



# The Value Chain for Meat and Livestock Products

Main report

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Animal Production

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## ABBREVIATIONS AND ACRONYMS

AACM AACM International Pty. Limited.

- ABARE Australian Bureau of Agricultural and Resource Economics.
- ABRI Agricultural Business Research Institute.
- ABS Australian Bureau of Statistics.
- AQIS Australian Quarantine Inspection Service.
- AWC Australian Wool Corporation.
- CIF Cost Insurance and Freight.
- DPIE Department of Primary Industries and Energy.
- FAS Free Alongside Ship.
- FOB Free On Board.
- GM Gross Margin.

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- MRC Meat Research Corporation.
- OMP Other Meat Processing.
- RADIS Research and Development Investment Strategy Study.
- R&D Research and Development.
- WPR Western Pacific Rim.

## THE VALUE CHAIN: A SUMMARY OF THE MODEL AND ITS RESULTS

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## 1. INTRODUCTION

This report describes an update of the value chain model of the Australian Meat and Livestock Industry. The model, originally developed for use in the Meat Research Corporation's (MRC's) Research and Development Investment Study (RADIS), is a detailed physical and financial description of meat and livestock production, processing and retailing. Following completion of the RADIS study, the value chain has and will be regularly updated for the benefit of those in the industry who demand a detailed understanding of:-

- how their part of the industry interrelates with all other parts of the industry;
- the level of costs and incomes throughout the industry; and
- the contribution of each part of the industry to total industry output.

This update of the model is based on industry data for the period 1991/92 to 1993/94. Three years data have been averaged so that the model is more indicative of the general situation rather than a brief glimpse of the industry at a specific time.

## 2. THE VALUE CHAIN MODEL

### 2.1 WHAT IS THE VALUE CHAIN AND WHAT DOES IT SHOW?

The value chain is a computerised model which has been constructed to illustrate the product and money (i.e. financial) flows which occur throughout the Australian Meat and Livestock Industry. It provides an overview of the industry and the linkages between the industry and other parts of the Australian economy, including consumers of meat and livestock.

The value chain specifies product-related information for each sector of the industry including farms, feedlots, abattoirs, tanneries, wholesalers, retailers and exporters. The type of product-related information includes:-

- the stage of product conversion or transformation from live animal to meat and meat by-products.
- the nature and quantity of products (i.e. raw materia's) brought forward from previous stage(s) of processing;
- materials and services brought into the chain from outside the industry; and

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• the nature and quantity of products which progress to the next stage of processing, or to consumers.

Each physical input or output is linked directly to a price. Therefore, the model also specifies financial information for each sector in the industry, including:-

- the value of products brought forward from previous processing stage(s);
- the cost of materials and services purchased from outside the chain;
- income accruing at each stage from sales of products;
- transport, storage and handling costs incurred in moving product between processing stages; and
- the difference between total income earned and the total cost of inputs purchased, which is equivalent to operating profit or, in economic terms, value added.

The calculation of value added gives the value chain its name. For the purposes of this study value added has been defined as the difference between total income and the total cost of all inputs (materials and services) used in production. Thus, value added can also be considered as an annual operating profit. The sum of all value added by all production units within an industry equals the total industry net income (net of costs). Similarly, the sum of all value added by the production units within a nation equals the total net income of that nation which is referred to as Gross Domestic Product (GDP). The value chain therefore shows the contribution of production, processing and retailing activities to Meat and Livestock Industry income. Total Meat and Livestock Industry value added divided by Australia's Gross Domestic Product reflects the contribution of the industry to the Australian economy.

Despite the detailed information available from the value chain, the model does not show the effect of changing production levels on prices, nor does it indicate the effects of price and cost changes on production. It is therefore no more than a snapchot of the industry and cannot be used to forecast the effects of price changes or variations in production levels.

The model is divided into cattle and sheep industries, each with eight sectors (farm, feedlot, abattoir, other meat processing, tannery, wholesale, retail and export). Most sectors are also divided into subsectors. For example, the farm sector is divided into 15 subsectors which cover 15 geographic regions. For each subsector, inputs and outputs are specified together with their prices (see Figure 1). The result is a detailed physical and financial description of the entire Meat and Livestock Industry. Figure 2 provides a very simplified picture of the value chain. Cattle and sheep producers are linked physically and financially to the processors who, in turn, are linked physically on the retailers.

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## FIGURE 1 : SECTORS AND COMPONENTS IN THE VALUE CHAIN



FIGURE 2 : OVERVIEW OF THE CATTLE AND SHEEP VALUE CHAINS



DELIVERING PRACTICAL SOLUTIONS

To make the value chain easy to follow, inputs used and products produced are defined in two different ways. Inputs used by each sector (i.e. farm, feedlot, etc.) can either be purchased from another sector within the industry (e.g. cattle are purchased by feedlots from farms) or they can be purchased from "outside" the industry (e.g. labour, transport, animal feed, services, interest, etc.). Similarly, products from one sector can either be sold to another sector for further processing or they can be sold to consumers. The differences between the two types of inputs and outputs are shown throughout the value chain:-

- Inputs purchased from "outside" the industry are called external inputs.
- Product: sold to consumers "outside" the industry are called external outputs.

For example, in the annexes to this report which reproduce the value chain in full, inputs which the abattoir sector purchases from farms or feedlots (i.e. livestock) fall under the heading of inputs from other sectors. However, inputs purchased from "outside" the industry fall under the heading of external inputs.

Just as inputs and outputs car, be external, so too are the associated costs or revenues. External inputs and outputs are purchased from or sold to the external environment (i.e. businesses/consumers outside the bounds of the Meat and Livestock Industry).

The primary purpose of the value chain is to track the movement of meat through the industry. Hence, although milk, wool, hides and skins are shown as a source of income, they are treated as external outputs from the sector in which they are produced. For example, hides and skins are an important source of income for abattoirs, and the model shows that they are purchased by the tannery sector and processed into leather. However, the leather is treated as an external output from the tanner; sector - as if it was sold directly from the tannery to consumers outside the industry.

