



The value of the red meat industry to Australia

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Foreword

The Australian red meat industry serves both domestic and an ever increasing export demand. Although total production and employment in the industry are relatively small, it is still a significant contributor to the economies of specific Australian regions, including south-western Western Australia for sheep and central Queensland for cattle.

ABARE was commissioned by the Agricultural Productivity Division of the Australian Government Department of Agriculture, Fisheries and Forestry to assess trends in and contribution of the red meat industry to the Australian economy and analyse the key factors affecting the industry's competitiveness.

This report contains an analysis of the trends in red meat production in Australia and examines the economic contribution of the industry to the total value of agricultural production and exports. The report also analyses the economic importance of the industry to selected regional economies and presents an overview of the factors affecting the red meat industry. These include drought, domestic and foreign demand, exchange rate fluctuations and barriers to trade.



Phillip Glyde
Executive Director
June 2009

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Summary

Red meat industry in Australia

The Australian red meat and livestock industry encompasses the production and processing of beef cattle, sheep, goats and buffalo, for export and domestic consumption. This report covers the beef and sheep meat industries in Australia.

Australia is among the world's largest producers of red meat and is the second largest exporter of beef and sheep meat. Australia is also a large exporter of live animals.

Australian meat production has been increasing over time, while domestic consumption (per person) of red meat has fallen. This has led to a greater reliance on export markets. As a result, the Australian red meat industry is becoming increasingly focused on servicing export market requirements.

Economic contribution of the red meat industry

Red meat production and live exports of sheep and cattle accounted for nearly 22 per cent of the total gross value of Australian agricultural production in 2007-08. Though it is variable, the trend over time suggests an increasing contribution of sheep and cattle toward the total value of agricultural production, particularly over the past 10 years.

The red meat industry (including live exports) also accounts for a significant proportion of the value of agricultural exports, contributing 22 per cent to the value of Australian farm exports in 2007-08.

The red meat processing industry is an important market for products from other sectors, including live animals, transport services, the container industry and the detergent industry. In addition to meat products, the red meat industry also produces by-products including hides, skins, oils and fats, that are used as inputs into other industries. As a result, growth of the red meat industry contributes to growth in other economic activities.

The red meat industry in selected regional economies

The economic importance of the red meat industry is more significant at the regional level where farming, particularly livestock production, comprises a large proportion of total economic activity. To illustrate this, production activities within the red meat industry were identified and a region for each was selected. The economic importance of the red meat industry for each of these regions is discussed in more detail in the report.

A lamb producing region in New South Wales, a live sheep exporting region in Western Australia, a beef producing region in Queensland and a red meat processing region in South Australia were identified. In the beef producing region in Queensland, beef cattle and sheep farming, and meat processing contributed around 8 per cent to total regional employment in 2005-06. In the red meat processing region, the red meat sector contributed 13 per cent to total regional employment. Nationally, the red meat sector accounts for up to 1.6 per cent of total employment.

Factors affecting the industry

Drought can influence feed prices, slaughter rates, the demand for sheep and cattle for restocking, and saleyard prices. Poor seasonal conditions generally lead to a reduction in pasture availability, an increase in feed costs and higher slaughterings, and a decline in herd and flock numbers.

Domestic demand for red meat is another factor that can affect the industry. In Australia, there has been an increase in the demand for poultry and pig meat as they are substituted for red meat, partly reflecting changes in relative prices.

Foreign meat demand continues to be important for the industry. Although Australia's major markets, particularly for beef, are mainly in developed countries, developing country markets are becoming more important as incomes and populations in these markets increase.

Exchange rate fluctuations influence the red meat sector because a large proportion of Australia's red meat is exported. A stronger Australian dollar translates into relatively more expensive Australian exports in other countries, reducing the quantity of Australian meat demanded in those markets.

In the global market there are barriers to trade in beef and sheep meat that affect Australia's red meat industry. Such barriers, for example, include country specific EU import quotas on sheep meat and beef, and the Japanese tariff on imported beef.

1 Introduction

The red meat industry is an important component of Australian agriculture. It contributes significantly to the value of agricultural production and exports, and provides employment for a sizable proportion of workers in rural and regional areas. By buying farm inputs and supplying products, the red meat sector also stimulates other industries, both upstream and downstream.

The geographical distribution of the cattle and sheep populations within Australia indicates the regional importance of the red meat industry. Nearly 70 per cent of the national beef cattle herd of 24.8 million head is located in regional areas of Queensland and New South Wales, and the majority of Australia's 76.9 million sheep are located in regional areas of New South Wales, Western Australia and Victoria.

The contribution of the cattle and sheep industries to agricultural production has varied over time, reaching 29 per cent of the value of agricultural production in 2006-07 when crops were adversely affected by drought, then falling to around 22 per cent in 2007-08 as the value of crop production recovered.

The cattle and sheep industries are subject to a number of factors, both domestic and foreign, affecting production which in turn affects Australia's regional economies where the cattle and sheep industries are located. Over the past 10 years, the industry has become increasingly reliant on the export market as production has risen and domestic consumption per person declined.

The objective of this research is to assess the economic contributions of the red meat industry to Australia and create a database for an analytical framework for the analysis of factors affecting the red meat industry. A detailed assessment of the contribution of the industry and an analysis of the factors affecting it will improve understanding of the red meat sector's importance to the Australian economy, particularly to regional communities, and may assist in the design of policy measures affecting the industry and regional economies.

An overview of the red meat industry in Australia is provided in chapter 2, while its economic contribution is discussed in chapter 3. The role of the industry in regional economies is examined in chapter 4. The factors affecting the red meat industry are explored in chapter 5, and some concluding remarks are contained in chapter 6.

2 Red meat industry in Australia

The Australian red meat and livestock industry encompasses the production and processing of beef and dairy cattle, sheep, goats and buffalo, for export and domestic consumption, with beef cattle and sheep the dominant industries. This report covers the beef and sheep meat industries in Australia.

Australia is among the world's largest producers of red meat, with 2.15 million tonnes (carcass weight) of beef and veal, 435 000 tonnes of lamb and 258 000 tonnes of mutton produced in 2007-08. In 2007-08, the gross value of beef and veal produced was more than \$7.4 billion, and for sheep meat it was around \$2.2 billion.

Australia is the world's second largest exporter of beef and sheep meat. In 2007-08, around 64 per cent of beef produced in Australia was exported, 45 per cent of lamb and 82 per cent of mutton. The combined value of beef, lamb and mutton exports in 2007-08 was slightly more than \$5.4 billion.

Australia is also a large exporter of live animals, particularly out of northern and western Australia. In 2007-08, more than 700 000 cattle, valued at around \$450 million, were exported mainly to markets in South-East Asia. More than 4 million sheep were also exported in 2007-08, mostly to the Middle East, with a value of around \$280 million.

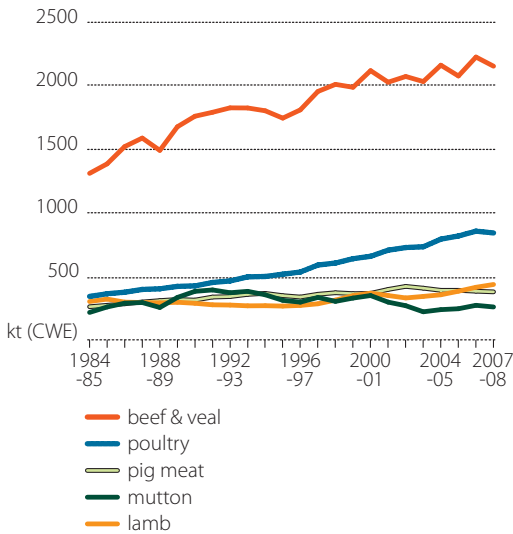
The distribution of cattle and sheep within Australia provides a strong indication of the regional importance of the industries. Around 47 per cent of the national beef cattle herd of 24.8 million head (as at June 2008) is located in Queensland and around 22 per cent of the herd is in New South Wales. The majority of Australia's 76.9 million sheep (as at June 2008) are located in New South Wales (34 per cent), Western Australia (23 per cent) and Victoria (22 per cent).

Trends over time

Australian meat production has been increasing over time (figure a). From 1984-85 to 2007-08, beef production increased by around 65 per cent and lamb production by 44 per cent. Over the same period the production of poultry and pig meat also increased.

