represents a traditional, conservative way of life, as compared to the growth industries which have a more significant impact on the national economy and consequently demand greater attention.

Agencies representing or addressing the interests of the pastoral industry face huge challenges in their efforts to improve economic conditions for cattle producers, due to the absence of easy solutions and the competition from other sectors where growth prospects are more obvious.

Nevertheless, there has been a concerted effort by governments in recent times to respond to the challenges facing the Rangelands industry via regulatory reform and exploration of means to stimulate supply chain investment.

4.2 PASTORAL LEASE REFORM

The WA Department of Regional Development and Lands is leading a 3 year program to reform certain aspects of the pastoral lease administration. The current system of administration of pastoral leases is incompatible with development challenges in the beef industry and the region generally and is consequently under comprehensive review.

The aims of the process are to increase opportunities for the development of economically diverse rangelands communities, develop a contemporary vision for the pastoral region and improve environmental management of the lands.

It is also intended to increase the potential for private sector investment in development activity in the pastoral region through the reduction in regulatory and planning obstacles to development and the establishment of new business activities.

The role of the Pastoral Lands Board is also being reviewed, along with the valuation mechanisms for setting rents for pastoral leases.

A new type of tenure, the Rangelands Lease, is being developed to improve capacity for leaseholders to undertake new forms of economic activity, currently proscribed under existing lease conditions. This activity could range from development of non-core cattle-raising operations such as fodder production, through to unrelated activities such as tourism and resource extraction.

Stage 1 of the program involves the drafting of legislation creating the Rangelands Lease during late 2011. Full implementation will then commence from about 2013.

4.2.1 PROPOSED IMPACTS OF TENURE REFORM:

- Improved ability for producers to invest in activities ancillary to core pastoral activity (such as fodder production, centre pivots)
- Capacity for non-pastoral activities such as tourism and resource extraction to be initiated
- Development of one-stop shop options for approvals required to gain Diversification Permits

In addition to these formal reform processes, the responsible agencies are reportedly taking a less conservative approach to the issuing of diversification permits under existing Pastoral Leases. Where previously pastoralists have been dissuaded from applying for permits due to the perception of excessive red tape and lack of co-operation, the Pastoral Lands Board has reportedly been working to correct this perception and to assist pastoralists in making application for permits and in granting timely approvals where possible.

A small-scale abattoir development in the West Kimberley has already been approved under a Diversification Permit on the basis that it will service only the herd being bred and filled out on that lease. Other applications for centre pivots and similar developments are also being approved.

4.3 WATER ALLOCATION PLANS

Water usage is critical to many potential activities in the Kimberley and Pilbara, including fodder production and intensive grazing. The Kimberley climate is 'water-limited' and rainfall events are highly variable and seasonal. Rainfall is heaviest in the north of the region, but quite low in the south towards the Great Sandy Desert that separates it from the Pilbara. Evaporation rates are high, and the dry season is always a challenge on inland leases.

Groundwater offers an important and potentially dependable resource for the industry in the region, but is not yet well understood. There are substantial gaps in historical rainfall recording across the region, which make it difficult to estimate aquifer recharge rates in order to plan for groundwater usage. Some of these ecosystems have yet to be properly studied.

The Dept of Water has new regional water plans for each region, and is developing Water Allocation Plans for smaller areas within the regions, where the greatest immediate usage potential has been identified.

Use of ground water in some areas offers great potential for irrigation. The Lagrange water resource south of Broome offers 50 Gigalitres of water per year, of which only 12% is allocated to date (mostly for horticulture). Irrigation activities require both a pastoral diversification permit and a water licence.

Demand modelling by the Department of Water suggests that the supply of groundwater can keep pace with moderate growth in demand for irrigation, if carefully managed under best practice planning methods.

An Allocation Plan for the Fitzroy River area is also likely to identify large areas of potential usefulness in that area.

4.4 IRRIGATION SYSTEM RESEARCH

Large scale development of an irrigation sector using groundwater as it becomes available, will allow pastoral lease holders to invest in a local feed-on capability which will improve the capacity to fatten animals across all season types and progressively move them towards markets.

These activities will also provide the opportunity to regenerate native vegetation through focusing grazing on smaller areas on pastoral properties. They could thereby increase the carrying capacity of the Rangelands generally while helping protect native vegetation from overgrazing, particularly in dry times.

The development of 'irrigated mosaic' agriculture – small scale, widely distributed irrigation systems – for Northern Australia is being examined by CSIRO under a joint partnership between state and Commonwealth governments (CSIRO study abstract – Mosaic agriculture in northern Australia: assessment of sustainability and prospectivity). Where widespread irrigation schemes may not be feasible under the region's available water supply limitations, a mosaic approach could offer several theoretical advantages.

- It could provide the means by which local bred cattle could be significantly fattened before transport away from the area, reducing freight costs (on a per kg meat basis).
- The ability to implement both fodder production and fenced 'stand and graze' irrigated systems would greatly increase the carrying capacity of the land.
- Cattle production could continue on a year round basis, rather than be hamstrung by the inability to move cattle during the wet season.
- The CSIRO also suggests that greenhouse emissions could be reduced through the use of higher quality feed than the common tropical forages.

This study and others like it will no doubt improve the understanding of how irrigation can work across the northern Australian pastoral area, but a more targeted approach for the Kimberley and Pilbara from a supply chain perspective would be necessary to provide the impetus for change in this area.

4.5 MINE DEWATERING PROJECTS

Mine dewatering is an important process through which a by-product of one industry can be harnessed for the benefit of another, literally 'downstream'.

New iron ore projects in the Pilbara will require huge investments in dewatering, since much of the remaining resource is below the water table. This creates an opportunity to develop irrigation projects, both for fodder production and 'stand and graze' intensive cattle raising.

Rio Tinto's announcement (Feb 2011) of a major extension to its Marandoo mine east of Newman includes a commitment to a water management plan including a trial irrigation project (30,000 ha). This initiative would help reduce the mineral content of water currently running into rivers from the mine.

DAFWA is working with the company to support the project, which could provide sufficient hay (Rhodes Grass or similar) to fatten up to 10,000 head of cattle over 100 days. The intention of the company initially is to provide fodder for its own herds on its Hamersley properties.

This type of surplus water usage, if successful, could provide benefits to the pastoral industry, the environment and the mining sector, although there are technical (water quality) and infrastructure barriers to be overcome.

The ability to produce large quantities of fodder in these areas will be vital to the reduction of input costs for local producers, and could offer considerable environmental and conservation benefits. To realise these types of benefits, the state will need to engage in meaningful dialogue regarding the provision of infrastructure needed to capture and transport water to suitable properties where larger scale irrigation activities could be developed in the broader interests of the local Kimberley and Pilbara producers.