2.2

## WHAT ARE THE RESULTS AND WHAT DO THEY MEAN?

The value chain produces a large number of figures (physical and financial) related to input and product flows, and costs and incomes throughout the Meat and Livestock Industry. The main findings relevant to each industry sector are discussed below.

## 2.2.1 The Farm Sector

### What is the Farm Sector?

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The farm sector in the value chain covers cattle and sheep production. Animals are raised on farms and a proportion are consigned either to feedlots or to abattoirs. The farm sector is the most diversified of the eight industry sectors in the value chain model. The meat production process differs between geographic regions, according to the balance between the beef and dairy cattle populations and between wool and prime lamb production. To allow the model to handle this diversity, the farm sector has been disaggregated into 15 subsectors which cover 15 geographic regions. Further disaggregation has occurred to distinguish between specialist beef production (excluding dairy cattle) and prime sheep production (excluding wool sheep).

### The Farm Sector and the Meat Industry : Links of Importance

Figure 3 illustrates how the farm sector is linked into the Meat and I ivestock Industry through the sale of animals to the feedlet, abattoir and export sectors. In simplistic terms, every year a proportion of animals from farms are sold to feedlots, abattoirs or for live export. Costs are incurred in raising the animals and income flows back to the farms through the sale of animals, milk and wool. Provided incomes exceed costs, an operating profit is achieved or, in economic terms, the farm sector adds value to the animals and their by-products. The average price of sheep and cattle sold from the farm sector during the period 1991/92 to 1993/94 is shown in Figure 3.



FIGURE 3 : THE FARM SECTOR AND THE VALUE CHAIN

## Farm Sector Inputs

#### Inputs Purchased from Other Sectors

The value chain uses the "arm sector as a starting point. It is based on the assumption that an mals are not purchased but are owned by farmers in numbers; reported by the Australian Bureau of Statistics for each region. Therefore, there are no raw material inputs for the farm sector An opportunity cost of \$500 million has been placed on the cattle herd and sheep flock based on a long term return to investment of five percent. The opportunity cost represents the cost of keeping livestock on farm as opposed to selling them all and placing the receipts in an interest bearing investment.

#### Inputs Purchased Externally

In raising livestock, farmers utilise a number of materials and services purchased outside the Meat and Livestock Industry. These inputs include items such as fertiliser, fodder, labour, wages, freight, selling costs, shearing and crutching. Costs vary among the 15 regions within the value chain, the total annual cost of raising cattle and sheep is estimated to be S4.0 billion and \$3.2 billion respectively (note-these figures do not include opportunity cost).

#### Products

. . . . There are four major products produced by the farm sector: cattle, sheep, milk and wool. Milk and wool are by-products of the Meat and Livestock Industry and the value chain assumes that they are sold on to processors, thereby moving out of the industry and the model. Cattle and sheep are sold to either feedlots or directly to abattoirs for processing. In total, the cattle industry sells \$6.4 billion worth of produce, \$2.7 billion of this is milk sales. The sheep industry sells \$3.0 billion worth of produce and \$2.4 billion of this is derived from the sale of wool. When factoring out the influence of dairying and wool production, sales from specialist beef and prime sheep production were \$3.5 billion and \$0.5 billion respectively.

## KEY POINTS TO REMEMBER: FARM SECTOR

The farm sector is assumed to own all animals, but incurs an opportunity cost of \$500 million.

The cattle industry purchases \$4.0 billion worth of inputs annually. The sheep industry purchases inputs valued at \$3.2 billion.

The cattle industry produces \$6.4 billion worth of outputs annually and the sheep industry produces \$3.0 billion worth of outputs. THE VALUE CHAIN FOR MEAT AND LIVESTOCK PRODUCTS SUMMARY

## **Operating Profit/Value Added**

Subtracting total costs from total income for the farm sector gives an annual profit (or value added) of \$2.0 billion for cattle and \$(220) million for sheep. Given that total industry value added equals \$3.0 billion (refer Section 2.3), the cattle farm sector contributes 67% and the sheep farm sector has a negative contribution of 7.3% respectively, of total industry value added.

### 2.2.2 The Feedlot Sector

### What is the Feedlot Sector?

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This sector represents the feedlots which form part of the Australian Meat and Livestock Industry. The growth in this sector has been in response to increased domestic consumer demand for lot-fed beef and, more importantly, increased export domand from the growing markets in the Western Pacific In 1991/92-93/94, the feedlot sector produced 14% of the quantity (in dressed weight terms) and 16% of the value of Australian peef.

### The Feedlot Sector and the Meat Industry : Links of Importance

Figure 4 illustrates how the feedlot sector is linked through the purchase of animals from the farm sector and through the sale of animals to the abattoir sector. Every year a proportion of animals sold from the farm sector enter feedlots where they are fathened for the domestic or export markets. The average price of fattened cattle between 1991/92 and 1993/94 is shown in Figure 4.



#### FIGURE 4 : THE FEEDLOT SECTOR AND THE VALUE CHAIN

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### Feedlot Sector Inputs

### Inputs Purchased from Other Sectors

Feedlots make use of one type of raw material - live animals which are purchased from cattle breeders throughout Australia. Feedlots purchase 800,000 cattle annually valued  $\epsilon t$  \$431 million.

### Inputs Purchased Externally

The feedlot sector also purchases materials and services required to fatten cattle. Materials and service costs included in the value chain cover grains, grain processing, roughage processing, veterinary expenses, labour and machinery costs, repairs and maintenance, as well as administration and overheads. The total cost of materials and services purchased annually is estimated to be \$246 million.