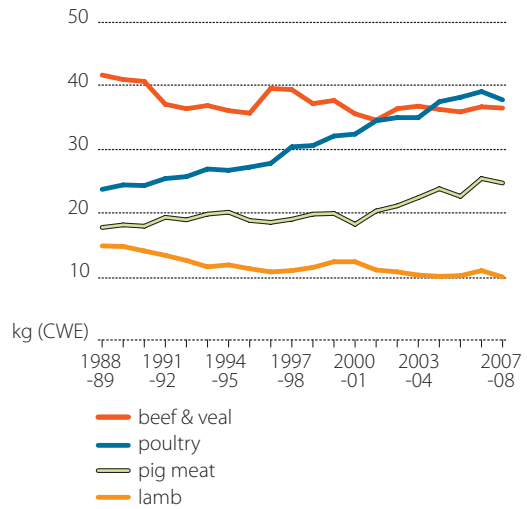
In contrast to production, domestic consumption (per person) of red meat has fallen over the past 20 years (figure b). Beef consumption has been quite variable, but has shown an overall downward trend, falling from 42 kilograms a person in 1988-89 to 37 kilograms a person in 2007-08. Consumption of lamb has also fallen over the same period from 15 kilograms to 10 kilograms a person.

a Australian meat production



Note: CWE is carcass weight equivalent.
Source: ABS 2008a.

b Australian meat consumption per person



Note: CWE is carcass weight equivalent.
Source: ABARE 2008a.

However, the quantity of total meat consumed per person has not changed significantly over time. While the consumption of beef and lamb has declined, the consumption of poultry and pig meat has continued to increase, reflecting changes in relative prices and also changing tastes and preferences.

The increase in the production of red meat in Australia and decline in domestic consumption has led to a greater reliance on export markets. In the late 1980s, less than 60 per cent of beef was exported; this had increased to 64 per cent by 2007-08. For lamb, less than 15 per cent was exported in 1988-89, but by 2007-08 this had increased to 45 per cent. This greater dependence on export markets means the Australian red meat industry is increasingly influenced by global factors.

1 Australian meat exports - by volume

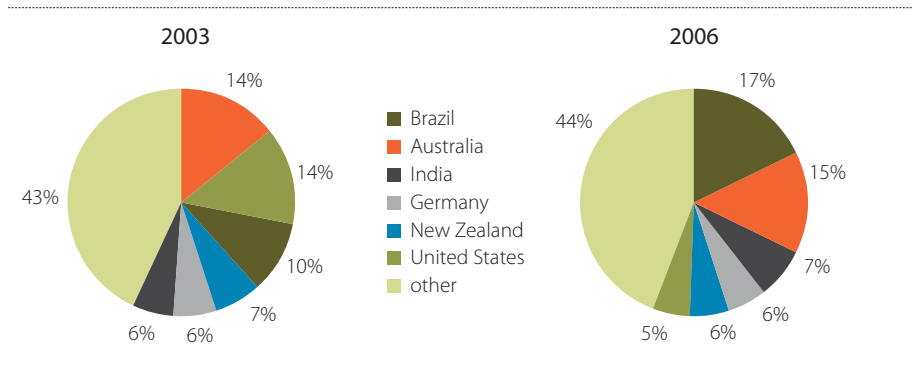
		1999	2000	2001	2002	2003	2004	2005	2006	2007
		-2000	-01	-02	-03	-04	-05	-06	-07	-08
Beef and veal ^a	kt	852	959	902	902	860	948	892	974	930
Lamb ^a	kt	99	115	109	98	112	123	143	150	163
Mutton ^a	kt	171	180	159	152	120	137	145	162	158
Live cattle	'000	846	846	797	977	581	574	549	638	714
Live sheep	'000	4 859	5 936	6 443	5 843	3 843	3 233	4 248	4 138	4 069

^a Shipped weight.
Sources: DAFF 2008 and ABS 2008a.

Australia compared with other countries

In 2006, Australia was the second largest exporter of beef and veal, after Brazil, accounting for around 15 per cent of world beef exports. Prior to 2005, Australia was the largest exporter of beef (figure c).

C Largest beef exporters



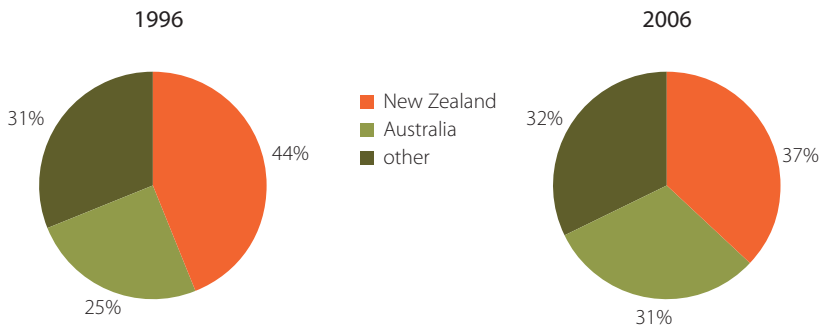
Source: UN Comtrade 2008.

World beef trade has been constrained over the past few years by disease-related trade restrictions. The discovery of bovine spongiform encephalopathy (BSE) in the United States in December 2003 led to bans, and more recently restrictions, on imports of US beef by Japan and the Republic of Korea. As a result, beef exports from the United States fell in 2004 and have since remained low.

As a result of restrictions on US beef exports to Japan and the Republic of Korea, the demand for Australian beef increased in those markets. Reflecting this, as well as increased production, total Australian beef exports have increased. However, beef exports from Brazil increased by more and by 2006 Brazil was the world's largest beef exporter.

Australia is also a large exporter of sheep meat, second only to New Zealand in world trade (figure d). Although New Zealand has remained dominant, the proportion of world exports coming from Australia increased from 25 per cent to 31 per cent over the 10 years to 2006.

d Largest sheep meat exporters

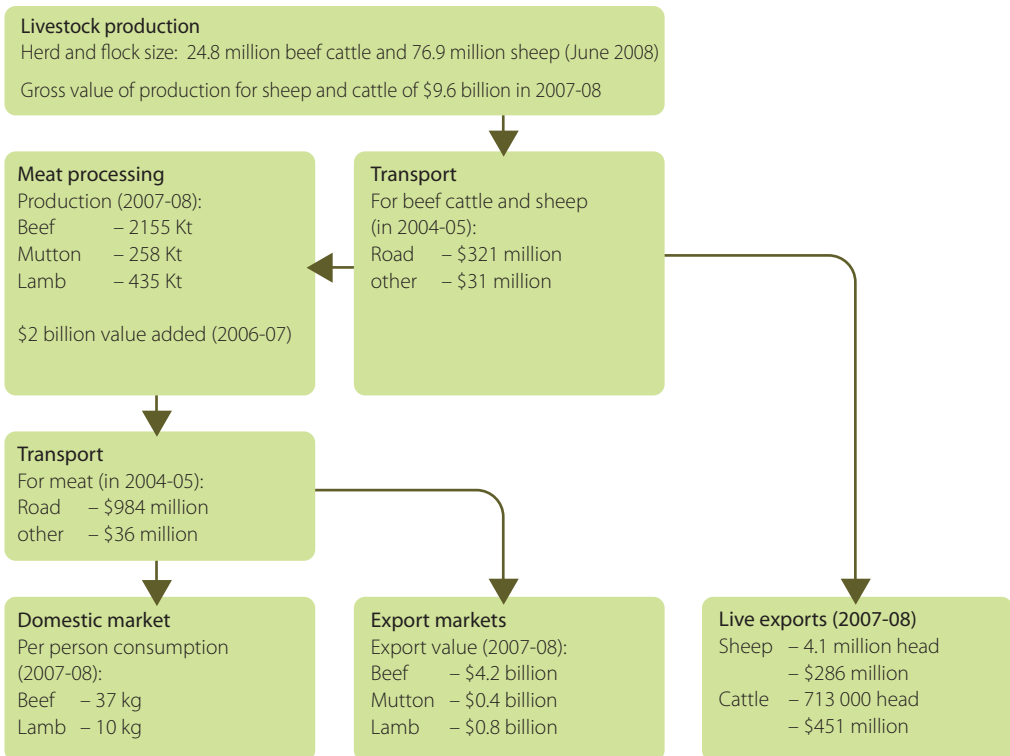


Source: UN Comtrade 2008.

Profile of the red meat industry

The supply chain for red meat (figure e) extends from livestock production at the farm to retail marketing of the various cuts of meat and co-products.

e Red meat production chain



Size and location

Livestock production is located in most regional areas of Australia, with abattoirs, wholesalers and retailers also located in many regions.

As at June 2008, it is estimated that there were 41 640 specialised beef cattle farming establishments and 11 148 specialised sheep farming establishments (this number also includes wool producers). There were an additional 7226 establishments in sheep and beef cattle farming and around 13 000 establishments in either grain-sheep or grain-beef cattle farming (table 2).

2 Establishments with agricultural activity – by state ^a

	NSW	Vic	Qld	SA	WA	Aust
Sheep farming (specialised)	4 068	3 549	362	1 362	1 316	11 148
Beef cattle farming (specialised)	14 066	8 719	13 506	1 429	2 468	41 640
Sheep-beef cattle farming	3 635	1 651	487	816	351	7 226
Grain-sheep or grain-beef cattle farming	5 154	2 511	1 332	1 864	2 023	13 059

^a Year ended 30 June 2008 and for establishments with estimated value of agricultural operations (EVAO) greater than \$5000.
Source: ABS 2008d.