If a significant irrigation sector could be developed in the vicinity of some of the emerging mine developments, where water quality and geology was favourable, this would go some way towards improving the capacity to fatten cattle moving from north to south along a supply chain similar to typical Queensland chains.

An associated challenge would be the need to change herd genetics and composition, to favour increased in feed conversion rates over the hardiness and low stress characteristics of the Brahman herds. Feed conversion rates of 2-3kg per day would be required to generate returns on investment in the irrigation activity, which suggests that greater use of European breeds would be required to make this supply chain option genuinely viable in the longer term.

4.6 EXTENSION SERVICES

State agencies servicing the agricultural sector are working with pastoralists to improve herd genetics with a view to future diversification needs and the rise of alternative supply chain streams. These services will become even more important as the industry seeks to change the composition of herds in order to balance the live trade preference for bos indicus breeds versus the breeds, size and age characteristics generally required by the beef processors.

DAFWA and other agencies are also providing useful research services into commercial viability of fodder production and horticultural activities as part of the effort to develop the agricultural sector. This kind of work will become more important as producers seek means of investing in value-adding activities in order to survive.

4.7 SUPPLY CHAIN INTEGRATION

Further to the discussion in section 4.1 above, there is little evidence of genuine supply chain integration for the Rangelands beef industry, largely due to the absolute dominance of the live trade over other options. There is some history of attempts to integrate various components, and some producers have a range of interests at various points in the chain, but there is no parallel with the well-developed east coast chains.

A greater level of integration would provide the capacity for producers to extract value from the various activities involved in 'paddock-to-plate' management systems.

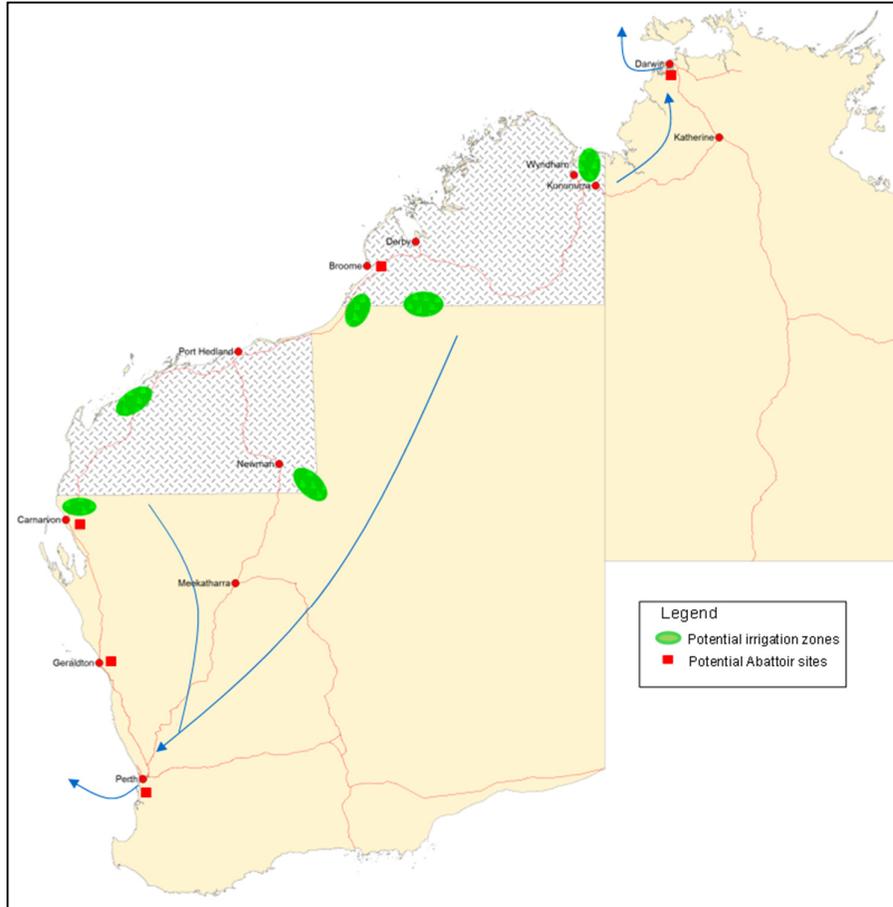
A classic Queensland integrated chain (such as the award-winning Australian Country Choice chain) involves centralised control of breeding, backgrounding, lot feeding, processing and marketing activities. ACC operates its own processing plant in Brisbane, and maintains supply of cattle from its own properties, supplemented by saleyard purchases. Its management information systems track the movement of cattle from property to property and monitor growth characteristics along the chain. It also has a strong partnership arrangement with Coles supermarkets for its marketing the majority of its beef production.

Some Western Australian processors have previously made attempts to develop their own property portfolios, but without success. The smaller scale of the industry in this state has not been sufficient to support a systematic investment in this type of activity.

The development of an irrigation sector, or a mosaic irrigation system might be a precursor to the development of a more interrogated north-south supply chain that could strengthen the southern processors and reduce the costs for producers. It could potentially stimulate entrepreneurial activity as producers and leaseholders see opportunities to value add and improve product quality. This in turn, could lead to opportunities for vertical integration activities along the chain.

Map 3 shows a more generic illustration of alternative future supply chains for the region, utilising new irrigated zones and possible abattoirs in Darwin, Broome, or other locations to the south of the Kimberley. The provision of the capacity to fatten cattle closer to the breeding areas would also have an impact on the commercial decisions of processor companies regarding the potential for more local processing.

Map 3 - Potential processing supply chains



4.8 CO-ORDINATED APPROACH WITH NORTHERN TERRITORY

Ideally, a livestock industry strategy for the Rangelands should be developed with the co-operation of the Northern Territory government, given the potential impact of NT developments on the Kimberley producers in particular.

At present, the NT government is contributing with the WA government to the development of a joint strategy through the Commonwealth initiated Northern Australia Beef Strategy project, which provides a forum for Commonwealth and state agencies to work together for the benefit of the northern industry as a whole.

At present, however, the longer term aims of this effort have been overtaken by the urgent need to stabilise the Indonesian live trade and instigate supply chain monitoring systems. The NT government is also deep in consideration of the AACo abattoir proposal, which will have significant ramifications for the longer term strategy development. In this regard, specific engagement with the Northern Territory regarding a WA abattoir should take place after these issues are resolved, and ideally via the Beef Strategy discussions.

4.9 POTENTIAL FUTURE FOR THE KIMBERLEY PASTORAL INDUSTRY

If the Kimberley cattle industry was to be developed as outlined above, with irrigation areas and more intensive grazing capability through regulatory reform and a market diversification policy, this would in itself have an impact on the question of the need for a local abattoir.

