Topic 1: Introduction to the Australian Sheep Industry

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Learning objectives

On completion of this topic you should be able to:

- articulate your understanding of the Australian environments in which sheep production is undertaken, specifically rainfall patterns and how these influence pasture growth and composition
- describe the range of Australian sheep enterprises, including the difference between specialist woolgrowers, prime lamb producers, dual purpose enterprises and mixed enterprises, the determinants of farm income, the major production costs and the variation that exists in farm productivity and profitability between individual farms within a district

Introduction to the topic

This topic will introduce the key factors that characterise the Australian sheep industry including the environments in which wool and sheepmeat are produced, the different enterprises responsible for sheep production and their relative contributions to the industry, historical and current trends in sheep population and wool and sheepmeat production and state and regional differences in sheepmeat and wool production.

1.1 Sheep production environments in Australia

There are many environments in which sheep production is undertaken (Figure 1.1). The major factor influencing these environmental differences relates to rainfall pattern, in terms of the average annual rainfall, when this rainfall is predominantly received (i.e. within-year seasonality) and the variation in rainfall from year to year. These patterns influence the pasture base used for sheep production, influencing both wool and meat productivity per unit area of grazing land and wool quality issues. Rainfall patterns also impact on sheep productivity via aspects of sheep health and disease, especially in relation to parasitic infection (incidence and type of parasite).

Figure 1.2 shows the three broad sheep production zones: high rainfall zone; wheat-sheep zone; and pastoral zone. The major factor differentiating between the zones is average annual rainfall, ranging from 500-1000mm for the high rainfall zone, 400-700mm for the wheat-sheep zone and 150-400mm for the pastoral zone. These differences in annual rainfall generate differences between zones in patterns of pasture growth and the opportunities for other enterprises such as cropping.

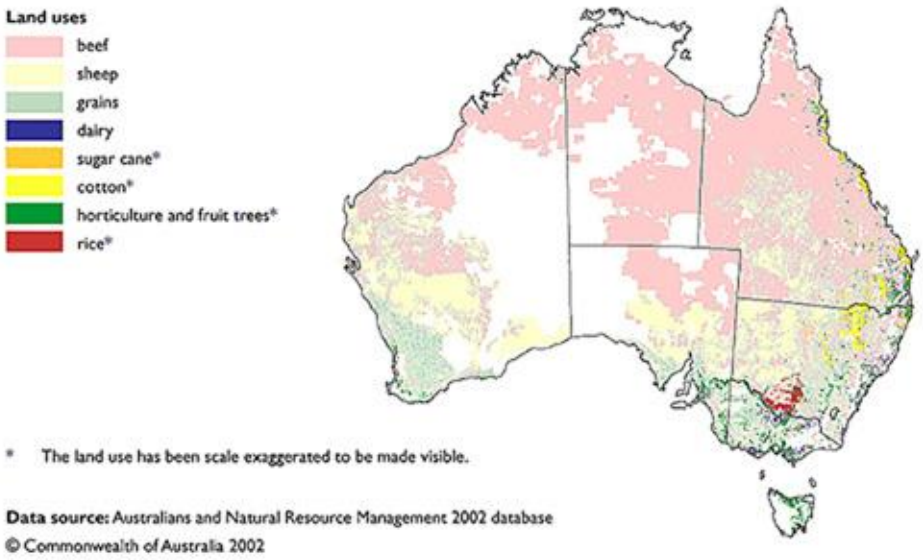

Figure 1.1: Agricultural land use in Australia (ANRA 2006).