Livestock producers are located across many regional areas of Australia (maps 1 and 2). Specialised beef cattle producers are located mainly in New South Wales (34 per cent), Queensland (32 per cent) and Victoria (21 per cent). The majority of feedlots are located in Queensland and New South Wales.

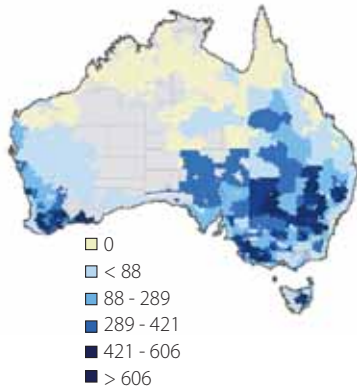
It should be noted that these numbers include all establishments with an estimated value of agricultural operations (EVAO) of more than \$5000 (ABS 2008d). For the larger establishments – those with an EVAO of greater than \$22 500 – 26 678 were specialised beef farms and 8117 were specialised sheep farms (table 3).

3 Establishments with agricultural activity – by EVAO ^a

EVAO (\$'000)	sheep farming (specialised)	beef cattle farming (specialised)	sheep-beef cattle farming	grain-sheep or grain-beef cattle farming
<22.5	3 031	14 962	1 080	1 151
22.5 < 40	1 700	7 178	636	1 178
40 < 50	468	2 509	534	609
50 < 100	2 148	6 787	1 440	2 360
100 < 150	1 172	2 651	1 121	1 962
150 < 200	859	1 985	647	1 261
200 < 350	976	2 243	917	2 418
350 < 500	492	1 077	412	853
500 < 1000	231	1 300	348	995
1000 < 2000	63	613	82	225
2000 and above	7	336	10	46

^a Year ended 30 June 2008 and for establishments with estimated value of agricultural operations (EVAO) greater than \$5000.
Source: ABS 2008d.

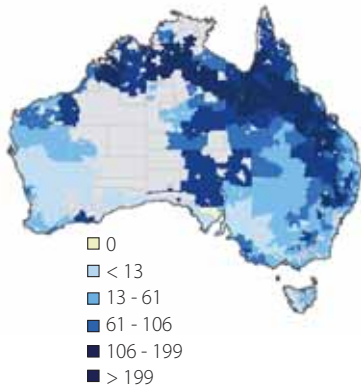
map 1 Location of sheep in Australia - as at 30 June 2006



Meat processors are also located across much of Australia except the Northern Territory. The top 25 processors in Australia owned 51 abattoirs and accounted for 77 per cent of Australia's red meat production in 2006. Of the 49 abattoirs that had their locations listed, 14 were in Queensland, 12 in New South Wales, 11 in Victoria and the remainder in South Australia, Tasmania and Western Australia. However, these abattoirs are of varying sizes and capacities.

In 2006-07, an average of 2.9 people out of every 1000 worked in meat processing. This varies by state (table 4) and region and is dependent on the size and location of meat processing plants, and the number of people employed at each. Of all the states, Queensland has the most people (in absolute terms and as a proportion of the labour force) employed in meat processing.

map 2 Location of beef cattle in Australia - as at 30 June 2006



More than 31 000 people across Australia were employed in the meat processing sector in 2006-07, with wages and salaries worth more than \$1.4 billion (ABS 2008c). Operations within the meat processing sector are mainly engaged in the following:

- slaughtering animals
- boning, freezing, preserving or packing meat
- canning meat
- manufacturing meats from abattoir by-products
- rendering lard or tallow.

4 Employment in meat processing - by state in 2006-07

state	meat processing	all industry	%
New South Wales	7 307	3 356 494	0.22
Victoria	4 649	2 614 113	0.18
Queensland	11 752	2 165 142	0.54
South Australia	2 780	765 279	0.36
Western Australia	2 596	1 112 233	0.23
Tasmania	252	226 040	0.11
Australia a	31 026	10 542 819	0.29

a Includes Northern Territory and the Australian Capital Territory.

Sources: ABS 2008c; ABS 2009a.

3 Economic contribution of the red meat industry

Value of red meat production

Red meat production and live exports of sheep and cattle accounted for nearly 22 per cent of the total gross value of Australian agricultural production in 2007-08. The contribution of red meat varies by state, ranging from 76 per cent in the Northern Territory (all from cattle) to 11 per cent in South Australia, where the value of sheep and lambs is the largest contributor.

5 Gross value of production - year ended 30 June 2008

	cattle and calves \$m	sheep and lambs \$m	total red meat \$m	total agriculture \$m	contribution of red meat to agriculture %
New South Wales	1 590	442	2 032	9 009	22.6
Victoria	1 232	869	2 101	11 778	17.8
Queensland	3 388	57	3 445	9 785	35.2
South Australia	252	347	600	5 248	11.4
Western Australia	488	410	897	7 199	12.5
Tasmania	160	42	201	1 118	18.0
Northern Territory	323	0	323	427	75.6
Australian Capital Territory	4	1	6	18	30.8
Australia	7 436	2 168	9 605	44 581	21.5

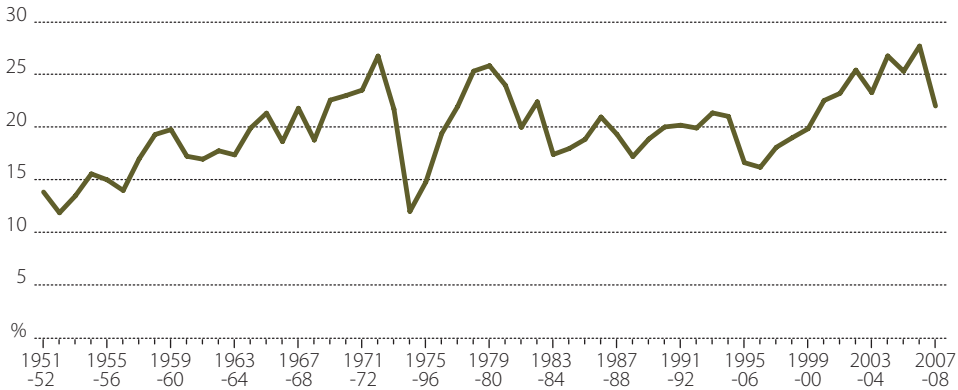
Source: ABS 2009b.

The contribution of cattle and sheep (both slaughtered and exported live) to the total value of Australian agricultural production has varied over time (figure f). Over the past 50 years the contribution has ranged from 12 per cent to 29 per cent. The trend over time suggests an increasing contribution of sheep and cattle toward the total value of agricultural production, particularly over the past 10 years.

Beyond the farm level, the red meat industry also contributes to the Australian economy. In 2006-07, the value added for meat processing in Australia was \$1973 million.

In addition to meat, there is value derived from co-products. These include offal, tallow, hides and skins, meat meal and other rendered products. Co-products account for approximately 11 per cent of the value of a slaughtered animal (MLA 2009).

f Contribution of cattle and sheep to the value of agricultural production



Sources: ABS 2008e, 2009b.

Export share

The value of red meat exports in 2007-08 exceeded \$5.4 billion, with the value of live cattle and sheep contributing an additional \$730 million to exports. Combined, the red meat industry and live exports contributed 22 per cent to the value of Australian farm exports in 2007-08.

Employment

The red meat industry is a substantial employer, with many people involved in the production of red meat in Australia, from livestock production to retail and marketing of the final product.

The red meat sector, from livestock farming to selling products at the retail level, employs up to 160 000 people across Australia (table 6). There are also many more people employed in industries that provide services and products, such as transport, machinery and feed, to the red meat industry.

6 Number of people employed in 2006 - by industry

Beef cattle farming (specialised)	48 175
Beef cattle feedlots (specialised)	570
Sheep farming (specialised)	20 714
Sheep-beef cattle farming	13 316
Grain-sheep or grain-beef cattle farming	31 486
Sheep, beef cattle and grain farming, nfd	867
Meat processing	24 456
Meat and meat product manufacturing, nfd	329
Cured meat and smallgoods manufacturing	6 317
Meat, poultry and smallgoods wholesaling	12 089
Fresh meat, fish and poultry retailing	22 925

nfd Not further defined.

Source: ABS 2007.

Contribution to other industries

The red meat industry stimulates expansion of other activities including agricultural, manufacturing and services activities. This is through the use of products and services from these industries to produce and process live animals into beef, mutton and lamb. The extent of these contributions can be examined through the use of an input-output table. An input-output table illustrates the flow of goods and services among all sectors in an economy. The latest input-output table for the Australian economy, published by the Australian Bureau of Statistics (ABS), estimates the value of these flows for 2004-05. To allow a simplified and more accurate account of the links of the red meat industry with other industries, the analysis focuses on the meat processing aspect of the red meat sector.