The capacity to fatten cattle locally and consistently across seasons, along with the presence of a major Northern Territory abattoir changes the analysis. Map 3 illustrates a pattern where Kimberley producers have the choice of access to live trade, an improved north-south supply chain to Fremantle, and a west-east chain to Darwin. Another option, use of a Broome abattoir, would be attractive to producers, but would bring the risk of under-utilisation if the other chains are successful.

The key to viability of the Broome abattoir under these conditions is a substantial increase in carrying capacity and annual turn-off. While this growth paradigm is in line with strategic directions for the northern Australian cattle industry, it can only be successfully pursued if Asian markets grow sufficiently to maintain cattle prices in the long term.

If a Broome abattoir was to be built, it would probably send its product to market via the Port of Fremantle. Cheap road freight for containerised product in the north-south direction, combined with the sea-freight advantages of Fremantle over Darwin would determine this. There is potential for shipping rates and frequency ex-Darwin to improve, but no such scenario for commercial shipping ex-Broome. The state-subsidised shipping service linking Broome to Fremantle does provide a theoretical means of getting product to market more cheaply, but the current schedule (17 day cycle) is insufficient and rates would probably require further subsidisation to improve on road freight rates available.

A Broome abattoir would therefore be competing directly with southern WA processors unless it could differentiate its products sufficiently – which would appear unlikely given the quality of cuts available from the cattle raised in each zone.

In short, a significant Broome abattoir would struggle to compete for market share against both a Darwin abattoir and the southern WA processors as well as the live trade. While providing much needed employment and community benefits, it would not be likely to generate a return on capital and would surely suffer from inability to attract cattle from outside its immediate environs in the West Kimberley.

In this context, a niche abattoir such as the private development already approved at Kilty Station, near Broome, is more likely to succeed than a major facility as analysed in Stage 1 of this project. The Kilty Station initiative is understood to have been justified based on internal synergies within the group of companies that are building it, and a specific target market. In this respect it is similar to the project proposal being developed by Australian Agriculture Company (AACo), and the strategies that are driving the development plans of the larger processors in the market. The way forward for these operations is in supply chain integration, maximising natural geographic advantages and managing products from 'paddock to plate'.

5 AUSTRALIAN PROCESSING SECTOR

5.1 ENVIRONMENT SCAN

There has been considerable consolidation within the Australian processing sector in the last 3 years, particularly involving the largest processors. In 2007, the company with the greatest market share was JBS Swift at 16%, followed by Teys Bros at 12%. Following a series of recent acquisitions, these two companies now control 42% of total Australian production.

Brazilian-owned JBS Swift is now the largest protein producer in the world.

Some of these changes have involved horizontal integration (i.e. acquisition of additional processing facilities) but many have been aimed at synergistic vertical integration through the supply chain. For instance, the Teys Bros joint venture with Cargill Beef Australia brings substantial east coast processing capacity together with grain marketing, feedlots and international supply chains.

Some of the larger companies are now in a position to take a global view of expansion opportunities and look at Northern Australia as a gateway to Asia of increasing significance.

The Indonesian live export crisis has been the catalyst for a re-examination of the traditional view amongst processor companies against investing in Northern Australia.

While the focus of the livestock industry and the state(s) and Commonwealth governments has been on re-establishment of the trade, some processors are preparing for a future where there will be an improved investment climate for northern processors. The efforts of governments to develop strategic plans for the northern pastoral industry and for economic development in general, are a signal to the beef industry that structural changes might occur, bringing opportunities, particularly for 'first movers'.

The proposed investment in a Northern Territory processor by AACo is another integration example, where the abattoir would complement the breeding and fattening properties and stock owned by the company.

The AACo proposal remains unconfirmed, since it depends on some exogenous factors such as the agreement by state and Commonwealth governments to fund essential infrastructure both in the vicinity of the site and at the Port of Darwin. These improvements include:

- Improved supply of electricity, water, gas and telecommunications to the site
- Local road improvements
- Provision of rail sidings to facilitate transport or refrigerated containers to the Port of Darwin
- Provision of powered points at the port for accumulation of refrigerated containers

In addition, the company is seeking assistance in the provision of local community services (health, child care, training etc.) to support the workforce (estimated 270 jobs, plus 230 jobs in the construction phase). This is necessary due to the impact of so many new jobs in a non-metropolitan area with only small rural villages as population centres.

If the AACo Board determines to proceed later in 2011, construction and commissioning will take only around 12 months. The proposed development is a highly significant investment in the pastoral industry, marking the first noteworthy development since the rise of the live export trade over 20 years ago.

Livestock producer organisations in WA, NT and Qld are all beginning to explore with government and processors the potential for northern developments as alternative to live export and southern supply chains, identifying growing freight costs and lack of supply chain power as problem areas.

Road freight transport costs are being driven upwards across the Australian economy due to a combination of factors, including:

- Demand for truck drivers in the mining sector
- Diesel fuel prices
- Aging workforce
- Difficult working conditions in outback regions

A local NT processor would provide the impetus for significant changes to supply chain costs and structures, by introducing a competitive path to market. The short distance from port, with potential access to road and rail transport options, provides incentive on shipping lines and the port authority to develop a streamlined path into Asian markets, which is currently only available via Brisbane or Fremantle.

The Port of Darwin is still developing as a container port, and only handles around 90,000 tonnes of containerised product in total. Consequently it has infrequent ship calls (roughly weekly) compared to the major competing export ports, which can depend on daily container shipping departures to Asia and the Middle East. The addition of a significant new export task, however, would be very important to the port's ability to attract more shipping lines, reduce sea-freight costs and improve frequency. The mutual benefit to the port authority, the Territory economy, the pastoral industry and the individual companies investing in capacity serves to greatly improve the overall investment climate and should result in reduced supply chain costs.

There is also evidence of Asian investor interest in Australian meat supply, driven by food security concerns and commensurate cost increases. In recent times there have been several approaches by importer interests from South-east Asia and increasingly, China, seeking niche opportunities to gain access to processed meat to meet forecast new demand in emerging economies.

5.2 CONSULTATION WITH PROCESSING SECTOR

For this project, a wide range of major Australian processors were approached for interviews. Initial enquiries were met with modest interests, but following the live export crisis, a greater level of interest was detected. Most processors readily agreed to interviews or telephone discussions, while a few declined due to lack of interest and/or commercial capability.