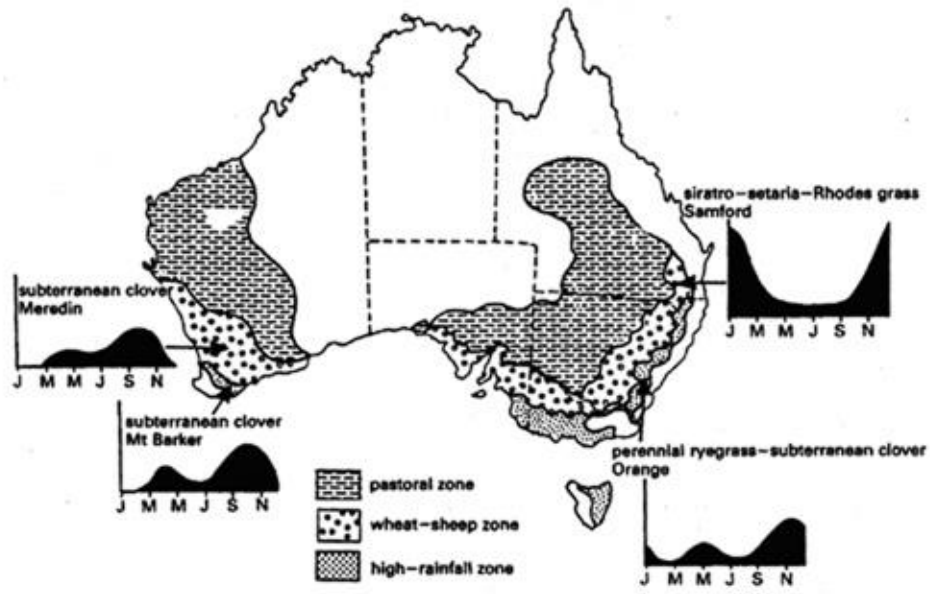

Figure 1.2: The three sheep production zones of Australia, showing pasture growth curves for improved pastures in selected locations (Chapman *et al*. 1973).

Within any one of the three production zones, there are also differences between regions in terms of the predominant season in which rainfall is received (summer, winter, uniform or non-seasonal) and the level of between-year variation in annual rainfall. This exerts a strong influence on the dynamics of the pasture base (Figure 1.2), particularly in terms of:

- start and duration of the pasture growing season
- species composition (e.g. grasses, legumes, broad-leaved weeds, shrubs)
- pasture stability (e.g. annuals or perennials)
- pasture quality and palatability
- scope for pasture improvement and sustainability.

The climatic profile of a specific production environment also has implications for sheep health and disease, given that moisture and temperature are key factors influencing the prevalence of many sheep diseases.

1.2 Production profile of the Australian sheep industry

Australian sheep population

Sheep numbers in Australia peaked in 1989-90 at 173 million but since then have been steadily declining to reach its lowest number since 1887 of 68 million in 2009-10 (ABARES Mar 2011). This decline was associated with the collapse of the Reserve Price Scheme in 1990-91 and the subsequent decline in wool prices and the move away from wool production towards more profitable enterprises. However, with the recent increases in lamb prices sheep numbers have stabilised and are forecast to grow as producers build up ewe numbers to capitalise on improved sheep prices. The Australian sheep population is currently estimated to be 72 million (MLA 2014).

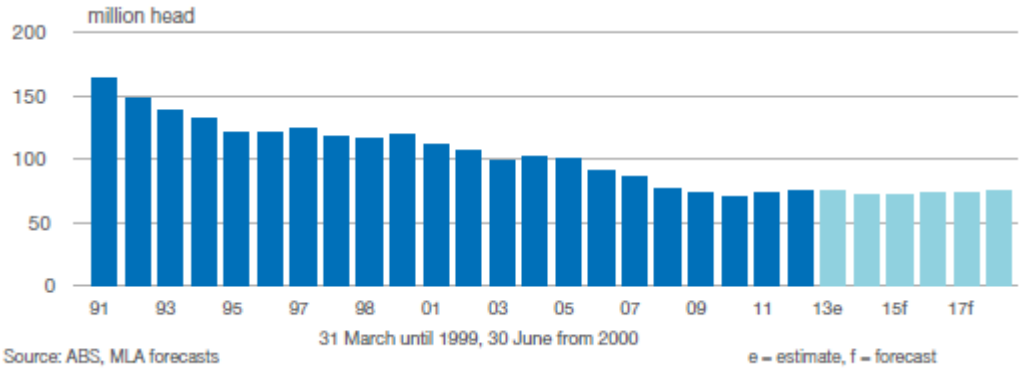

Figure 1.3: Trends in the Australian sheep flock from 1991 to 2013 (MLA 2014).