The linkages of the red meat industry with other economic activities are represented in the input-output table as purchases by the red meat industry of inputs when producing meat products and as sales of meat products, including co-products and by-products, to industry users.

The red meat industry is a buyer of inputs

In the input-output table there are 109 sectors, with the processing of pigs, poultry, sheep and cattle all grouped into one meat processing sector (appendix A). The value share of cattle and sheep sold to the meat processing industry in 2004-05 was about 83 per cent.

The red meat processing industry is an important buyer of products from other sectors, including the agricultural, manufacturing and services sectors (table 7). In 2004-05, 71 per cent of the total value of sales of cattle (valued at \$6293 million in 2004-05 dollars) was sales to the meat industry. The transport services sector, the container industry and detergent industry also sell products to the meat industry. A total of \$13 billion worth of products and services were used by the meat processing industry during the period. Of this, about 69 per cent was in the form of animals purchased for slaughter.

7 Share of meat processing industry in total product sales

industries a	meat processing industry share to total product sales (%)	value of purchases (2004-05 million \$A)
Beef cattle	70.7	6 293
Pigs	58.8	503
Poultry	56.8	1 033
Sheep	28.6	1 202
Paper containers and products	3	165
Road transport	2.9	984
Soaps and detergents	1.4	24
Total		13 048

a See appendix A for industry descriptions.

Source: ABS 2008b.

The sheep industry is less reliant on the meat processing industry with only 29 per cent of total sales in 2004-05 going to the processing industry.

The red meat industry supplies inputs

In addition to meat products, the red meat industry produces co-products and by-products such as hides and skins and oils and fats. These products are used as inputs into other industries. The cost shares of red meat products in the total intermediate input cost of other industries are shown in table 8.

8 Cost share of red meat, co-products and by-products – selected industries

industry a	cost share (%)
Bakery	10.83
Leather and leather products	10.37
Accommodation, cafes and restaurants	8.29
Soaps and detergents	7.23
Meat and meat products	6.48
Retail trade	5.38
Oils and fats	5.2
Other food products	3.67

a See appendix A for industry descriptions.
Source: ABS 2008b.

The share of red meat industry products is highest in the bakery industry, accounting for an estimated 11 per cent of the total intermediate input cost. The cost share of red meat industry products is also high in leather manufacturing and in the soap and detergent industries. The oil and fat manufacturing industry is also dependent on the meat processing industry for rendered lard or tallow, with 5 per cent of its intermediate input cost being payments to the meat processing industry.

The red meat industry also plays an important role in the services industry such as retail trade and accommodation, cafes and restaurants. In the case of the accommodation, cafes and restaurants industry, purchases from the red meat industry represent 8 per cent of the industry's expenditure on goods and services.

The accommodation, cafes and restaurants industry accounted for 32 per cent of total meat sales in 2004-05 (table 9), followed by the retail trade industry. Together, the two industries accounted for 64 per cent of the value of meat products used by other industries as intermediate inputs. Not surprisingly, the meat industry is affected by changes in accommodation and restaurant activities and retail trade.

9 Industries important to meat processing

industries ^a	share of industries to total meat sales (%)
Accommodation, cafes and restaurants	32.33
Retail trade	31.91
Meat and meat products	12.96
Other food products	3.91
Wholesale trade	3.53

^a See appendix A for industry descriptions.

Source: ABS 2008b.

4 The red meat industry in selected regional economies

The economic importance of the red meat industry is more significant at the regional level where farming, particularly livestock production, comprises a large proportion of total economic activity. To illustrate this, four production activities within the red meat industry were identified and a region for each was selected. These were a lamb producing region, a live sheep exporting region, a beef producing region and a red meat processing region.

The identification of livestock regions makes use of the Australian Bureau of Statistics' (ABS) 2005-06 Agricultural Census (2008f) and 2006 Census of Population and Housing (2007), where employment and values of agricultural production including livestock production are available at the Statistical Local Area (SLA) level. As livestock production activities could vary and change in concentration over time, because of a number of factors including drought, the use of the latest statistical information at the SLA level allows an accurate representation of areas where red meat production is a major activity. Details of region selection are discussed in appendix C.

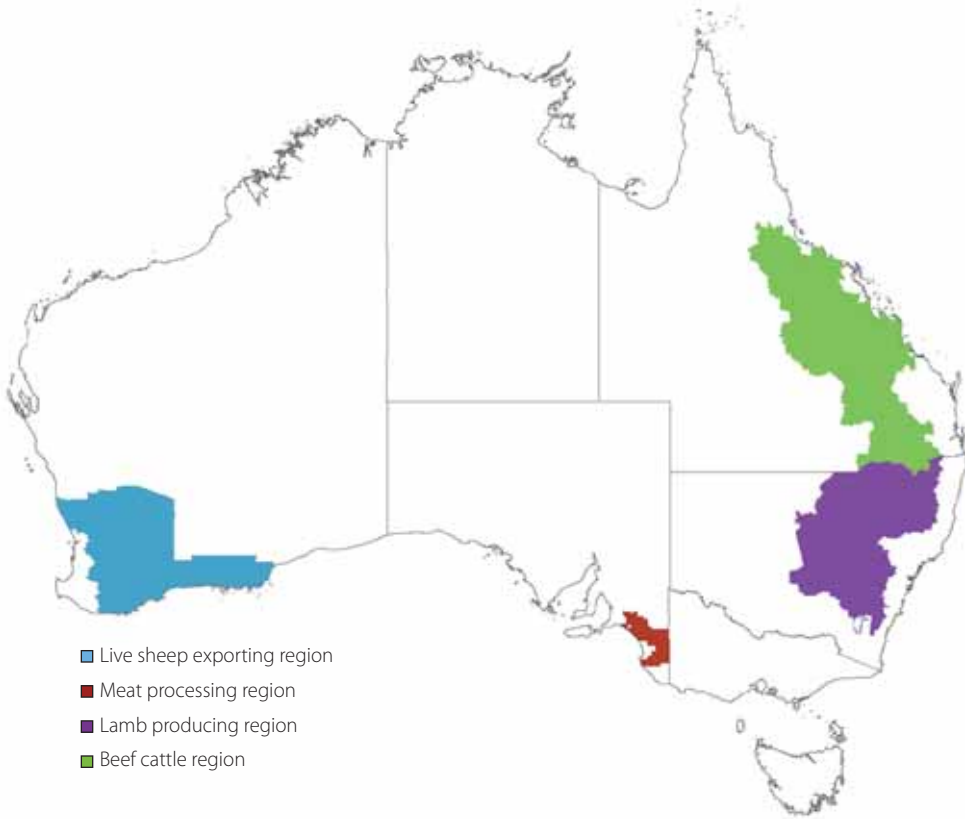
From a range of possible regions that could potentially represent the selected red meat production activities, the final regions selected were a region in Western Australia for live sheep exporting, a region in New South Wales for lamb production, a region in Queensland for beef production and a region in South Australia for meat processing (map 3).

Western Australian live sheep exporting region

For the purpose of this analysis, a Western Australian sheep producing area was formed, encompassing most of the Western Australian wheat sheep zone. It was treated as a live export focused region since Western Australia accounts for a large majority of Australia's live sheep exports. Fremantle Port, in the vicinity of the region, accounted for 75 per cent of Australia's live sheep exports during 2008.

During 2006, sheep farming in this region employed 1955 people, or 3.1 per cent of the region's employed labour force. This region accounted for 66.6 per cent of all workers employed in sheep farming in Western Australia, totalling 2936. The value of sheep and lamb slaughterings in this region also accounted for a large majority of Western Australia's total value of sheep and lamb slaughterings. During 2005-06 the region's value of sheep and lamb slaughterings was \$383 million. Although the sheep industry represented only 10.5 per cent of the region's total agricultural production value, as a proportion of Western Australia's sheep and lamb slaughtering value, the region accounted for 81.7 per cent.

map 3 Australian red meat regions



10 Contribution of WA sheep producing region

	sheep and lamb slaughtering ^a		sheep farming employment ^b		other red meat employment ^{bc}		total red meat employment ^b	
	value \$m	share %	number	share %	number	share %	number	share %
Region	383	10.5	1 955	3.1	1 620	2.6	3 575	5.7
Western Australia	469	8.1	2 936	0.3	4 818	0.5	7 754	0.8
Australia	2 112	5.5	20 630	0.2	73 219	0.8	93 849	1.0
Proportion of region to WA		81.7		66.6		33.6		46.1
Proportion of region to Australia		18.2		9.5		2.2		3.8

^a 2005-06. ^b 2006. ^c Beef cattle specialist and meat processing employment.
Sources: ABS 2007, 2008f.

New South Wales lamb producing region

A New South Wales lamb producing area which incorporates the Northern and Southern Highlands was selected. This region, employing 4354 people in sheep farming, accounted for 56.3 per cent of New South Wales' sheep farming workers, but only 2.2 per cent of total workers in the region during 2006.