The timing of interviews was originally planned for May/June 2011 and arrangements were made for several visits during this time. The Indonesian live export crisis in June 2011, however, had a considerable impact on the industry and interviews were delayed in order to allow processors time to assess the outcomes of the situation. The crisis appears to have had the effect of focusing some more attention on the potential expansion opportunity into the Kimberley, and clearly there has been a renewed interest in the need for greater sophistication in the northern Australian supply chains.

As discussion prompts, processor representatives were (informally) asked questions along the following lines:

- Would you consider investing in an abattoir in the Kimberley?

- What impact does the current state of the live export industry have on your position?
- What impact would the emergence of a feed-on industry through irrigation and/or mine dewatering projects have on your position?
- What size kill would seem appropriate?
- What is your view of existing bos indicus blood lines?
- How many months per year could a plant operate?
- What scale and type of public assistance would be needed to assist the business case?
- Would you be interested in a joint venture arrangement with other processors?
- How would you manage labour retention issues?
- What type of change in the industry would be required to increase your interest?

The major players gave the impression that they had considered the issue of the Kimberley opportunity in some detail, but had drawn different conclusions. The views and ideas provided to the team are summarised here.

In order to protect the commercial confidentiality of processors, no specific company comments are reported here.

5.3 SUMMARY OF PROCESSOR VIEWS

- The disadvantages of the Northern WA pastoral industry are well known:
 - Lack of steady rainfall, long wet season
 - Bloodlines oriented towards live Indonesian market
 - Isolation from processed meat markets
 - Lack of annual turn-off to support processing
 - Expensive labour and energy costs
- Many processors do not have the scale to raise capital needed for high-risk green-fields investments. Some of the larger businesses, however, are now better able to access development capital than in the recent past.
- In the event that a Kimberley development was to be supported by government as a regional development initiative, some large processor companies expressed interest in being involved, both as operator and as an investor.
- There is a clear expectation that a large share of the supporting infrastructure required for a processor development would need to be supplied through public funding. Some contribution to capital and/or financing costs of the development would likely be required as part of any deal. The risks associated with a unilateral investment of \$30-50m in a major facility by a commercial operator would be too great in view of the complex trading environment.
- The proposed AACo facility in Darwin provides a model for a public-private partnership that would appeal to processors. Significant capital support for infrastructure (both physical and community) would be provided by governments, while operational and marketing risk would be taken by the commercial operator. The source of capital for the development itself would appear to be the main negotiating point for a facility in the Kimberley facing its geographic and other competitive challenges.
- Any commitments by government to such a project would be in recognition of the value of the proposal to the local community, indigenous employment, pastoralists and the

broader economy. Most processors would rather have the unilateral power to operate and manage a facility in the direct interest of the company, despite the public funding support that would be necessary.

5.4 OPERATIONAL MODELS

There is no clear consensus on the scope of operation best suited to the Kimberley task. This would be determined by the national market assessment of the processor company involved, and its own market supply chain needs.

A standard abattoir operation includes slaughter, chilling and boning of the carcass, with the resulting products packaged in the branding of the product owner. A comprehensive operation of this type was analysed in the Stage 1 report, and estimated to require a maximum staffing level of 191 people for a single shift 5 days/week operation processing around 100,000 head per year:

Activity	Staffing
Slaughter	65
Boning	52
Chiller room and packing etc	36
Engineering	10
Administration	28
Total	191

It is likely that in the early stages of the abattoir's life it will be dealing mostly in lower quality cuts, for the grinding beef market. In this scenario, it could be beneficial to construct and then manage the facility in a staged manner, with some downstream activities taking place elsewhere along the path to market. Provision would be made in the design of the facility for these functions to be developed later, if beef quality and trading conditions allow. This would help to reduce the initial cost of construction and minimise start-up staffing costs to some extent.

5.5 ALTERNATIVE OPTIONS

5.5.1 CAPITAL COST OF ALTERNATIVES

The construction costs of different types of facilities would not be expected to vary greatly from the basic cost estimate provided for a standard integrated abattoir in the Stage 1 study. The table below illustrates the probable scale of differences.

Construction cost element		Cost estimate		
	Option	Option 1	Option 2	Option 3
	Description	Slaughter, chill, boning	Slaughter, chill quarter only	Hot boning
Infrastructure	Mains electrical supply	Excluded	Excluded	Excluded
	Mains water supply			
	Water storage and treatment facility			
	Natural gas supply line			
	Sewerage from amenities			
Site works and building preliminaries	Earthworks and effluent ponds	\$2,800,000	\$2,800,000	\$2,800,000
	Fencing			
	Temporary facilities			
	Soil testing and surveys			
	Roadworks and carpark			
Building works	Yards, holdings and lairage	\$9,650,000	\$7,250,000	\$8,900,000
	Main process plant, chillers, freezers, loadout			
	Boiler house, engine room			
	Render building			
	Administration and amenities			
	Workshop			
Process equipment	Main process equipment	\$12,700,000	\$11,100,000	\$12,700,000
	Rendering equipment			
	Hot water boiler, heat exchangers			
	Plate freezers			
Services	Refrigeration system	\$6,300,000	\$5,850,000	\$6,200,000
	Ventilation equipment			
	Effluent treatment and manure handling			
	Piped services			
	Fire services			
	Electrical distribution and control			
Land acquisition and connection to utility services		Excluded	Excluded	Excluded
	Sub Total	\$31,450,000	\$27,000,000	\$30,600,000
	Design and project management	\$2,400,000	\$2,100,000	\$2,300,000
	Total cost of abattoir	\$33,850,000	\$29,100,000	\$32,900,000

5.5.2 SLAUGHTER, CHILL, AND QUARTER (NO BONING)

The first alternative to a standard abattoir operation is to slaughter, chill carcasses, quarter the carcass then load quarters directly into a refrigerated container and ship out a chilled product.

The chilled quarters would be trucked to a boning facility in a major centre for further processing. In this case, the boning rooms located in metropolitan Perth would be used for export product being shipped from Fremantle, but Darwin could equally host a boning room if shipping ex-Darwin was preferred. If the AACo facility was to proceed, boning services might be available there before transfer of processed cuts for export.

The advantage of this proposal is a reduced building footprint with no boning room. The refrigeration requirements are reduced due to the reduced building area and the product being chilled rather than frozen.

The number of operators required in the remote area is also reduced with a larger and potentially better skilled labour pool available in the major centre for the boning and any further processing activities.

Off-site boning of chilled product would provide potential for a range of higher value products to be produced without the local staffing issues.

5.5.3 SLAUGHTER, HOT BONING AND PLATE FREEZE

The option 2 alternative to a standard abattoir operation is to slaughter and hot bone at the remote site. The hot boned product would have a larger proportion of grinding beef although some primal cuts would be available.