The value of the sheep industry to the Australian economy in 2011-12 was $5.6 billion ($2.9 billion from sheepmeat products and $2.7 billion from wool) equating to 12% of the gross value of agricultural commodities to the economy (ABS 2013). Table 1 outlines the national sheep population by state and the value of sheep meat and wool production by state. Not surprisingly, given the distribution of sheep production environments in Australia (section 1.1), NSW, Victoria, WA and SA have the highest proportion of the sheep population and the greatest value of production.

There are a range of sheep producing enterprises in Australia including specialist wool producers, prime lamb producers, dual purpose and mixed enterprises. Of approximately 30 022 farms producing sheep, 11 944 are specialist sheep producers (includes wool, prime lamb and dual purpose producers) however, the majority of sheep products comes from mixed enterprises (ABS 2014). Dual purpose enterprises are those where at least 25% of income is from wool production and at least 25% is from lamb production. Mixed enterprises are those that include sheep production as a side line to cropping or are mixed beef and sheep producers.

Table 1.1: Sheep population by state and value of wool and sheep meat production by state (ABS 2013a, 2013b).

	Sheep numbers (millions)	Wool value ($mill)	Sheep meat value ($mill)
New South Wales	27.6	869	616
Victoria	15.9	671	1135
Queensland	3.5	115	59
South Australia	10.9	432	551
Western Australia	14.4	549	485
Tasmania	2.4	96	54
Australia	74.7	2734	2900

Wool production

Australia is the world's largest wool producing country, accounting for about 24% of world production in 2012. However, wool production in Australia has been steadily declining, as shown in Figure 1.4, associated with fluctuating wool prices. The composition of the national wool clip has also been changing with an increase in fine wool production and a decrease in medium wool production. From

1989-90 to 2008-09 the average diameter of wool offered has fallen by about 1.8µm (Curtis 2009). New South Wales continues to be the largest producer of wool followed closely by WA.

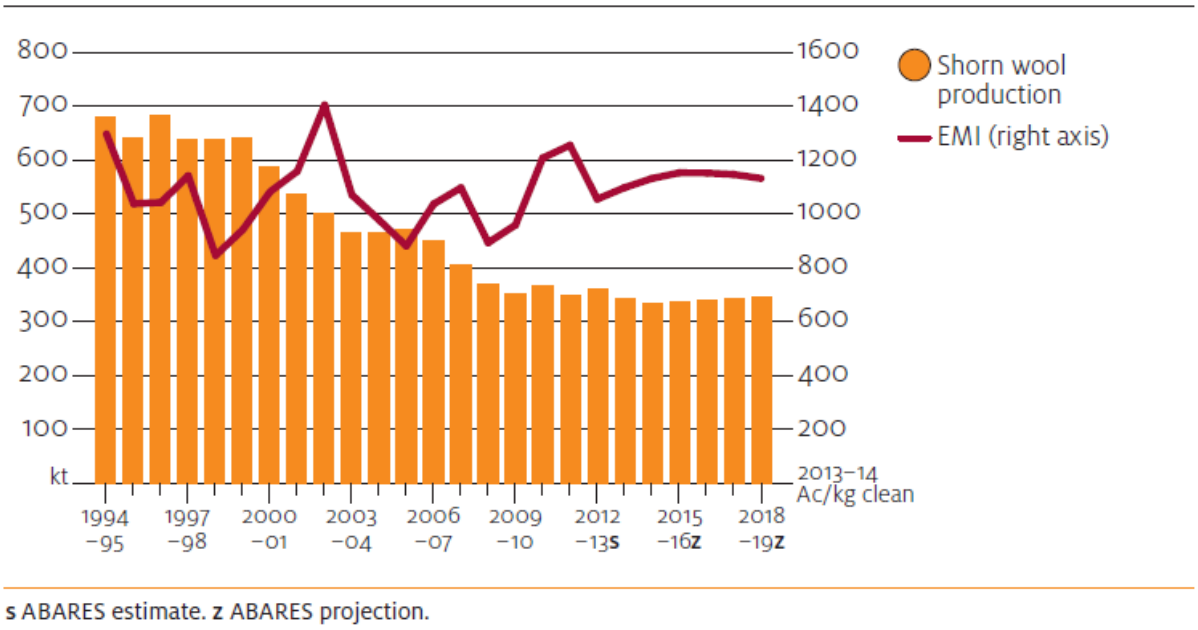

Figure 1.4: Trends in Australian wool production and wool price (ABARES 2014).