#### Products

Feedlots produce two major products: grain finished cattle for domestic and export markets, and manure. Manure is sold to processors outside the industry and is therefore treated as an external output. Cattle for both domestic and export markets are sold to domestic and export abattoirs. The total annual income is estimated to be \$730 million, about \$9 million of which is derived from manure sales. KEY POINTS TO REMEMBER: FEEDLOT SECTOR

Feedlots purchase \$431 million worth of cattle annually.

In finishing cattle, feedlots use \$246 million worth of purchased inputs, including grain.

Feedlots sell \$721 million worth of cattle to export and domestic abattoirs annually. They also sell about \$9 million worth of manure outside the Meat and Livestock Industry.

### Operating Profit/Value Added

The feedlot sector is estimated to earn an annual operating profit or value added of approximately \$53 million. The feedlot sector contributes 2% of the total industry value added.

### 2.2.3 The Abattoir Sector

#### What is the Abattoir Sector?

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The abattoir sector in the value chain model represents both domestic and export abattoirs. Most of these abattoirs process both sheep and cattle and a number also process pigs. The exceptions are the large northern beef export abattoirs and a small number of sheep-only abattoirs in southern and Western Australia. The value chain model uses separate estimates of the costs and returns for processing sheep and cattle. Sheep and cattle slaughtering are analysed as separate activities, even though they are often carried out in the same abattoir.

#### The Abattoir Sector and the Meat Industry : Links of Importance

Figure 5 illustrates how the abattoir sector is linked backwards through the purchase of animals from the farm and feedlot sectors, and forwards through meat sales to other industry sectors. Abattoirs purchase cattle and sheep which they convert into boneless meat, carcases, offal, skins/hides and other by-produces (e.g. dried blood, bone, tallow and meat meal). Most of the sheepmeat is sold in carcase form while beef is primarily sold as bone-in or bone-less cuts. Export works process meat primarily for export markets, although they also sell some meat domestically. Domestic abattoirs are regulated to only sell meat into the domestic market. Figure 5 shows the average mark-up (i.e. difference between purchase and sale price of meat) and the output price for meat sold from domestic and export abattoirs.

#### FIGURE 5 : THE ABATTOIR SECTOR AND THE VALUE CHAIN



## Abattoir Sector Inputs

### Inputs Purchased from Cther Sectors

Raw materials purchased by the abattoir sector include approximately 2.43 million tonnes (dressed weight) of livestock annually which equates to 8.1 million cattle and 33.2 million sheep slaughtered. The largest proportion of animals is purchased by export accredited works which buy about 1.69 million tonnes (dressed weight). Domestic abattoirs purchase 746,000 tonnes (dressed weight) annually. The total cost of purchased animals is estimated to te \$4.46 billion.

#### Inputs Purchased Externally

In addition to arimals, the abattoir sector purchases materials and services from sources outside the Meat and Livestock Industry. These inputs include: labour, packaging materials, electricity, water and transport. Abattoirs also pay meat inspection fees to the Australian Quarantine Inspection Service, levies to the Australian Meat and L vestock Corporation (AMLC) and Meat Research Corporation (MRC) for marketing and research respectively. Total annual expenditure on these materials and services is estimated to be \$1.66 billion. Export abattoirs spend \$1.28 billion on inputs.

#### Products

Abattoirs produce meat in various forms for sale to other meat processors, wholesalers, retailers and exporters. In addition, abattoirs sell cattle hides and sheep skins to tanneries for further processing. Total income earned from the sale of these products is \$6.31 billion annually, \$4.59 billion of which represents sales from export abattcirs. Sales of meat to the Other Meat Processing, retail wholesale and export sectors total \$5.49 billion.

## KEY POINTS TO REMEMBER: ABATTOIR SECTOR

The abattoir sector purchases the equivalent of 2.43 million tonnes (dressed weight) of livestock annually from the farm and feedlots sectors. This costs \$4.46 billion.

The abattoir sector uses \$1.66 billion worth of materials and services annually in converting animals to meat products.

Abattoir income totals \$6.31 billion annually, \$5.49 billion of which comes from the sale of meat to the Other Meat Processing sector, retailers, wholesalers and exporters.

## Operating Profit/Value Added

Subtracting total costs from the total income generated by the abattoi sector for both the cattle and sheep industries gives a total operating profit (or value added) of about \$183 million. The abattoir sector therefore contributes 6% of total industry value added.

## 2.2.4 Other Meat Processing (OMP)

## What is the OMP Sector?

Like the abattoir sector the OMF sector is classified in the group of businesses within the meat industry which are defined as processors. The OMP sector represents processors who produce:

- pet food;
- sausages;

- emulsified products (frankfurts, devon, etc.);
- hamburgers; and
- other meat products (canned meats; continental smallgoods; corned, salted and roasted beef; and meat pies).

## The OMP Sector and The Meat Industry : Links of Importance

Figure 6 illustrates how the OMF sector is linked through the purchase of meat and rendered byproducts (e.g. dried blood, meat meal, tallow, etc.) to the abattoir sector. The diagram also shows the average price and mark-up applied to the products sold. This price refers only to the meat component of OMP products.





### OMP Sector Inputs

#### Inputs Purchased from Cther Sectors

The OMP sector purchases the equivalent of 215,000 DWT tonnes of carcases, 9,000 tonnes of offal and 74,000 tonnes of by-products from the abattoir sector annually. The total cost of these raw materials is \$359 million, \$235 million of which is derived from bovine.

### Inputs Purchased Externally

The OMP sector uses materials and services purchased outside the Meat and Livestock Industry to convert meat and by-products into smallgoods, sausages, etc.. These inputs include labour, services, packaging. transport and overheads. The total annual expenditure on materials and services by the OMP sector is \$330 million, \$147 million of which is used to convert beef into a range of products. The remaining \$183 million covers the cost of materials and services used to convert mutton into processed goods.

### Products

The OMP sector produces numerous products which are sold directly to the public and through supermarkets. The total value of annual sales is estimated to be \$873 million, \$119 million of which is sold to supermarkets. Eleef-based products constitute \$477 million of the total sales, and sheepmeat-based products account for \$396 million.