The removal of the need for carcass chillers slightly reduces the building footprint.

The refrigeration load is not significantly reduced as the product temperature still has to be reduced from 40C to minus 18C where the major portion of the load is in the phase change to a frozen state.

The hot boning operation does require fewer operators compared to the chilled boning operation however the total number of operators is only slightly reduced.

The plant output of frozen cartoned product would be trucked from the site in a freezer container and could be delivered directly to a port for shipping.

As the table shows, the first option makes the greatest difference to staffing levels, but neither makes a significant difference to overall capital development costs.

Activity	Indicative capital cost	Typical staffing level	Positives	Negatives
Standard - Slaughter, chilling and boning	\$34m	191	Conventional operation able to serve most markets	Highest cost
Alternative Option 1 - Slaughter, chill and quarter	\$29m	120	Reduces initial capital and labour, boning capability can be added later	Dependent on links with Perth boning rooms. Also some export markets require slaughter and boning at same location
Alternative Option 2 - Slaughter and hot-boning	\$33m	175	No carcass chiller costs	No ability to generate value from better quality cattle

5.6 COMMERCIAL GAP ISSUES

It is premature to attempt to define the extent to which public sector assistance is needed to bridge the 'commercial gap' to full feasibility for a facility not yet conceived or designed. The level of commercial gap will vary from company to company, depending on their scale, their market vision, synergistic potential and appetite for risk. However, the gap is clearly significant, due to both the operational challenges and the uncertainty over the future of the live trade.

The easiest means of helping bridge the 'gap' in any development business case will be via one-off contributions to development costs, including land and basic services and infrastructure. Any systemic operational cost problems outside of capital cost treatment would indicate fundamental viability issues and would constitute a strong argument against any level of government support.

5.7 GOVERNANCE/MANAGEMENT MODELS

A number of different governance and management models for a Broome facility have been considered in the course of this study. Most Australian beef abattoirs are run on standard lines – fully integrated slaughtering, chilling and boning activities on a centralised site under the ownership and management of a specialist beef production company. However the case under consideration here is a special case, with unique issues of scale, isolation and risk that make it prudent to consider a full range of other options.

5.7.1 STANDARD INTEGRATED MODEL

The standard model is unlikely to be achievable, given the capital investment involved and the potential difficulties in hiring local skilled staff in sufficient numbers. The limited throughput is also an inhibitor and standalone return on the large investment in this type of facility would be not commercially attractive.

5.7.2 PUBLIC-PRIVATE PARTNERSHIP

A more commercial feasible means of establishing a standard integrated abattoir would be through a partnership between government and a private processor company. Under such an arrangement, the company would design, build and operate the facility, but government would provide land, services etc and would underwrite the improvements to transport and other infrastructure required, which could be considerable. In some circumstances, government could also consider providing financial assistance to the company in the form of low-interest loans etc.

This kind of model makes the investment more palatable to the processor and improves the commercial rate of return. However, both parties remain exposed to operating risk and the potential for low overall economic return, as well as financial performance. The government agency may also have difficulty in resolving its support for a private investment with the likely service outcome – that the processor will operate in order to serve its shareholders rather than provide a general community service.

5.7.3 CO-OPERATIVE MODEL

The Northern Meats Co-operative in Casino, NSW, is the only significant example of an abattoir run on co-operative lines in Australia. Its model is a historic one, having been in operation over 70 years. Over 1600 local and more distant producers (including from Queensland and NT) are members of the Co-operative, and pay only a small annual fee, levied at \$0.25/share, of which each member owns only 250.

The facility provides a full service of slaughter, chilling, boning and packaging on behalf of up to 40 different 'Operators'. These Operators are companies who purchase cattle from co-op members and then pay fixed rates for the NMC to process them to fill specific orders from the Operators. NMC will then manage transport and logistics if required into the Operators domestic markets or to the ports of Sydney or Brisbane.

The Co-operative nature of the business has some benefits in terms of tax treatments and producer loyalty, but has some downsides in relation to the ability of management to pursue long term development plans and raise capital. Board members serve short terms, so management continuity can become compromised. The structure, however, does suit the local environment of many small livestock producers who are committed to the ongoing survival of the facility and the 'service kill' model appears to work well to achieve competitive prices from the various 'Operators'.

On balance, it would seem unlikely that any new co-operative based facility would set up as a formal Co-operative, given its management challenges. The Co-operative structure is a rarity in the commercial world now. However, there is some appeal in the model for the Kimberley environment, given the need for disparate pastoral leaseholders to demonstrate a commitment to a processor stream if one was to establish and survive in that environment. The difference, however, would be the sheer distance between properties and the relatively small number that could own shares in a processor, as well as the historical cultural identity of Kimberley cattle people as individualists.

While some form of producer commitment might be important to a Broome abattoir, the formal co-operative model is not likely to offer the best form of governance in this instance.

5.7.4 PUBLIC OWNERSHIP, LEASED TO OPERATOR

In view of the isolation and risks, a facility fully funded from public sources would remove one of the key problems for investors. If this commitment were made, there would be a range of operators expressing interest in the management of the facility, albeit essentially in their own corporate interest, rather than on the basis of providing some form of community industry benefit.

A genuine return on investment of this scale by state or local government would be very small and would probably not meet state investment business case criteria. A further concern is that an operator in a leased business of this type would not be under any direct competitive pressure from other processors, and would only offer the prices it needed to in order to undercut the live trade price or the price (less freight cost) of the more distant processors in Perth or Darwin. Thus the benefit to the community may be lower than hoped, which would further weaken the overall return on the public money contributed.

5.7.5 PUBLIC OWNERSHIP, WITH LEASED BONING ROOMS

As a variation on the model above, a slaughter facility with more than one boning room would provide the level of competition missing from the previous model. Separate boning rooms would be leased to, and managed by, different processors, offering competing prices to producers. The slaughter function could be operated by the primary lessee or the public authority itself.

The main difficulty with this approach is likely to be scale, with the staff and facilities needed to operate two boning rooms likely to exceed the overall demand for services.

5.7.6 PUBLIC OWNERSHIP, WITH CO-OPERATIVE MANAGEMENT

A hybrid model of the co-operative approach combined with public capital has some potential appeal. The local authority would develop and maintain the building and basic facilities, but lease it to a co-operative representing the interests of local pastoral producers. This co-

operative would then manage the services provided on the slaughter floor on orders from competing beef marketing companies, somewhat similar to the operating model used in the Northern Meat Co-operative but without the formal Co-operative structure.