The majority of the national sheep population comprises Merino sheep, of which there are a number of strains differing genetically in performance for the key determinants of farm profitability. However, from the wool market's point of view, they are commonly distinguished on the basis of fibre diameter, giving rise to superfine (<18.6µm), fine (18.6-20.5µm), medium (20.6-22.5µm) and broad or strong (22.5-24.5µm) wool Merino types.

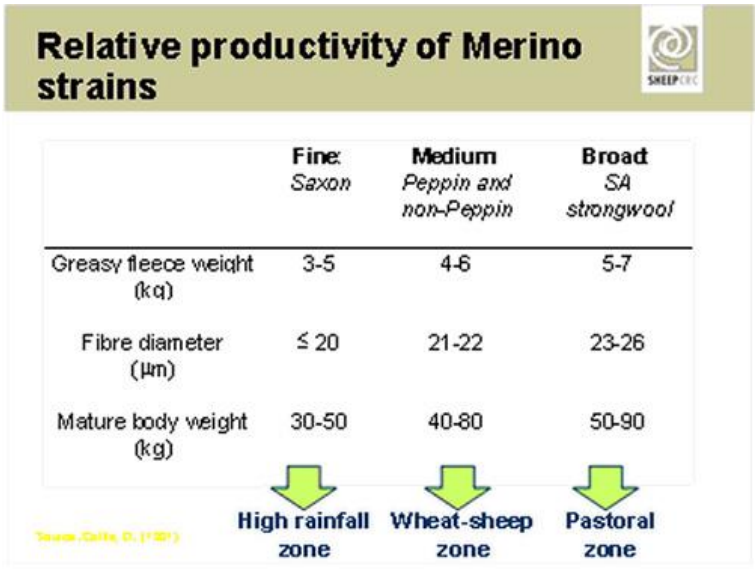

Figure 1.5: Merino strains (Cottle 2005).

Importantly, there is an association between Merino type and production environment, with fine and superfine wool types prevalent in the high rainfall zone, medium wool types in the mixed farming zone and broader wool types in the pastoral zone. Each production zone will therefore have different priorities for wool production on the basis of different production capacity and product type associated with the particular genotype prevalent in that environment.

It is also worth noting that approximately 75% of the national sheep flock comprises animals with high nutritional demand due to physiological state. That is, breeding ewes which are subjected to the demands of pregnancy and lactation, and young sheep (lambs and hoggets), which are subjected to the demands for growth.

Australia is the largest exporter of wool with the major market being China. China's demand for Australian wool increased from 38% in 2002 to around 77% in 2012 (ABARES 2013) due to lower European demand. In 2011/12 India was Australia's second largest wool export country. The projected growth of India's processing sector is likely to increase competition with China for Australian greasy wool exports. Figure 1.6 shows the trends in Australian wool exports.