## KEY POINTS TO REMEMBER: OMP SECTOR

Total raw material purchases by the OMP sector cost \$359 million, of which bovine products account for \$235 million and ovine products for \$125 million.

The OMP sector purchases \$330 million worth of inputs from sources external to the Meat and Livestock Industry.

The OMP sector sells \$873 million worth of meat-based products. Beef-based products account for \$477 million of total income and sheepmeat-based products account for \$396 million of sales.

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## Operating Profit/Value Added

Total operating profit in the OMP sector is estimated to be \$183 million, \$95 million of which is derived from the sale of beef-based products and \$88 million from the sale of sheepmeatbased products. Total contribution of the OMP sector to the industry value added is 6%.

## 2.2.5 The Tannery Sector

## What is the Tannery Sector?

The tannery sector purchases raw hides and skins from the abattoir sector in fresh or salted/dried form and converts them into semi-processed forms or finished leather. Hides and skins are the most important single by-product from the abattoir sector. They contribute more than 45% of the total by-product value from cattle slaughtering and 60% of the by-product value from sheep slaughtering.

## The Tannery Sector and the Meat Industry : Links of Importance

Figure 7 illustrates how the tannery sector is linked through the purchase of hides and skins to the abattoir sector. However, because the product of primary concern in the value chain model is meat, it is assumed that all hides and skins are sold by the tannery sector to businesses outside the Meat and Livestock Industry. Hence, all tannery outputs are considered to be external. Figure 7 also shows the average price of cattle hides and shoep skins sold from the tannery sector during the period 1991/92 to 1993/94.



### FIGURE 7 : THE TANNERY SECTOR AND THE VALUE CHAIN

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### Tannery Sector Inputs

#### Inputs Purchased from Other Sectors

The tannery sector purchases hides and skins from the abattoir sector. In total, 8.1 million cattle hides and 33.2 million sheep skins are purchased annually. The tannery sector pays \$358 million per annum for cattle hides and \$131 million per annum for sheep skins.

#### Inputs Purchased Externally

The tannery sector purchases materials and services from outside the industry for hides and skin processing. For both cattle and sheep these inputs include freight, chemicals, shipping, commission, selling costs, labour and overhead costs. In total \$.63 m llion is spent annually on cattle hide processing. The equivalent figure for sheep skin processing is \$120 million.

#### Products

The cattle industry produces four tannery sector outputs - wet blue hides, finished leather, salted calf skins and satted hides. All products are sold to businesses/consumers outside the Meat and Livestock Industry. They produce a total income of \$606 million per annum.

The sheep industry produces four tannery sector outputs - tanned skins with wool on, salted skins, dried skins and fellmongered skins (includes wool). Ali products are sold to businesses/consumers outside the industry and produce a total income of \$277 million per annum.

## KEY POINTS TO REMEMBER: TANNERY SECTOR

The tannery sector purchases 8.1 million cattle hides and 33.2 million sheep skins per year from abattoirs at a total cost of \$489 million.

The tannery sector purchases \$284 million worth of materials and services per year from sources external to the Meat and Livestock Industry.

The Cattle tannery sector produces four outputs which generate a total income of \$606 million per annum.

The Sheep tannery sector produces four outputs which generate a total income of \$277 million per annum.

## **Operating Profit/Value Added**

Total operating profit in the tannery sector is \$110 million per annum: \$85 million of which comes from the sale of cattle hides. In economic terms this means that the tannery sector adds \$85 million per annum in value to cattle hides and \$25 million per annum in value to sheep skins. The tannery sector accounts for 4% of the total industry value added.

2.2.6 The Wholesale Sector

### What is the Wholesale Sector?

Meat wholesalers provide links between abattoirs, food service outlets (such as restaurants and fast food outlets), supermarkets and butchers shops. The value chair model treats the wholesale sector as a buyer of meat from the abattoir sector. There is often no change in ownership between the three sectors because some wholesalers purchase livestock and process them through service abattoirs and other wholesalers have their own retail outlets. For beef, 90% of the value of wholesale turnover is boneless beef. About two-thirds of wholesale beef sales are to food service outlets. About 33% of the beef trade therefore consists of sales to retail butchers and supermarkets. Virtually all sheepmeat wholesaling consists of lamb carcases, most of which are sold to butchers and supermarkets.

### The Wholesale Sector and the Meat Industry : Links of Importance

Figure 8 shows how the wholesale sector is linked through the purchase of meat to the abattoir sector, and through the sale of meat to the retail sector (i.e. butche's and supermarkets). The diagram also displays the average mark-up and price applied to meat sold from the wholesale sector.



#### FIGURE 8 : THE WHOLESALE SECTOR AND THE VALUE CHAIN

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### Wholesale Sector Inputs

#### Inputs Purchased from Other Sectors

Beef wholesalers purchase the equivalent of 220,000 tonnes of carcases per annum. This costs \$583 million. Sheepmeat wholesalers purchase the equivalent of 88,000 tonnes of carcase meat from abattoirs which costs \$119 million per annum.

#### Inputs Purchased Externally

Materials and services brought in by wholesalers from outside the industry include freight, labour and packaging. The wholesale beef industry spends \$103 million on these inputs annually The wholesale sheep industry spends \$11 million on the same inputs.

#### Products

The beef wholesale sector sells five product groups - retail cuts (from boneless primals); boneless beef; carcases; offal; bones and fat. Sales generate \$710 million in income per annum, \$239 n illion of which comes from the sale of beef to butchers and supermarkets. The remaining beef is sold to food service outlets. The sheepmeat wholesale sector sells four product groups, boneless meat, carcases, offals, bones and fat. Sales generate \$150 million in income per annum, \$115 million of which is derived from the sale of sheepmeat to butchers and supermarkets.

## KEY POINTS TO REMEMBER: WHOLESALE SECTOR

Beef wholesalers' meat purchases cost \$583 million per year. Sheepmeat wholesalers' meat purchases cost \$119 million per year.