The production value of sheep and lamb slaughterings in the region was \$257 million during 2005-06, accounting for 54 per cent of the value of slaughterings in New South Wales. Sheep and lamb slaughtering contributed 6.9 per cent of the total value of agricultural production.

11 Contribution of NSW lamb producing region

	sheep and lamb slaughtering ^a		sheep farming employment ^b		other red meat employment ^{bc}		total red meat employment ^b	
	value \$m	share %	number	share %	number	share %	number	share %
Region	257	6.9	4 354	2.2	7 899	4.0	12 253	6.2
New South Wales	476	5.3	7 734	0.3	20 635	0.7	28 369	1.0
Australia	2 112	5.5	20 630	0.2	73 219	0.8	93 849	1.0
Proportion of region to NSW		54.0		56.3		38.3		43.2
Proportion of region to Australia		12.2		21.1		10.8		13.1

^a 2005-06. ^b 2006. ^c Beef cattle specialist and meat processing employment.
Sources: ABS 2007, 2008f.

Queensland beef cattle region

The beef cattle region was selected to be in Queensland, extending from Townsville to Stanthorpe. In this region, 8423 of the total 144 841 workers, or 5.8 per cent of the labour force, were employed in beef cattle farming. Of the total number of workers employed in beef cattle farming in Queensland, this region accounted for 46.6 per cent.

The region's value of cattle and calf slaughterings during 2005-06 was estimated to be more than \$2.02 billion. This contributed a significant 52 per cent to the region's agricultural production value, and accounted for 56 per cent of Queensland's total value of cattle and calf slaughterings.

12 Contribution of QLD cattle producing region

	cattle and calf slaughtering ^a		beef cattle employment ^b		other red meat employment ^{bc}		total red meat employment ^b	
	value \$m	share %	number	share %	number	share %	number	share %
Region	2 021	51.9	8 423	5.8	2 768	1.9	11 191	7.7
Queensland	3 607	41.4	18 060	1.0	10 265	0.6	28 325	1.6
Australia	7 685	19.9	48 626	0.5	45 223	0.5	93 849	1.0
Proportion of region to QLD		56.0		46.6		27.0		39.5
Proportion of region to Australia		26.3		17.3		6.1		11.9

^a 2005-06. ^b 2006. ^c Sheep specialist farming and meat processing employment.

Sources: ABS 2007, 2008f.

Northern Australia live cattle exporting region

Exports of live cattle are an important segment of Australia's cattle market, significantly adding to the total value of exports. More than 6 per cent of Australia's total value of cattle production in 2007-08 was accounted for by live cattle exports. Australia exported 713 000 cattle, valued at close to \$451 million, during that year.

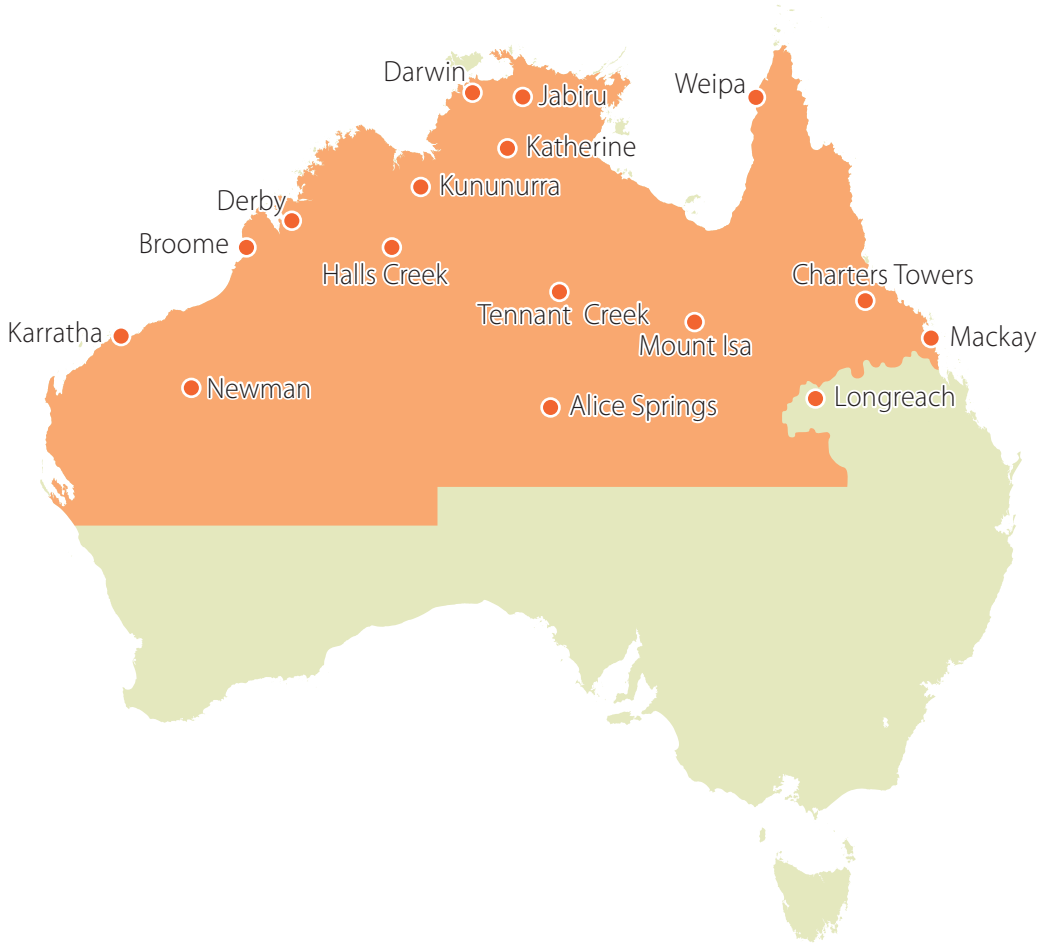
In recent years, more than 80 per cent of total live cattle exports, including most slaughter and feeder cattle, have been sourced from northern Australia (map 4) (Drum and Gunning-Trant 2008). Many regions in the Northern Territory and northern parts of Western Australia and Queensland are significantly reliant on the live cattle exporting industry.

South Australia meat processing region

South-eastern South Australia was selected to represent a meat processing area. During 2006, 6.3 per cent of workers in this region were employed in meat processing, compared with 0.3 per cent nationally and 0.3 per cent in South Australia. Meat processing, and beef cattle and sheep farming employment contributed 13 per cent to total employment in this region. Statistics on the value of meat processing are unavailable because of confidentiality issues.

Meat processing is a relatively large employer in a number of other regions, including Rockhampton/Fitzroy, Toowoomba/Darling Downs and Western Brisbane in Queensland, and north-eastern NSW, including the Northern Tablelands. Meat processing employment data for these regions are in table 14.

map 4 Northern Australia cattle region



Source: Drum and Gunning-Trant 2008.

13 Contribution of SA meat processing region

	meat processing employment ^a		other red meat employment ^{ab}		total red meat employment ^a	
	number	share %	number	share %	number	share %
Region	1 164	6.3	1 183	6.4	2 347	12.8
South Australia	2 101	0.3	4 602	0.7	6 703	1.0
Australia	24 593	0.3	69 256	0.8	93 849	1.0
Proportion of region to SA		55.4		25.7		35.0
Proportion of region to Australia		4.73		1.71		2.50

^a 2005-06. ^b Beef cattle specialist and sheep farming employment.

Source: ABS 2007.

14 Selected regions most reliant on meat processing

region	meat processing employment	all industry employment	proportion
North-eastern NSW	976	24 800	3.94
South-east SA	1 164	18 363	6.34
Rockhampton QLD	1 179	50 821	2.32
Toowoomba QLD	1 154	36 659	3.15
Western Brisbane QLD	1 405	57 319	2.45
Total	5 878	187 962	3.13

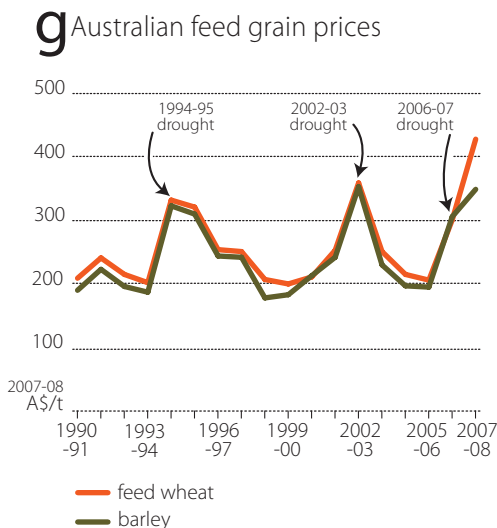
Source: ABS 2007.