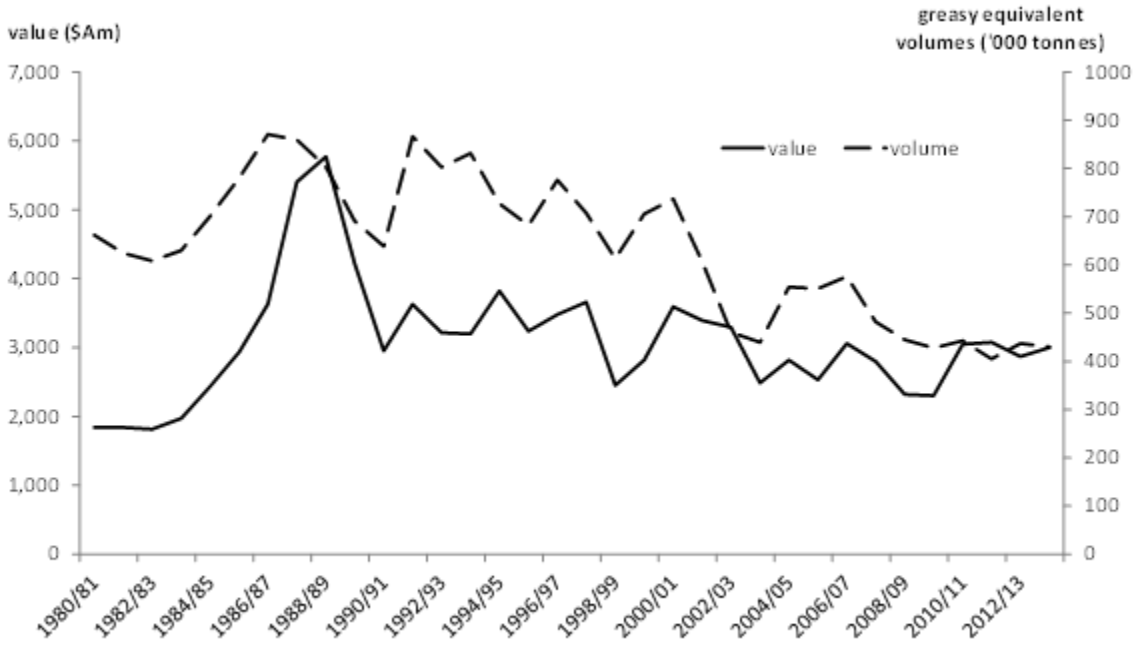

Figure 1.6: Trends in Australian wool exports (ABS, The Woolmark Company 2014).

Meat production and consumption

Domestic consumption of sheep meat per capita has been steadily declining in conjunction with increasing consumption of poultry and pork (Figure 1.7). In 2012-13 Australians consumed on average 9.9kg of lamb and 0.2kg of mutton per person per year (MLA 2014). However, total sheep meat production has remained fairly steady (Figure 1.8) due to population increases and strong export demand for Australian lamb and mutton. However, as Figure 1.8 shows the proportion of mutton production has been steadily declining while lamb production grows.

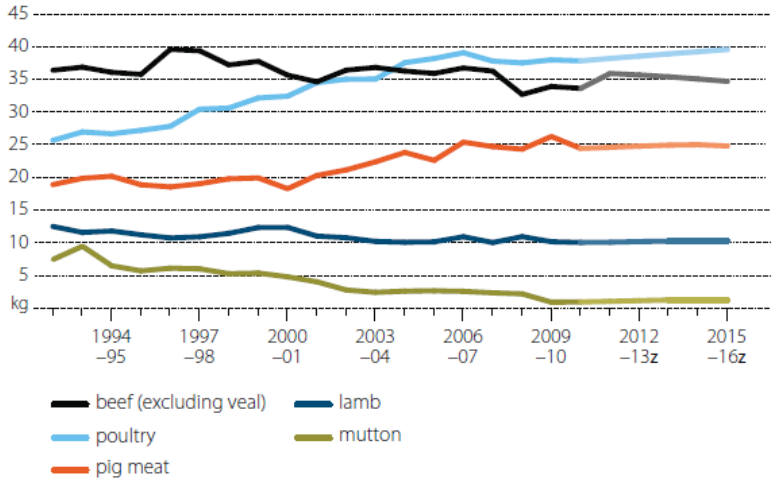

Figure 1.7: Australian meat consumption per head per year (ABARES 2011).