Beef wholesalers purchase \$103 million of inputs from sources external to the Meat and Livestock Industry. Sheepmeat wholesalers purchase inputs valued at \$11 million.

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Beef wholesalers sell five products which generate a total income of \$710 million per year. Sheep wholesalers sell four products which generate a total income of \$150 million per year.

## **Operating Profit/Value Added**

The wholesale sector earns an operating profit of \$44.2 million per annum and of this, beef wholesalers earn \$23.7 million. In economic terminology this means that beef wholesalers add a total of \$23.7 million in value to beef each year. Sheepmeat wholesalers add \$20.5 million in additional value. The wholesale sector contributes 1.5% of the total industry value added.

## 2.2.7 The Retail Sector

## What is the Retail Sector?

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The value chain model considers two parts of the retail sector - butchers and supermarkets. Butchers make up 60% of retail sales by value and 59% of sales by volume.

## The Retail Sector and the Meat Industry : Links of Importance

Figure 9 shows how the retail sector is linked to the Meat and Livestock Industry through retail purchases of meat from abattoirs, wholesalers and Other Meat Processors. This figure also indicates the average prices and mark-ups applied to meat sold to consumers by butchers and supermarkets.

FIGURE 9 : THE RETAIL SECTOR AND THE VALUE CHAIN



## Retail Sector Inputs

## Inputs Purchased from Other Sectors

The retail sector in the beef and sheep industries purchases boneless meat, carcases, offal and sausages. The beef industry purchases the equivalent of about 436,000 tonnes of carcases costing \$1.22 billion per annum. The sheep industry purchases the equivalent of 253,000 tonnes of carcases costing \$436 million per annum.

### Inputs Purchased Externally

Butchers and supermarkets purchase materials and services from outside the Meat and Livestock Industry. These inputs include labour, shop rental and packaging materials, etc.. Beef retailers spend approximately \$1.13 billion per annum on these inputs. Sheepmeat retailers spend \$675 million per year on these same inputs.

### Products

The retail sector produces four main products retail meat cuts, sausages, mince and offal. Bones and fat are also sold if retailers process carcases. Income for beef-based products totals \$2.61 billion and \$1.29 billion per year for sheepmeat-basec products.

### Operating Profit/Value Added

The retail sector earns an operating profit of about \$433 million per annum including \$255 million through the sale of beef-based products. In economic terms this means that retailers add \$255 million per year in value to beef and \$178 million per year to sheepment. These figures indicate that the retail sector accounts for 14% of the total industry value added.

## KEY POINTS TO REMEMBER: RETAIL SECTOR

Butchers and Supermarkets purchase four types of meat. Beef purchases cost \$1.22 billion per year. Sheepmeat purchases cost \$436 million per year.

Butchers and Supermarkets purchase materials and services from sources external to the Meat and Livestock Industry which are valued at \$1.81 billion per year.

Butchers and Supermarkets produce four main types of meat for sale to consumers. These products generate a total income of \$3.90 billion per year.

## 2.2.8 The Export Sector

### What is the Export Sector?

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The export sector, as defined in the value chain, represents meat and livestock exports. Their is often no change in ownership between the export and abattoir sectors. Exports of hides, skins, dairy products and other meat by-products are not included.

### The Export Sector and the Meat Industry : Links of Importance

Figure 10 illustrates how the export sector is linked, through the purchase of meat and live animals, to the farm and abatteir sectors. All export meat originates from abatteirs with export accreditation. Figure 10 also shows the average mark-up and price applied to meat sold by the export sector.



## FIGURE 10 : THE EXPORT SECTOR AND THE VALUE CHAIN

## Export Sector Inputs

### Inputs Purchased from Other Sectors

The export sector purchases meat and live animals from the abatto:r and farm sectors. In total, the equivalent of 1.105,000 tonnes of beef carcases, 300,000 tormes of sheep carcases and 68,000 tonnes of offal are exported annually. The cost of these products to exporters is S3.40 billion, \$2.84 billion of which consists of beef. Live animal export includes 193,000 head of cattle costing \$73 million and 4.8 millior sheep costing \$80 million.

#### Inputs Purchased Externally

The export sector purchases materials and services from outside the Meat and Livestock Industry. These inputs include freight, feed, quarantine costs, and commission for export agents. The total cost of these inputs per year is \$387 million. Of this total, inputs required for beef export cost \$172 million.

### Products

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The export sector exports the same type and quantity of mear and live animals as it purchases. Income from the export of beef, sheepmeat and live animals totals \$4.03 billion per year. This breaks down to include about \$3.14 billion for beef, \$131 million for live cattle, \$467 million for sheepmeat, and \$293 million for live sheep. All outputs are external, moving directly to consumers outside the value chain.

## KEY POINTS TO REMEMBER: EXPORT SECTOR

The export sector purchases meat worth \$3.40 billion and live animals (for export) valued at \$153 million annually.

The export sector utilises inputs purchased from sources external to the Meat and Livestock Industry. These inputs cost \$387 million annually.

The export sector sells beef, sheepmeat, live cattle and live sheep for a total income of \$4.03 billion annually.

### Operating Profit/Value Added

The export sector generates a total operating profit of \$249 million per year of which \$187 million is generated by sales of beef and live cattle. This means that the export sector adds \$187 million to the value of beef and live cattle, and \$62 million to the value of sheepmeat and live sheep per year. The export sector adds approximately 8% to the total industry value added.