The co-operative company would manage the operating risk but without the financial burden (essentially depreciation). Its lease costs would not provide the constructing authorities with a guaranteed return on investment, but a repayment structure could be arranged based on contributions in good seasons rather than poor. The co-operative might appoint a commercial operator to physically run the facility, but would manage the relationships with marketers and logistics providers directly.

This model still exposes the public sector to capital risk and low direct returns on investment, but does offer greater potential for general returns and benefits to the producer group as a whole, rather than an individual company. This management model might appeal to the community and also suit the difficult commercial circumstances better than the others.

The table below summarises these governance and management options

Approach	Positives	Negatives
Fully private standard model	Clear commercial incentives on operator	Difficult to guaranteed returns to the state on any public capital assistance; may not be sufficient throughput to warrant staffing
Public-private partnership	Shared capital risk, improved commercial return for processor	Low economic return to government, services provided at discretion of company
Co-operative model	Achieves engagement and commitment of producer base; some tax benefits	Difficult to raise capital, can be hard for management to escape shareholder control
Publicly constructed and owned facility, leased to operator	Overcomes investment hurdles	May not provide any price benefits versus live export
As above, but with competing leased boning rooms	Provides more competitive options for producers	Higher capital cost, staff mobility issues
Public facility, leased and operated by local producer co-operative on behalf of competing buyers	Provides more competitive options for growers; leaves marketing to professionals	Local co-operative responsible for managing throughput and staff, but no capital costs or marketing expertise required

6 ABATTOIR LOCATION

6.1 BROOME

Stage 1 of the report identified Broome as the optimal location for a West Kimberley abattoir. Broome is the largest population centre in the region by a considerable margin and the greatest source of potential labour. Broome has 11,500 people, while Derby, 220km away has 3,500. Kununurra, the only other significant town also has 3,500 people. While small towns have supported abattoirs in the past, the challenges of attracting and retaining skilled labour in competition with the mining sector would suggest that the host town should have considerable scale, community services and amenity.

Broome also has a port serviced by a regular coastal container shipping service and an industrial sector with potential to provide supporting services for the operation of an abattoir. The town has an established freight transport sector, assuring the provision of competitive freight services for processed meat product and for the movements of cattle between properties and holding yards.

6.2 IMPACT OF OTHER DEVELOPMENTS ON LOCATION OF KIMBERLEY ABATTOIR

The catchment area for a Broome abattoir would extend across the length of the Kimberley region and southwards into the northern Pilbara region, assuming competitive prices could be paid for cattle, however, the development of other private or publicly funded processing plants in Northern Australia will have an impact on the extent of the catchment.

A major facility near Darwin as currently being planned by AACo would have a potential capacity to attract cattle from the eastern Kimberley, depending on its supply chain model. Kununurra is 780km from the site of AACo abattoir, but almost 1100km from Broome. In terms of distance for the carriage of live cattle, the trip to Darwin may be simpler and cheaper than that to Broome.

The impact of the Darwin facility on a Broome processor would depend upon the capacity of the AACo plant to process cattle originating from outside the company's own portfolio of properties. If it proceeds, the AACo plant will have the capacity to process over 300,000 cattle per year, although it will no doubt operate initially on smaller volumes via a single shift. The capacity of this plant would place it high in the list of national processors.

AACo properties currently carry over 500,000 head and turnoff over 150,000 head per year. Total Northern Territory annual turnoff is about 600,000 head, of which over half is usually exported live through Darwin and Wyndham, the remainder transported to southern Queensland for fattening and processing. The AACo facility will theoretically provide slaughter capacity for up to 50% of total NT turnoff. The impact of this facility on NT cattle movement patterns will obviously be significant, but hard to predict given the uncertainties over:

- The future scale of the live trade
- The ability of AACo and other processors to develop markets for additional processed meat
- The management model applied by AACo
- The competitiveness of the AACo-Darwin-Asian market supply chain with the traditional North-south Queensland supply chain

At this stage, none of these factors can be determined in advance. It is clear that the AACo facility will provide a potential market outlet for East Kimberley producers, which would have some limiting effect on the potential throughput available for a Broome processor. It could also affect the viability of a Broome processor by increasing competition for markets for new beef products.

West Kimberley producers would be unlikely to benefit from a Darwin facility, (as compared to a local Broome facility) as they would tend to be crowded out by NT producers in times of high processor demand for cattle, with a live cattle transport distance to Darwin at least 1000km further than most NT producers.

In the scenario where the live trade returned to 2009 levels, then a Broome processor would have more survival difficulty than the AACo plant, unless the Broome supply chain model could match the level of integration that AACo can depend on (between producer properties, feed lots and abattoir). There may be some cost-to-market advantage to Broome over Darwin based on freight supply chain costs via Fremantle and Darwin into Asia and the Middle East, but overall the Darwin facility would be in the best position to maintain reliable supply through difficult times.

Any other developments in the Kimberley region will also have an impact on potential catchment numbers, depending on the scale of the operation and the extent to which they cater for unaffiliated producers' turn-off.

6.3 IMPACT OF BROOME ABATTOIR ON OTHER DEVELOPMENTS

The development of a Broome abattoir, especially with the support of government, would also have some impact on the viability of other processing initiatives in the region. The current trading environment has led many pastoral companies to consider their own options for improving supply chain options for their products, including processing facilities. The most developed and visible of these proposals is that at Kildo Station, 60km to the east of Broome. This project aims to capitalise on its development of a small irrigated fodder production area, to fatten its cattle sufficiently for local slaughter, as well as for live export. The company already has a vision for a pathway to niche domestic markets for its processed product using pre-existing supply chain assets.

While this facility is not designed to provide a general service to the Kimberley pastoral industry, it would inevitably offer indirect economic advantages to the region and more direct benefits to parts of the local industry. Once developed, it could act as a stimulus for similar activity elsewhere, or grow into a larger operation with wider industry benefits.

The development of a larger processing facility in or near Broome would provide competitive pressure for small operations such as at Kildo, and would certainly serve to weaken business cases for others. A clear statement of government intent in this regards at the appropriate time will be necessary in order to provide a suitably clear investment environment for local entrepreneurial pastoralists to bring their own investment plans to fruition.

Conversely, a decision to support a Broome abattoir is unlikely to affect the viability of the AACo proposal, due to its superior location in relation to cattle supply and the Asian market, as well as its place in the company's overall vision for integration of its supply chain.