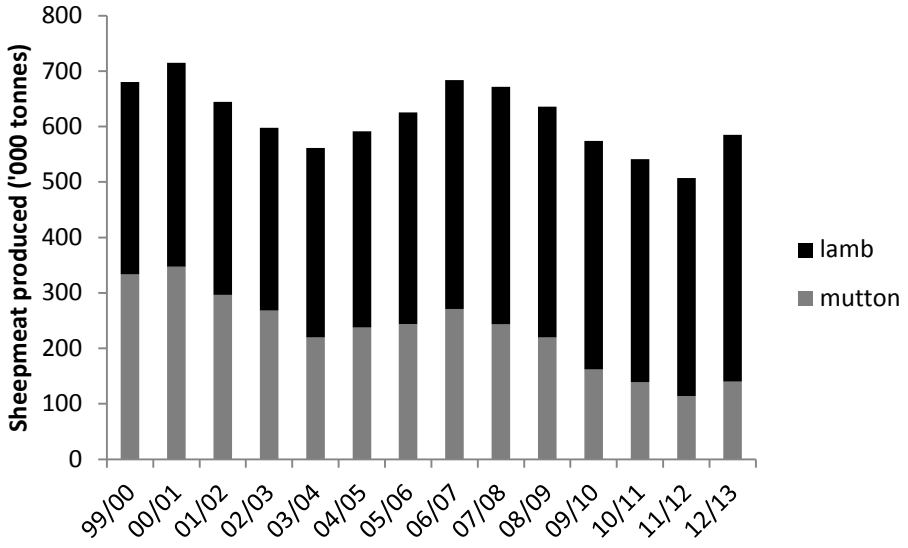

Figure 1.8: Trends in production of sheep meat (ABS 2013).

In 2012-13 Australia produced 183 000t of mutton and 457 000t of lamb of which 144 000t and 201 000t, respectively, were exported (ABARES 2014). The majority of sheepmeat was produced in Victoria followed by New South Wales and South Australia as shown in Figure 1.9.

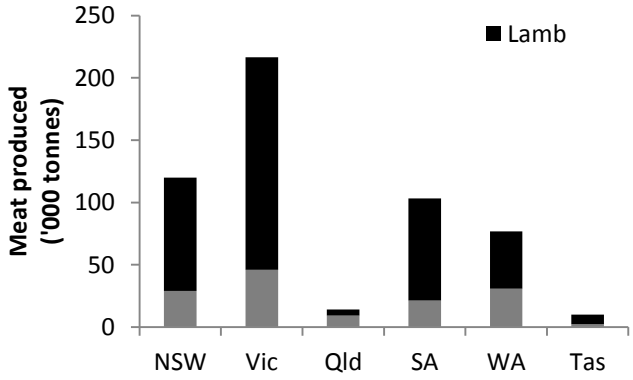

Figure 1.9: Lamb and mutton production (tonnes) by state (ABS 2013).

Australia is the second largest sheepmeat exporter in the world following New Zealand. In 2014 Australia is expected to export 79% of its mutton production and 56% of its lamb production with lamb exports valued at $1.3 billion (ABARES 2014). The key export markets for Australian lamb are the Middle East, the US and North Asia. The Middle East and South East Asia are the major markets for Australian mutton. The volume of lamb exports has been steadily increasing as shown in Figure 1.10 and this trend is expected to continue with strong demand from the US and Asia.

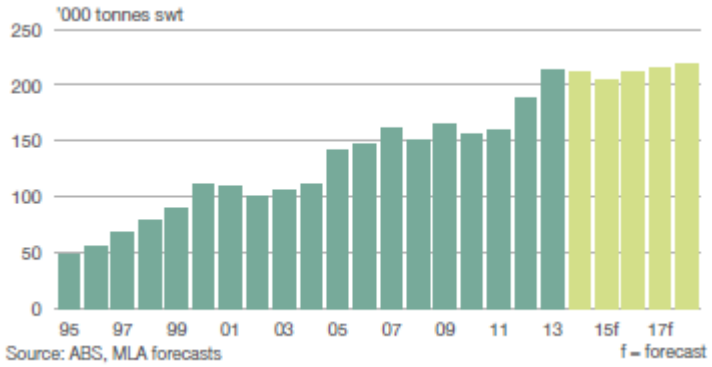

Figure 1.10: Australian lamb exports (MLA 2014).

Australia is also the largest live sheep exporter in the world with 1.88 million sheep exported in 2013 down from 2.3 million in 2012. Almost all of these animals went to the Middle East with the main importing countries being Kuwait, Qatar and Jordan (Figure 1.11). The majority of live sheep are shipped from WA with a small number from Victoria and South Australia (Figure 1.12).