## 2.3 A TABULAR SUMMARY OF THE VALUE CHAIN

Table 1 shows the value chain's estimates of the total value of inputs, outputs and value added for each sector within the Meat and Livestock Industry. The table is a summary of the information presented in the preceding sections. Reference to the shaded portion of Table 1 shows that the total income from the farm sector through sales to the feedlot, abattoir and export sectors is \$4.33 billion. The farm sector also sells milk and wool to processors outside the industry. These external outputs generate \$5.04 billion in income. Fotal annual income for the farm sector is therefore \$9.36 billion. The farm sector does not purchase raw materials from other sectors, but requires \$7.58 billion (including \$494 million in opportunity cost) worth of inputs which are purchased from external sources. Total costs are therefore \$7.58 million. When total costs are subtracted from total income, the farm sector generates an operating profit (or value added) of \$1.79 billion per year. The value added by the feedlot, abattoir, OMP, tannery, wholesale, retail and export sectors has been similarly calculated.

Apart from summarising values for each sector. Table 1 also details the total value added for the Meat and Livestock Industry. This is \$3,040 million per year. Given that the average Australian Gross Domestic Product (national net income or national value added) was \$395,889 million between 1991 and 1994, the Meat and Livestock Industry contributes approximately 1% of the national value added.

|                    | INPUTS TO (\$ MILLION) |         |         |     |         |           |       |       | TOTAL TO |                             |         |
|--------------------|------------------------|---------|---------|-----|---------|-----------|-------|-------|----------|-----------------------------|---------|
| CUTPUTS FROM       | . ,                    |         |         |     |         |           |       |       |          | EXTERNAL                    | TOTAL   |
| (SMLUON)           | FARM                   | FEEDLOT | ABATTOR | CVP | TANNERY | WHOLESALE | RETAL | EPORT | SECTOPS  | CUTFUTS                     | CUTPUTS |
| FARM               | 0                      | 431     | 3741    | 0   | 0       | 0         | 0     | 153   | . 4326   | 5035                        | 9360    |
| FEEDLOT            | 0                      | 0       | 721     | 0   | 0       | 0         | 0     | 0     | 721      | 9                           | 730     |
| ABATTOR            | 0                      | 0       | Q       | 347 | 489     | 702       | 1197  | 3243  | 5977     | 331                         | 6309    |
| ave                | 0                      | C       | 0       | 0   | 0       | 0         | 119   | c     | 119      | 754                         | 873     |
| TANNERY            | 0                      | 0       | C       | 0   | 0       | 0         | 0     | C     | C        | 883                         | 883     |
| WHOLESALE          | C                      | 0       | 0       | 13  | C       | 0         | 341   | C     | .354     | 506                         | 850     |
| RETAIL             | С                      | C       | 0       | 0   | 0       | 0         | 0     | C     | c c      | 3896                        | 3896    |
| EXPORT             | 0                      | 0       | C       | C   | 0       | 0         | 0     | C     | C        | 4031                        | 4031    |
| TOTAL FROM         |                        |         |         |     |         |           |       | 1     |          |                             |         |
| OTHER SECTORS      | C                      | 431     | 4463    | 360 | 489     | 702       | 1657  | 3396  | 11496    | 15445                       | 26941   |
| EXTERNAL INPUTS a/ | 7575                   | 246     | 1664    | 330 | 284     | 114       | 1806  | 387   | 12405    | + NOLLOES OPPORTUNITY OF ST |         |
| TOTALINPUTS        | 7575                   | 678     | 6126    | 669 | 772     | 816       | 3463  | 3782  | 23902    | OF HEPDANDROCK              |         |
| VALUE ADDED        | 1785                   | 53      | 183     | 183 | 110     | 44        | 433   | 249   | 3040     | 1                           |         |

## TABLE 1 : THE VALUE CHAIN IN SUMMARY

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THE VALUE CHAIN FOR MEAT AND LIVESTOCK PRODUCTS SUMMARY

## 2.4 USES OF THE VALUE CHAIN

The value chain was included in the RADIS study as one of a group of modelling techniques for Meat and Livestock Industry analysis. The value chain can be utilised in two ways.

First, as a physical and financial description of the industry, the value chain provides an overview of all activities and products within the industry. Prior to RADIS, such a description was not available for any complex industry in Australia in the level of detail provided by the value chain model. The model is descriptive and can serve as a reference source which highlights the basic structure and characteristics of the Australian Meat and Livestock Industry.

Its second major use is as a research or analytical tool. It complements other models, because the industry has been dissected into detailed sectors and subsectors. It is capable of analysing the effect on the industry of changes which are imposed or generated externally.

"What if" questions can be asked to assess the impact of various events. The type of "what if" questions asked depends on which industry sector is under consideration. In the farm sector, productivity is of major interest (i.e. the number of animals that can be produced at a given cost). Elsewhere within the model it is more relevant to assess the impact of changes in costs and prices, since the amount of meat flowing through the sectors is determined by output from the farm sector. For example, if it is possible to increase farm turnoff by, say, 10%, this increase will flow through the industry to increase the amount of meat available domestically and for export. It will also result in an increase in feedlot throughput and hide and skin production. However, in the abattoir, wholesale, OMP, retail and export sectors the increased throughput of meat will raise some (but not all) costs and will increase total income. The degree to which incomes increase relative to costs will determine the resulting level of profit in each sector. Similarly, it is possible to increase product prices in, say, the wholesale sector to determine what effect the increase will have on costs and profitability in the retail sector, which purchases wholesale meat.

In all cases it is important to consider not only the initial impact of a change in numerical terms, but also the constraints to its achievement, the probability of success, the likely rate of adoption, and the time taken for the results to flow through all the sectors of the industry. This requires judgements based on a thorough understanding of the Meat and Livestock Industry.

## 1. BACKGROUND

The value chain model described in this report was developed under the Meat Research Corporation's Research and Development Investment Study (RADIS) to help identify areas for R&D which would provide the best returns to the Meat and Livestock Industry. Although RADIS has been completed, the value chain model will be periodically updated for use as a reference base for the physical and financial flows throughout the Meat and Livestock Industry, and between the industry and the consumers of meat and meat by-products.