5 Factors affecting the industry

With the red meat industry in Australia heavily export oriented, there are a range of factors which affect the industry. These include seasonal conditions, domestic and foreign demand, exchange rates, welfare issues and barriers to trade. Another factor that may affect the industry in the future is the Carbon Pollution Reduction Scheme aimed at reducing greenhouse gas emissions in Australia. The scheme is yet to be agreed in Parliament.

Drought

Drought can influence feed prices, the supply of meat, the demand for sheep and cattle for restocking, and saleyard prices. Poor seasonal conditions generally lead to a reduction in pasture availability and an increase in feed grain and fodder costs. These factors influence producers' decisions about stocking rates, matings and livestock sales and purchases.



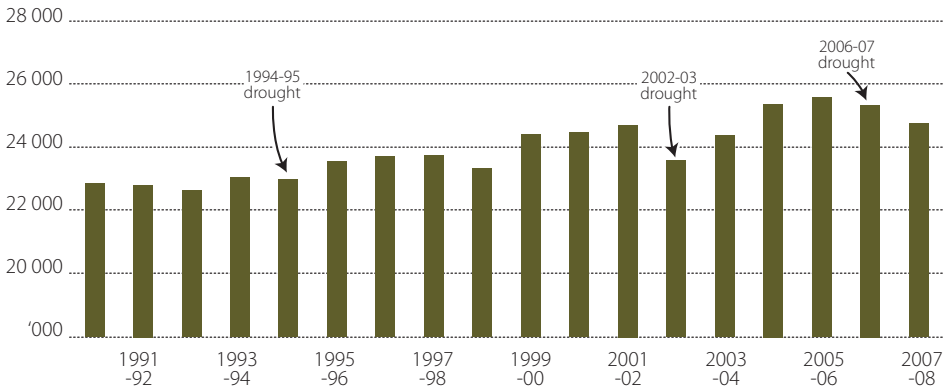
Source: The Land 2008.

Since 1990-91, there have been at least three years with widespread drought across Australia. In each of these years feed grain prices increased significantly (figure g).

In times of drought, as pasture quality deteriorates and the need for supplementary feeding increases, producers tend to reduce stock numbers. Consequently, beef cattle numbers, which have been increasing over the past 30 years, tend to decline in drought years (figure h). This has been less obvious in sheep numbers, with the national sheep flock reducing steadily since 1990, largely as a result of lower returns from wool relative to competing on-farm enterprises such as grain cropping.

Usually in the year following a drought, slaughterings decline as producers retain cows and heifers to begin rebuilding herds, and retain breeding ewes to rebuild flocks. Slaughterings of cattle and sheep declined after each of the four major droughts over the past 30 years (figure i).

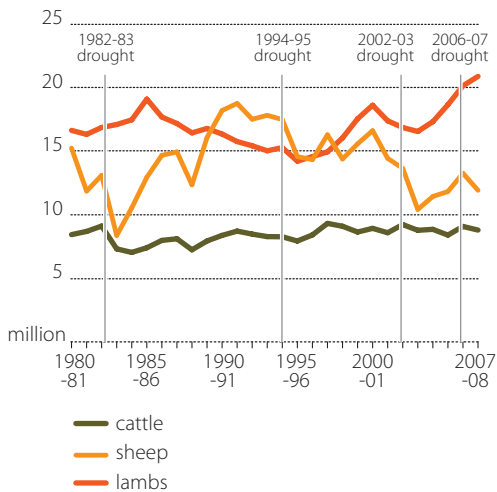
h Australian beef cattle herd



Source: ABS 2008d.

Domestic demand

i Total yearly slaughtering



Source: ABS 2008a.

In Australia there has been an increase in the demand for poultry and pig meat and some shift away from red meat consumption. This is partly because of the changes in the relative prices of the different meats. The prices of lamb and beef have increased since the late 1990s, relative to the prices of poultry and pig meat. There may also have been some change in consumer tastes and preferences over the period.

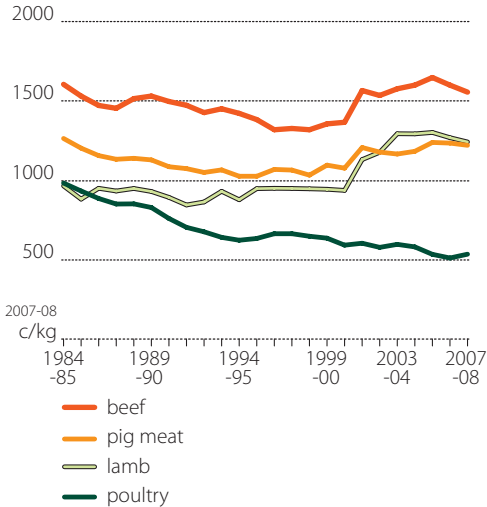
Despite the decline in domestic demand for red meat, beef and lamb consumption in Australia remains high compared with consumption in many other countries.

Over the past 30 years there have been many studies estimating meat demand in Australia. Even though most of these studies were done more than 15 years ago, the results still provide

some useful information. The results from such studies suggest that the sensitivity of both beef and lamb demand to price changes have been declining over time in Australia (Griffith et al. 2001).

It is worth noting that the results do depend on the model chosen and vary considerably between studies. However, results from one of the more recent studies (Piggot et al. 1996) suggested that a 1 per cent increase in the retail price of beef led to a 0.4 per cent fall in the quantity of beef demanded. Most studies suggest that the demand for lamb is more

j Australian retail prices for red meat



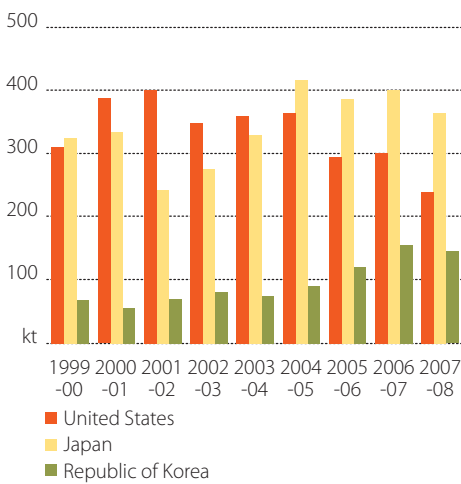
Sources: ABS 2009c and ABARE estimate.

sensitive to changes in prices, with Piggot et al. suggesting that a 1 per cent increase in the retail price leads to an average 1.26 per cent decline in the quantity of lamb demanded.

Foreign demand

Growth in meat demand is largely driven by income and population growth. Reflecting this, there is increasing demand for meat in developing countries where income and population growth rates are higher than in developed countries. Meat demand in developed countries has been quite stable (Agriculture and Agri-Food Canada 2006). While Australia's major markets, particularly for beef, are mainly developed countries, developing country markets are becoming more important as export volumes increase.

k Australian beef exports to major markets ^a



^a Shipped weight.
Source: DAFF 2008.

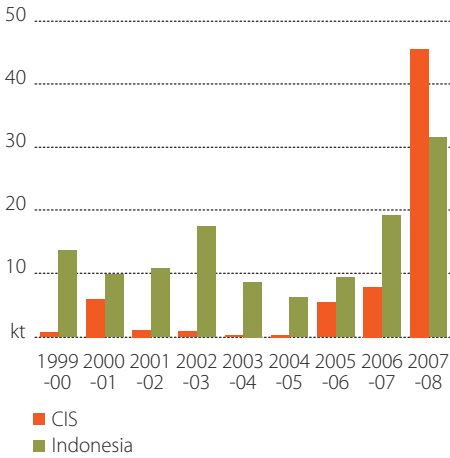
Major markets for Australian beef are Japan, the Republic of Korea and the United States. Exports of Australian beef to north Asian markets increased following the discovery of BSE in the United States in December 2003, after which bans on US beef imports were imposed (figure k).

However, the Republic of Korea relaxed its import restrictions on US beef in 2008, resulting in some reduction in demand for Australian beef. US beef (including bone-in product) from cattle under 30 months of age is again allowed into the Republic of Korea. Despite widespread farmer protests in the Republic of Korea when this agreement was reached in April 2008, imports of US beef have increased.

When Japanese restrictions on US beef imports are relaxed, the demand for Australian beef in this market is also expected to fall. However, Japanese imports of US beef continue to be constrained by a restriction allowing only US beef from cattle less than 21 months of age to be imported, and it is not known when this restriction will be removed.