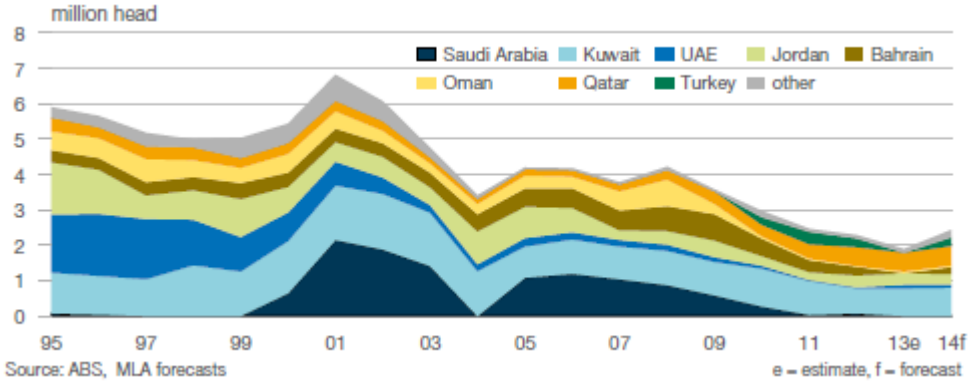

Figure 1.11: Live sheep exports by destination (MLA 2014).

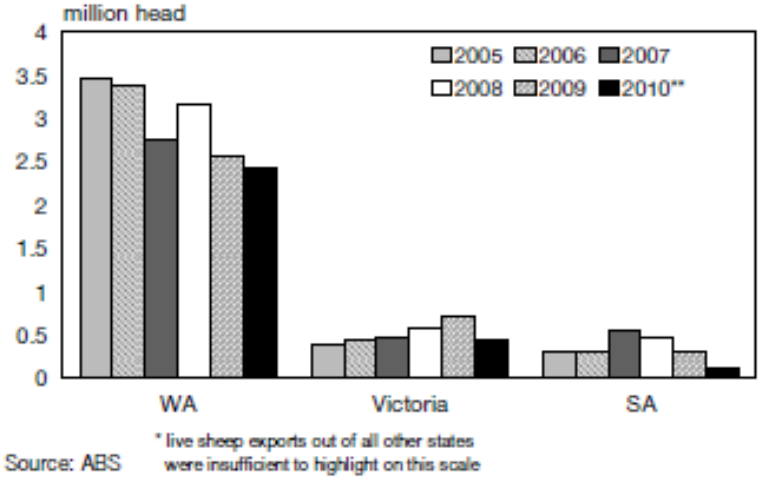

Figure 1.12: Live sheep exports by state (Australian sheep industry projections 2011).

1.4 Sheep Breeds in Australia

Australian sheep growers have bred sheep for the production of meat and wool that suit particular climatic and geographical conditions in various parts of the country. There are many sheep breeds that suit particular areas of Australia for various reasons. Sheep are bred to have particular progeny attributes and the required constitution and soundness to survive in specific climatic and geographical conditions.

Breeds are generally grouped under the following headings:

- Merino and Merino derivatives including superfine, fine, medium and strong Merinos which are used to produce high quality wool. Merino derivatives include the Dohne and South African Meat Merino (SAMM) which are considered to be dual purpose breeds.
- British Long Wool breeds including Lincoln, Border Leicester and Romney Marsh which are better known for their meat characteristics.
- British Short Wool or Downs breeds including Southdown, Dorset and Suffolk for prime lamb production
- Australasian breeds including Coopworth, Corriedale, Polwarth, Perendale, Poll Dorset, Gromark and South Suffolk. The Corriedale and Polwarth have been developed as dual-purpose sheep. They have good wool producing and mutton characteristics and a most satisfactory reproductive performance.
- Carpet wool breeds including Tukidale and Drysdale are bred specifically for production of carpet wools.
- Shedding breeds including Awassi, Dorper and Damara which are used mainly for meat production and cross breeding purposes.

For more information on sheep breeds see chapter 1 of the International Sheep and Wool Handbook.

Crossbreeding involves mating various pure breeds to produce a crossbred type to suit particular requirements, for example:

- environment (climatic conditions)
- availability of feed (natural, improved or supplementary)
- quality of carcase (export)
- wool (reasonable value)
- hybrid vigour – growth rate
- mothering ability (e.g. first cross vs pure Merino).