The last version of the value chain model was presented in a report dated April 1993 and included data averaged over 1987/88, 88/89 and 39/90. Figures 1a and 1b detail physical flows (in dress weight equivalents) of meat through the beef and sheep value chains, differences in base sources of information are noted in these figures. Major modifications to the earlier model which are incorporated in this report include:-

- (i) The model has been updated using average data for 1991/92 through to 1993/94 period.
- (ii) In the farm sector an opportunity cost has been placed on the value of the livestock and the resource base. The opportunity cost measures the income that could have been earnt had the herd and flock been sold and the money placed in long term investments. For this update an interest rate of 5% was used.
- (iii) Standardisation of units to \$/kg DWT has been achieved throughout the model except in the tannery sector where it proved very difficult to report costs other than \$/hide or \$ per square metre.
- (iv) This update separates out costs associated with the by-product industries of dairying and wool production. The beef model separates costs into beef production and dairy production and allocates a weighted percentage based on overall numbers of the various types. Similarly with the sheep industry, prime lamb production and wool production have been separated out.
- The model has been altered to incorporate the live export cattle trade. It was necessary to do this as the type of animal being live exported differed greatly in weight and price from those destined for the abattoir.
- (vi) Changes in base sources of information have been noted in figures 1a and 1b and also in Annex 4. Where possible the latest research undertaken by MRC combined with the AACM network has been used to update the model.

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 (vii) Between 1991/92 and 1993/94, there have been several alterations in the Australian Standard Geographical Classification (ASGC) system by the ABS to code Statistical Local Areas (SLA's). While most had no impact on the regions used in this study there was one change to note.

> 1) South Australia - Truro (DC) was codec as 420057840 in 1991-92 and included in Region 5. In 1993-94, Truro was combined with Ridley (previously included in Region. 4) as Ridley-Truro (ASGC code now 510050630). Ridley-Truro was placed in Region 4.

(viii) Australian Bureau of Statistics export data has changed to a FOB basis, (previously CIF), it has been necessary to change costs ssociated with exporting of meat to exclude shipping and insurance costs.

The end result is a model which is not fundamentally different from earlier versions, but which presents a more typical picture of product and money flows. The model is a reference source on the Meat and Livestock Industry and can be utilised as an effective tool for R&D planning.

## FIGURE 1a : MEAT FLOWS AND INFORMATION SOURCES IN THE CATTLE VALUE CHAIN



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### FIGURE 1b : MEAT FLOWS AND INFORMATION SOURCES IN THE SHEEP VALUE CHAIN

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## 2. A GUIDE TO USING THE VALUE CHAIN AND UNDERSTANDING ITS RESULTS

## 2.1 GENERAL APPROACH

The value chain is a computerised model which was constructed specifically to illustrate the product and financial flows which occur throughout the Australian Meat and Livestock Industry. It provides a complete account of physical (i.e. inputs and outputs) and financial flows through the industry, and between the industry and its surrounding environment (i.e. product consumers and input sources).

The model was designed using spreadsheet software. This has two identifiable benefits. Firstly, the model can be continually updated to serve as a reasonably accurate industry information bank. Secondly, "what if" questions can be asked about the effects of productivity-related and price changes within the industry. In other words, the model can be used to conduct sensitivity studies about the effect on the industry of specific changes in farm level productivity, at attoir costs, etc. When using the model and interpreting its results the following points are relevant:-

- (i) Effective use of the value chain and its numerical results requires an understanding of the Meat and Livestock Industry. If the model is used as a reference source, readers should consider the structure and characteristics of the industry. For example, the updated model shows that in total, farms earn an operating profit of \$1.8 billion per year. However, there are numerous cattle and sheep producers and some earn far more than others. Use of the value chain for research requires an appreciation of not only the structure of the industry, but also the attitudes of producers, processors, and retailers, and other non-numerical factors which influence the success and impact of research and development.
- (ii) The value chain model provides a detailed evaluation of the ways through which meat moves from farmers to consumers, and the ways in which money moves from consumers back to farmers.
- (iii) The model is based on product flows through the Meat and Livestock Industry. The value chain specifies product-related information for each sector of the industry including farms, feedlots, abattoirs, tanneries, wholesalers, retailers and exporters.
- (iv) The chain is, in reality, a network of chains with linkages to the external environment.
- (v) At each stage in the chain, the model specifies physical information including:-

- the stage of product conversion or transformation from live animals through to consumer products;
- the nature and quantity of products brought forward from previous stage(s);
- materials and services brought into the chain from external sources (e.g. labour, packing materials, transport services, energy); and
- the nature and quantity of products passed forward to the next stage in the chain, to consumers outside the Meat and Livestock Industry.
- (vi) At each stage in the chain the model specifies financial information including:-
  - the value of products brought forward from the previous stage;
  - the cost of materials and services purchased from outside the chain;
  - income accruing at each stage from sales of products to other sectors within the Meat and Livestock Industry, or sales of products to entities outside the chain; and
  - transport, storage and handling costs incurred in moving products between stages.

### 2.2 MODEL DESCRIPTION

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The value chain model is a computerised spreadsheet model which describes and determines the quantity of all inputs, product transformations, outputs and operating profits (value added) for the industry over a 12-month period. An overview of the model is provided in Figure 2 which illustrates in detail all product and physical and financial flows throughout the industry. The model's main features are:-

- (i) It provides an image of the structure of the Meat and Livestock Industry during a specific period. The model was based on data averaged over the 1991/92, 1992/93 and 1993/94 financial years.
- (ii) A "synthetic" approach was used to construct the model. Due to the shortage or, in some cases, almost complete absence of data for some industry sectors, it was necessary to "synthesise" budgets based on expert assessment of "typical" or "representative" producers, processors and/or retailers. Where there is a considerable amount of diversity within a sector, the sector was divided into subsectors and a budget prepared for each subsector. In all cases the budgets were verified by cross-checking total costs, incomes and profits (value added) with available industry information.