6.4 INDUSTRIAL AREAS IN BROOME

Broome has a traditional industrial area to the south of the town, adjacent to the port precinct, as well as a light industrial zone closer to the town. The original Broome abattoir was located in the heavier industrial area. The nature of abattoir activity is such that this type of activity is no longer permitted in proximity to residential or other areas where people are likely to be affected by odours and waste treatment activities etc. Abattoirs require significant buffer zones and must meet strict environmental criteria regarding the management of effluent and contaminants on site. In Western Australia, the EPA standards include requirements for the 'Separation between Industrial and Sensitive Land' for different types of industrial activity. Abattoirs are required to provide 500-1000m of separation, 'depending on size'. This requires any abattoir to be well away from any residential or commercial areas, and usually results in their occupation of rezoned agricultural land.

LandCorp is developing with Broome Shire a new industrial precinct about 8km north of the town centre on Broome Rd, adjacent to the proposed site for the relocation of the airport, currently sited in the centre of town. This precinct will cater for industrial and transport activity related to energy sector growth in particular. This site is shown in pink to the south of Broome Rd on the town planning scheme map.

The Broome Rd site (Stage 1) will consist of around 300ha of serviced land, but will cater for 'dry' industries only, largely due to the tendency of the area to drain in Ramsar-listed Roebuck Bay during the wet season. It is likely that an abattoir, even with properly contained waste water and effluent treatment arrangements would not qualify as a 'dry' industry. In any case, the requirement for a buffer zone would probably sterilise too much of the estate to be viable.

The Planning Scheme shows that land adjacent to Broome Rd further east of the new industrial estate is zoned for rural residential and horticultural use. Once the border of the Planning Scheme is reached at about 25km to the east of the town, development applications are managed under an Interim Development Order under the jurisdiction of Council.

Land in these areas is pastoral leasehold and is also subject to the provisions of the Land Administration Act 1997, under the management of the Pastoral Lands Board.

The Indigenous Land Corporation (ILC) has a property at Roebuck Plains near the intersection with the Great Northern Highway 34km to the east of Broome. This property is a 283,000 hectare cattle station and training facility, and in 2009 developed a business as an export depot, holding cattle destined for live export through Broome.

Land on this station or nearby may well be suitable for development for an abattoir, offering the required buffer zone distances, power and bore water as well as access to staff training facilities. The ILC manages businesses and pastoral properties around Australia which mostly serve as training facilities and revenue generators for nearby indigenous communities.

One such facility is the Gunbalanya Station in Oenpelli, Arnhem Land, NT, which has a small meatworks on site and provides training for meatworkers. This meatworks is small, handling only 50 animals per week, but demonstrates the ILC's capability to develop pastoral leases for non-core pastoral purposes.

The training infrastructure for indigenous labour in Broome is significant, and an abattoir located less than 30 minutes by road from town and close to Roebuck Plains Station, or affiliated with it, would have some advantages in securing a labour force. Meat processing would be more closely related to traditional pastoral activities of aboriginal workers than mining employment, for instance, and would suit local people not interested in leaving their home country to find work.

A project to develop an abattoir at or near Roebuck Plains would fall within the ambit of the ILC's capacity to support projects that 'relate to the managed use, care or improvements of Indigenous-held land' (National Indigenous Land Strategy 2007-12).

The ILC has indicated informally that it would be interested in pursuing a potential role in the establishment and operation of a processor on its property in view of the synergies with its existing operations and its close affiliations with the indigenous labour programs.

7 FINDINGS

7.1 NEED FOR A STRATEGIC PLAN FOR NORTHERN PASTORAL INDUSTRY

The 2011 ban on live export is unlikely to signal the end of the trade. Live exports will continue but previous growth forecasts will not be met and volatility will increase.

The Kimberley region in particular will suffer from any reduction in demand from Indonesia and other sources. The development of greater sophistication in the northern pastoral industry is of paramount importance.

Before an abattoir is designed, co-ordinated attention should be paid to the development of a feed-on sector via a range of policy activities which are already underway, but not totally co-ordinated. These include land tenure reform, identification and tapping of new groundwater resources, increased use of irrigation for fodder production and grazing, and support for indigenous industrial employment and planning for energy developments.

A formal plan for the integration of these activities as they relate to improvements in Northern WA beef cattle production and marketing should be sponsored by government and industry bodies. Such a plan would identify the stage in industry development when the introduction of a local Kimberley processor would be of most benefit.

Development of an irrigation industry to support fodder production as well as more intensive grazing in locations where groundwater resources are sustainable is an important precursor to any public sector support for a Kimberley abattoir. A significant irrigated feed-on sector would lead to improvements in herd genetics and a gradual orientation to breeds with greater feed conversion rates and compatibility with beef market tastes.

A feed-on sector of this nature, in line with the 'mosaic agriculture' approach, would open up a variety of supply chain options for Kimberley producers including north-south and west-east processing options as well as local processing.

7.2 IMPACT OF A DARWIN ABATTOIR

A new abattoir in Northern Territory, if developed, will drive a wedge into the dominance of the live export trade and will be of some benefit to Eastern Kimberley producers. The Western Kimberley and Northern Pilbara, however, will remain significantly distant from a processing option. A Darwin abattoir would capture some share of Kimberley production and would compete effectively with any West Kimberley abattoir due to supply chain to market advantages.

The development of the proposed AACo facility near Darwin would have a significant impact on the potential viability of a Broome abattoir, by providing producers with access to an improving gateway to Asia via Darwin. Broome would be disadvantaged in relation to both this facility and existing southern WA processors.

It would be prudent to delay any significant action in relation to a Kimberley facility until the AACo development decision is made.

If the AACo facility proceeds, a niche operation in the Western Kimberley is more likely to succeed than a significant standard integrated model of abattoir, due to internal company synergies.

7.3 DEVELOPMENT OF A BROOME ABATTOIR

If it is determined that Broome should have an abattoir, a location to the east of the new Broome Rd Industrial Park, potentially affiliated with the ILC pastoral industry training property at Roebuck Plains would appear to be the best location at present.

Commercial forces alone are very unlikely to bring about the development of a new processor in the region – some form of government assistance will be necessary. This assistance would probably take the form of provision of some infrastructure, services etc, and potentially some contribution to the cost of financing construction.

Notwithstanding this, there has been significant interest from some processors in exploring the means of making an investment commercially viable. There are several management models that could be explored in discussions between processors and government agencies, including freehold of land and plant, leasing of same from local authority, as well as different financing models.