The following breed characteristics are important in crossbreeding:

- Merino: quality of wool.
- British Long Wool (BLW): large frame, good mothering ability, twinning factor, milk value.
- British Short Wool (BSW): compact frame, quick maturing, quality meat.
- Australasian breed: quality of wool, large frame, good mothering ability, good milking, twinning factor.
- Carpet Wool breeds: specialist wool, quality meat.
- Shedding Wool breeds: good mothering ability, quality meat, ability of some to thrive in semi-arid environments.

Wool growers have traditionally bred First Cross ewes to sell to prime lamb breeders. Generally, these wool growers are from the Sheep/Wheat Zones of Australia (see Figure 1.1). A requirement for growing out prime lambs is good finishing pastures or fattening crops. These conditions exist in High-Rainfall Zones. In recent years, wool growers from High-Rainfall Zones have entered the prime lamb market by crossing Merino ewes directly with British Short Wool rams. This crossbreeding enables rapid entry into the prime lamb market. A shortfall of this crossbreeding is that the lambs have only a short opportunity for sale. As the lambs carry a direct line to the Merino, they carry a strong wool-growing trait. When the lambs are approximately three months old, their milk and feed intake is directed to wool growth rather than to body growth. Increasingly, Merino stud breeders are considering body and meat traits as part of the selection criteria, which includes higher twinning rates and milk production.

1.5 Determinants of sheep enterprise profitability

Traditionally, sheep enterprises in Australia have derived the majority of their income from wool production with clean wool produced and the value of wool per kg being the major determinants (50 – 80%) of profitability. However, as the structure of the sheep industry has changed to include more prime lamb producers, dual and mixed enterprises the major determinants of profitability have also changed. The price received for lambs and the sale of surplus sheep now make up the majority of sheep enterprise income.

Table 1.2 outlines the key profit drivers for a wool producing enterprise and a prime lamb enterprise. The relative influence of these indicators to individual sheep enterprise profitability will depend on the proportion of income derived from wool or meat.

For an individual farm enterprise, annual variations in profitability are a reflection of annual variations in productivity, product value and production costs. A number of studies have shown that of the three, annual variation in product value is by far the largest (possibly up to 38% either side of the enterprise average) followed by variation in productivity (±15%) and production costs (±10%). It is important to understand how the production system responds to seasonal changes, to enable long-term production and marketing strategies to be implemented.

Table 1.2: Key performance indicators for wool and prime lamb production (Sackett and McEachern 2003 and Dickson *et al.* 2011).

Wool production	Prime lamb production
Cost of production/kg clean wool	Stocking rate
Price received/kg clean wool	Lambing percentage
Price as % of micron indicator	Carcase price
Clean fleece weight	Growth rate
Average adult fibre diameter	Breed of lambs
Number of surplus sheep sold	Cost of production
Sale price of surplus sheep	Mortality rate

1.6 The changing Australian sheep industry

The Australian sheep industry has undergone many changes in the last 25 years and will continue to change to meet consumer demands for high quality fibre and meat products. The Australian sheep industry has become more cohesive rather than having the wool and meat industries considered as separate entities. This has happened due to increasing income from sheep meat compared to wool and a move to the use of more cross breeding and meat breeding rather than pure Merino breeding. Changes have also occurred due to increasing input costs without associated increases in price received, changes in consumer attitudes to animal welfare, extended periods of drought and the possibility of climate change and its implications for sheep producers (Rowe 2010). Due to these changes in the production environment the Australian sheep industry will continue to change and develop to remain productive and profitable. Rowe 2010 provides a good explanation and interpretation of these factors on the Australian wool industry.

1.7 The Australian sheep industry – an heterogeneous industry

Given the preceding information, it is imperative that the Australian sheep industry be viewed as a highly heterogeneous industry. That is, it is inherently variable in terms of:

- priority given to the wool and meat production enterprise
- constraints and opportunities for wool and meat production
- attributes of the wool and meat product
- determinants of enterprise profitability
- sociological attributes of sheep producers.

It is therefore critical that the needs of a heterogeneous industry be considered when identifying strategies for improving productivity, product quality and enterprise profitability. It is unlikely that there will be one solution that is appropriate to the needs of all sheep producers.

Readings

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Revision Questions

1. What are the three sheep production zones in Australia and how do they differ?

2. What are the different enterprises types that sheep and wool are produced from?

3. How has the Australian sheep industry changed over time?

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