There are also other emerging markets for Australian beef, including the Russian Federation and Indonesia. In 2007-08, exports of Australian beef to the Russian Federation (which

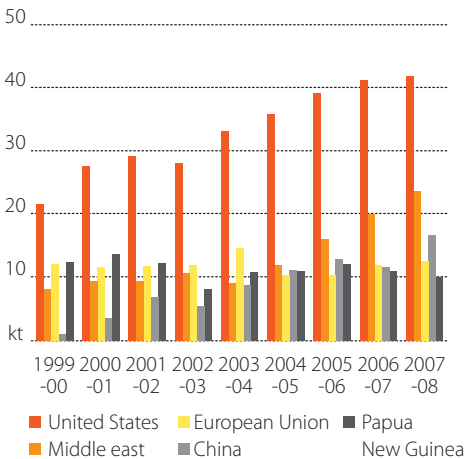
l Australian beef exports to Indonesia and CIS ^a



^a Shipped weight.
Source: DAFF 2008.

comprise the large majority of exports to the Commonwealth of Independent States (CIS)), increased by more than 400 per cent (figure l). The large increase in demand for Australian beef in the Russian Federation reflects declining domestic beef production, strong economic growth and higher prices of South American beef. Australian beef exports to Indonesia have also increased (figure l), as the demand for beef increased.

m Australian lamb exports to selected regions ^a



^a Shipped weight.
Source: DAFF 2008.

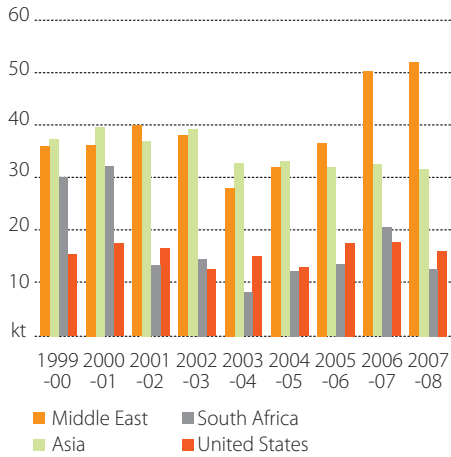
Demand for Australian lamb in export markets has been increasing. This reflects trade liberalisation in the United States, falling production in key lamb markets (particularly the United States and the European Union), limited growth in exports from New Zealand, and rising demand in Asia as consumers look for alternative meats in the wake of disease outbreaks affecting beef and poultry.

Export markets for Australian lamb are highly segmented with the largest single market, the United States, accounting for 26 per cent of total exports in 2007-08. Other important markets include the Middle East, the European Union and China. Strong export growth to these and other smaller markets has been maintained in recent years (figure m).

There are also a large number of export markets for Australian mutton (figure n). Major markets include the Middle East, Asia, South Africa and the United States. While the demand for mutton has remained strong, Australian mutton export volumes are largely driven by supply. Mutton is a lower value meat than lamb and in developed countries it is largely used in manufacturing.

For live sheep, export demand has emanated principally from the Middle East. Most sheep exported by Australia are destined for markets in the Middle East, particularly Saudi Arabia, Kuwait, Oman, Bahrain and Jordan. Exports to these markets represented 86 per cent of the total value of Australian live sheep exported in 2007-08. Increasing incomes in importing countries have been a main factor affecting the growth in demand for live sheep from Australia.

n Australian mutton exports to selected regions a



a Shipped weight.
Source: DAFF 2008.

The largest market for Australian exports of live cattle is Indonesia, taking more than 50 per cent of total shipments since 2003-04. In 2006-07, Israel and Malaysia became the second and third largest markets for Australian live cattle exports, accounting for 9 per cent and 8 per cent of exports respectively.

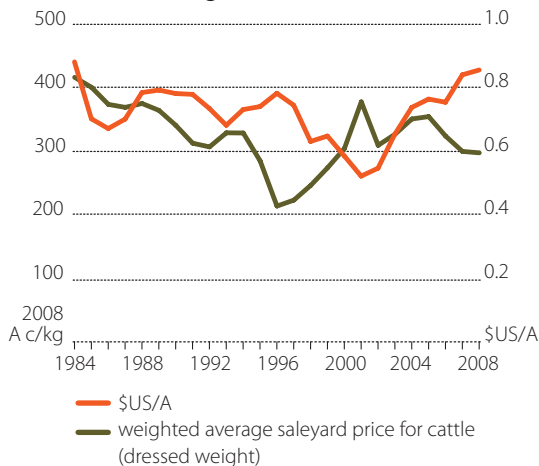
Relatively low prices for imported cattle and a favourable exchange rate underpinned the steady increase in Indonesian demand for Australian live cattle. However, in 1997, the sudden devaluation of the Indonesian rupiah caused a steep increase in the relative price of imported cattle, and Indonesian feedlots closed or opted to source cattle domestically. This drastic decline from pre-1997 levels reflects the sensitivity of Indonesian demand

to changes in import prices. As the rupiah regained its value, import demand for cattle from Australia and other sources resumed (Drum and Gunning-Trant 2008). By 2002-03, Australian live cattle exports to Indonesia had recovered to a record 486 000 head.

Exchange rates

The exchange rate is an important economic variable that influences the sale and purchase of agricultural commodities which are internationally traded. Exchange rates between the Australian dollar and the currencies of Australia's major trading partners influence the cost of imports, the demand for Australian exports and domestic saleyard prices.

o Domestic saleyard cattle prices and exchange rate



Sources: ABARE 2008a and ABS 2009b.

While imports of red meat into Australia are negligible, exchange rate fluctuations influence the red meat sector because a large proportion of Australia's red meat is exported. A stronger dollar translates into relatively more expensive Australian exports in other countries. A currency appreciation will reduce the quantity of Australian meat demanded in export markets as it represents a price increase.

An appreciation of the Australian dollar puts downward pressure on domestic saleyard prices, as seen over the past year. Figure o shows the inverse relationship between saleyard prices and the \$US/\$A exchange rate.

Changes in the Australian dollar have a direct effect on the financial bottom lines of producers, since much of what is exported is priced in US dollars.

Barriers to trade

There are a number of barriers to international trade in beef and sheep meat that affect Australia's red meat industry. The most notable barriers include the country specific EU import quotas on sheep meat and beef. Under the current EU tariff rate quota, 18 786 tonnes (carcass weight equivalent) of sheep meat can be imported from Australia each year, with volumes above this subject to a high above-quota duty. There is a similar tariff rate quota on beef, with up to 7150 tonnes (shipped weight) of Australian high quality beef able to be imported into the EU at a reduced tariff rate.

The United States also has tariff rate quotas on imports of Australian beef. However, these are being eased or removed under the free trade agreement (FTA). All US tariffs on imported Australian beef will be eliminated under the FTA over time. The previous in-quota tariff of 4.4 US cents a kilogram was eliminated from 1 January 2005 and the 26.4 per cent over-quota tariff will be reduced to zero over 18 years. The quota volume is increasing each year under the FTA and for 2009 is slightly more than 400 000 tonnes (shipped weight). In recent years Australian exports to the United States have been below the quota volume.

There is a tariff on beef imports into Japan, a major market for Australian beef. There is a 38.5 per cent tariff on all beef imports, which can be increased to 50 per cent under a special safeguard provision. There are also tariffs in a number of other countries that Australia exports red meat to, including import tariffs on sheep meat entering China, the Republic of Korea and Papua New Guinea. There are tariffs on beef imports in the Republic of Korea, China, Mexico, Canada and many other countries.

Trade barriers between other countries can also have an indirect effect on Australian exports and the red meat and livestock industries in Australia. For example, the restrictions on US beef imports that were implemented in Japan and the Republic of Korea following the discovery of BSE, led to an increase in demand for Australian beef.

6 Conclusions

The red meat sector is vital to Australian agriculture. It is a large contributor to the value of agricultural production and exports and also accounts for a significant proportion of rural and regional employment. Developments in the red meat sector also affect other industries, both upstream and downstream.

There is a greater reliance on the red meat industry, from cattle and sheep production through to meat processing, in regional economies compared with urban economies. However, the reliance on the red meat industry varies across states and regions. For example, parts of the Northern Territory and Queensland are heavily reliant on the cattle industry, while parts of New South Wales and Victoria are reliant on the sheep industry. Reliance on meat processing is reflected in the size and location of processing plants.

The proportion of Australian red meat exported has increased over time. External factors such as changes in trade barriers, exchange rates and competition from other red meat exporting countries can have a large effect on the industry as well as on regional economic activities.

Understanding the effects on the industry of domestic and external factors may assist in designing policies affecting the industry and regional economies where red meat production and processing are important economic activities.

With the construction of regional databases (appendix B) covering red meat industry activities, this research provides a basis for further analysis of factors influencing developments in the red meat industry and on regional economic activities, using an economy-wide modelling framework such as ABARE's Ausregion model (for a description of the Ausregion model, see ABARE's website).