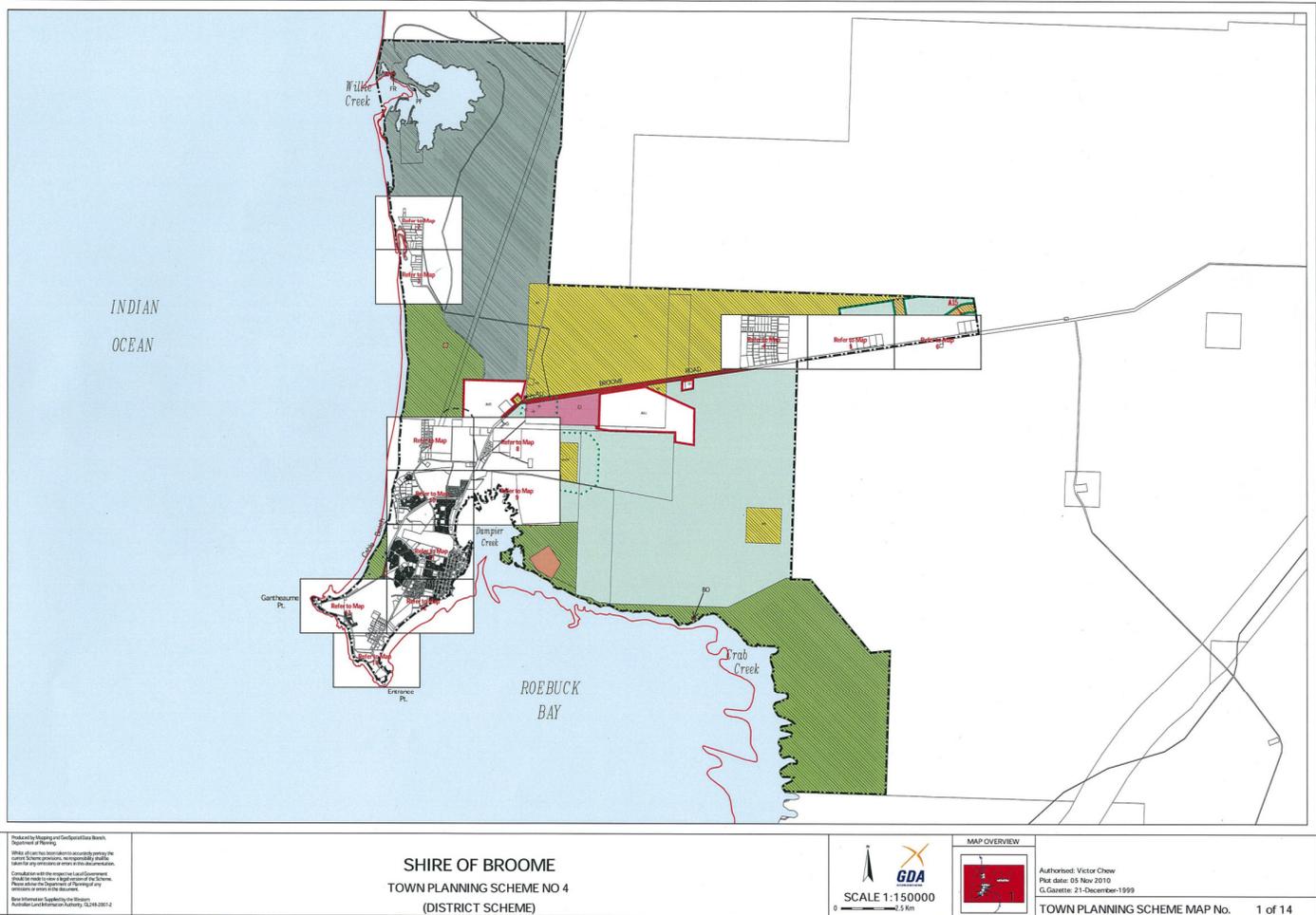
If discussions with interested companies do not lead to satisfactory commercial outcomes, the government could investigate other potential governance/management options. Of these, a system under which a co-operative of local producers managed the actual business on behalf of competing marketers might prove the best suited to the local industry circumstances.

The government would benefit from some initial bilateral scoping discussions with interested industry players on a confidential basis in order to develop a good sense of commercial drivers. These could include processor companies as well as pastoral industry representatives that may be interested in operating a co-operative under a zero-capital model.

Depending on the extent to which a role for public funding is deemed necessary following these discussions, it may be useful to initiate an open Expression of Interest (EOI) process for the development of an abattoir at a nominated site.

8 APPENDIX – BROOME PLANNING SCHEME

Broome Planning Scheme



Key to Broome Planning Scheme Map

LOCAL SCHEME RESERVES	
	CIVIC & CULTURAL
	COASTAL PARK
	ENVIRONMENTAL CULTURAL CORRIDOR
	HIGHWAYS & MAJOR ROADS
	IMPORTANT ROAD
	LOCAL ROADS
	PARKS & RECREATION
	PUBLIC PURPOSES
	PUBLIC PURPOSES DENOTED AS FOLLOWS:
A	ABORIGINAL
ADP	ACCESS/DRAINAGE/PARKING
C	COMMONWEALTH
CALM	CONSERVATION AND LAND MANAGEMENT
CEM	CEMETERY
CH	COURT HOUSE
CU	CUSTOMS
CWA	COUNTRY WOMENS ASSOCIATION
D	DRAIN
E	EQUESTRIAN
FB	FIRE BRIGADE
H	HOSPITAL
HS	HIGH SCHOOL
M	MUSEUM
MS	MOTOR SPORT
P	PUBLIC PURPOSES
PA	PARKING
PCYC	PCYC
POL	POLICE
PR	PRISON
PS	PRIMARY SCHOOL
R	REFUSE SITE
S	SEWERAGE
	PUBLIC PURPOSES DENOTED AS FOLLOWS:
SES	STATE EMERGENCY SERVICE
SJ	ST. JOHN AMBULANCE
T	TELECOM
TA	TAFE
U	UNIVERSITY
WS	WATER SUPPLY

ZONES	
	RESIDENTIAL
	DEVELOPMENT
	LOCAL CENTRE
	MIXED USE
	PORT
	SETTLEMENT
	TOURIST
	TOWN CENTRE - CHINATOWN
	SPECIAL USE
	SPECIAL USE DENOTED AS FOLLOWS:
AAU	AIRPORT AND AVIATION USES
AU	ABORIGINAL USE
AUO	ABORIGINAL USE AND OFFICE
BO	BIRD OBSERVATORY
CF	CROCODILE FARM
CP	CARAVAN PARK AND CAMPING
	SPECIAL USE DENOTED AS FOLLOWS:
H	HOTEL
H/M	HOTEL/MOTEL
M	MOTEL
O	OFFICE
O/R	OFFICE/RESIDENTIAL
PF	PEARL FARM
R	RESIDENTIAL
TD	TOURIST DEVELOPMENT
V	VARIOUS
	INDUSTRY
	LIGHT & SERVICE INDUSTRY
	WATERBANK CONSERVATION & DEVELOPMENT
	GENERAL RURAL
	RURAL AGRICULTURE
	RURAL LIVING