A Selected industries in 2004-05 input-output table

sector	industry	description
Agriculture	Beef cattle	Beef cattle from feedlot operation and farming
	Pigs	Farmed and raised pigs
	Poultry	Raised meat breed chicks (including chicken, duck, goose and turkey) and hatching egg breed chicks
	Sheep	Sheep farming for prime lambs, raw sheep milk and wool
Manufacturing	Bakery	Breads, cakes, pastries (including crumpets, doughnuts, slices, meat pies and pies) and biscuits
	Leather and leather products	Tanning and fur dressing as well as manufactured leather (including machine belting, suitcases, handbags and wallets)
	Meat and meat products	Processing (including slaughtering, boning, freezing, preserving and packing) meat products
	Oils and fats	Manufactured vegetable oils, fats, margarine, cooking oils and blended table or salad oils
	Other food products	Processed sugar, seafood, prepared animal and bird feed and snack foods
	Paper containers and products	Cardboard, newsprint, paper pulp, paperboard, solid fibreboard sheets and wool pulp
	Soaps and other detergents	Manufactured soap productions, detergents, toothpastes, disinfectants, glycerine and candles
Services	Accommodation, cafes and restaurants	Accommodation (hotels, motels and other short- term accommodation), pubs, taverns, bars, cafes, restaurants and clubs
	Retail trade	Food, personal and household good and motor vehicle retailing (other than repairs)
	Road transport	Freight (including delivery service, long haulage and road freight service) and passenger (including long and short distance bus and taxi)
	Wholesale trade	Basic material (including farm produce, minerals, metals and chemicals), machinery and motor vehicle, and personal and household (including food, drink, tobacco, textile, clothing, footwear and household) good wholesaling

Sources: ABS 1993, 2004.

appendix **B** Regional database

To make a suitable framework for the analysis of the effects of changes in economic variables on regional economies, the regions of interest have to be represented in a model. This requires the construction of a database representing the economy of the identified region. The regional databases for the four regions identified in chapter 4 are described below.

Regional economy databases

For each region the database comprises two major components. One component is the input-output table, which represents the structure of production and consumption of the region, and the other is the database relating to demographics and employment.

Input-output

Input-output tables are the core data set for general equilibrium models. There are no existing regional input-output tables so they have to be constructed. The key information required to construct the regional input-output tables are production of goods and services. The values of production at the regional level are used to estimate the production shares of that region in the Australian state where it belongs. For the agricultural industries, the values of production in each of the four regions are estimated using the value of agricultural commodities produced from the ABS 2001 Census of Agriculture, available at the Statistical Local Area (SLA) level. The values of production for non-agricultural and food processing industries are not directly available from statistical data at the SLA level. They were estimated by using the shares of employment in these industries relative to the total employment in each region at the SLA level using ABS employment data.

Figure P shows the basic structure of the database representing transactions by economic agents. The columns identify the following agents:

- 1 domestic producers divided into I industries in R regions
- 2 investors divided into I industries in R regions
- 3 a single representative household for each of the R regions
- 4 an aggregate foreign purchaser of exports
- 5 an other demand category corresponding to R regional governments
- 6 an other demand category corresponding to Australian Government demands in the R regions.

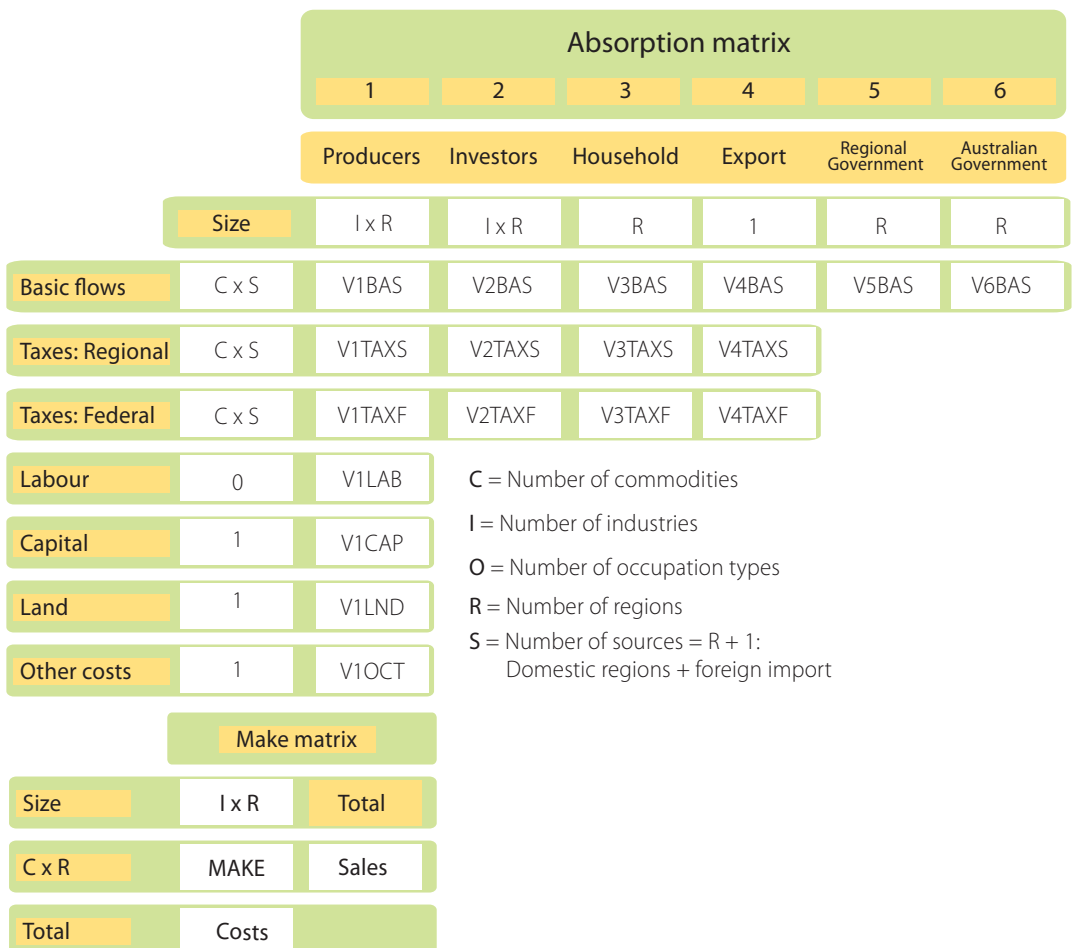
The rows show the structure of the purchases made by each of the agents identified in the columns. Each of the C commodity types identified in the model can be obtained within the region, from other regions or imported from overseas. The source-specific commodities are

used by industries as inputs to current production and capital formation, are consumed by households and governments, and are exported. Only domestically produced goods appear in the export column. Various types of commodity tax are payable on the purchases. As well as intermediate inputs, current production requires inputs of three categories of primary factor: labour (divided into O occupations), fixed capital and agricultural land. The other costs category covers various miscellaneous industry expenses.

Each cell in the input-output table contains the name of the corresponding matrix of the values (in some base year) of flows of commodities, indirect taxes or primary factors to a group of users. For example, V1BAS is a four-dimensional array showing the cost of C goods, from S source (domestic and imported), to I producers in R regions.

The make matrix shows the structure of production and sales of a commodity.

p A schematic representation of the core database



C Selecting red meat industry regions

There are many regions across Australia reliant on stages of red meat production, from sheep and cattle farming to meat processing. Regions representing the different facets of the red meat industry in Australia were selected and identified using the ABS 2005-06 Agricultural Census (2008f) and 2006 Census of Population and Housing (2007). These statistical publications enabled small area regional analysis to be undertaken using data for statistical local areas (SLAs). Contiguous groupings of SLAs enabled areas dependent upon red meat producing and processing to be determined.

The sheep and cattle regions were identified by examining the value of production of cattle and calves or sheep and lambs slaughtered in each SLA, in conjunction with either total beef cattle numbers or lambs sold over the year. Lambs sold were selected to represent the sheep meat industry instead of total sheep and lamb numbers to ensure that a region reliant on the lamb industry was selected, rather than a region more reliant on wool.

On a state-by-state basis, the proportions of each SLA's contribution to the state's total, for each respective data series, were sorted into descending order. From this list, the SLAs contributing significantly to the state's total were marked on a map. From these SLAs, several potential regions were then formed across Australia.

Unlike the previous region identification method, potential meat processing regions could not be identified from production values, because of data confidentiality issues. Instead, the proportion of workers employed in meat processing for each SLA was used. Intuitively, if a region processes a significant amount of red meat it would stand to reason that there would also be a high level of employment in the industry.

The identifying of potential meat processing regions was undertaken in a similar way to the other regions. On a state-by-state basis, each SLA's proportion of employment in meat processing was sorted into descending order, with those with a high proportion being marked on a map. Contiguous regions across Australia were formed, with continual calculations of the proportion as new SLAs were included.

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02.09

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CRC Plant Biosecurity

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DN Harris and Associates

European commission

Fisheries Research and Development Corporation

Fisheries Resources Research Fund

Forest and Wood Products Australia

Grains Research and Development Corporation

Grape and Wine Research and Development
Corporation

Horticulture Australia

International Food Policy Research Institute

Land and Water Australia

Meat and Livestock Australia

National Australia Bank

OECD

Rural Industries Research and Development
Corporation

The Treasury