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- (iii) The model is not "user-friendly" and cannot be used easily by people who are not familiar with its structure and with spreadsheet software.
- (iv) Any unit cost or price within the model can be varied, and these changes flow through the model instantaneously. The model does not reflect the time taken for industry adjustment to a particular change. It only shows the final position after changes in, for example, costs, revenues or productivity, have passed through all sectors of the industry.
- (v) Individual assessment can be used to make judgements about whether such changes will be quick or slow to take effect, and to identify and assess restrictions to change. In this way a clearer picture of the industry's likely response to changes, is obtained. This applies to changes generated externally (e.g. an increase in labour costs), or internally, (e.g. an increase in cattle or sheep turnoff).
- (vi) The model does not show the effect of changing production levels on prices, or the effect of price and cost changes on production.
- (vii) The cattle model consists of eight sectors the Farm, Feedlot, Abattoir, Other Meat Processing (OMP), Tannery, Wholesale, Retail and Export sectors. Each sector, (excluding OMP, Tannery and Wholesale), is divided into two or more subsectors. The sheep model does not include a feedlot sector.

The farm sector is the only sector which is broken-down by regions. For all other sectors, regional differences were not sufficient to warrant disaggregation. The farm regions are based on 15 aggregations of ABARE's Agricultural and Grazing Industry Survey Regions and the Meat Research Corporation's distinction between northern and southern Australia. The farm sector has also been further broken into specialist beef production in the cattle model and prime lamb production in the sheep model.

The feedlot and abattoir sectors are disaggregated into two subsectors based on export and domestic operations.

The retail sector is disaggregated into butcher and supermarket subsectors. It was originally considered that the restaurant/fast food industry should also form a further subsector. However, it was impossible to measure the costs, incomes and profits or value added to the meat used in this subsector. Accordingly, restaurants and fast food outlets are treated as an "end-users" and products flowing into this industry are treated as external outputs from wholesalers.

The export sector is disaggregated into two subsectors based on meat exports and live exports.

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In the remaining three sectors, (feedlots, tanneries and other meat processors), operational differences were not sufficiently large to warrant disaggregation.

- (viii) To make the value chain easy to follow. inputs used and products produced are defined in two different ways. Inputs used by each sector (i.e. farm, feedlot, etc.) can either be purchased from another sector within the industry (e.g. cattle are purchased by feedlots from farms) or they can be purchased from "outside" the industry (e.g. labour, transport, animal feed, services, interest, etc.). Similarly, products from one sector can either be sold to another sector for further processing or they are sold to consumers. The differences between inputs and outputs are clearly detailed throughout the value chains:-
  - Inputs purchased from "outside" the industry are called external inputs.
  - Products sold to consumers "outside" the industry are called external outputs.

For example, inputs which the abattoir sector obtains from farms or feedlots (i.e. livestock) fall under the heading of inputs from other sectors. However, inputs purchased from "outside" the industry fall under the heading of external inputs. This classification, makes it possible to follow the flow of meat and by-products from sector to sector, and eventually to consumers.

The associated costs and incomes can also be external. This means that external inputs and external outputs are purchased from or sold to the external environment (i.e. businesses/consumers outside the bounds of the Meat and Livestock Industry).

- (ix) Figure 2 illustrates the flow of physical products between sectors and subsectors. It also shows industry linkages with industries/consumers outside the Meat and Livestock Industry.
- (x) Prices used in the model reflect "gross prices", not net prices. Marketing costs (such as commission, packaging, freight and cartage, insurance, handling, etc.) are included as external costs whether deducted by a marketing agency or authority prior to payment to the business, or paid directly by the business. For example, farmers may have to pay for the transport of livestock. This cost is usually deducted from the amount paid by the abattoir for livestock. Hence, farmers receive the price of livestock (as paid by abattoirs) net of transport costs. However, in the value chain it has been assumed that farmers receive full payment for livestock and then pay the transport operator.

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- (xi) All values are expressed as an average between current 1991/92, 1992/93 and 1993/94 prices.
- (xii) The following definitions are used in the model:-
  - An "Industry" includes the sheep industry, the cattle industry or the entire Meat and Livestock Industry, including sheep and cattle and all production, processing and marketing activities.
  - A "Sector' is a discrete component within the industry and is specified in terms of an "activity". There may be changes of product ownership within a sector, or product ownership may span a number of activities in several sectors.
  - A "Subsector" is the lowest level of disaggregation in the model. A sector is divided into subsectors (e.g. retailing is divided into the butcher and supermarket subsectors).
  - "Value-Added" is defined as the difference between total income and total cost of production. Value-added is equivalent to operating profit in industries where ownership is separated from labour. In the farm sector where owner-operators predominate, value-added includes both profit and return to owner-operators' labour input.
  - "Product Conversion Factors" describe the physical transformations in the model of, for example, livestock to meat. These transformations are described in the form of ratios (e.g. turnoff %, carcase yield, retail weight per kg cf carcase weight, etc.) and are listed in Annexes 6 (Cattle) and 7 (Sheep).
  - "Operating Costs" are costs directly attributable to a particular activity and vary in proportion to the level of production (e.g. packaging materials in an abattoir).
  - "Fixed Costs" or "Overheads" do not vary in proportion to the level of production or throughput.
  - The "Gross Margin" from a particular activity is the gross income less operating costs. Value added or operating profit is different in that it is calculated by subtracting operating and fixed costs from total income.
- (xiv) The model describes 15 "internal" outputs from the cattle industry and 11
  "internal" outputs from the sheep industry. These outputs move between
  sectors and subsectors within the two industries. It also describes 17
  "external" outputs from the cattle industry and 15 "external" outputs

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from the sheep industry. These outputs move from the sectors and subsectors within the two industries to consumers. Tables 2 and 4 contain complete output lists for the cattle and sheep industries, respectively. These outputs are, in most cases, groups of similar products aggregated together. In modelling an industry of such complexity, it is difficult and possibly misleading to designate particular items as either products or by-products, the implication being that the latter are in some way not important. The model therefore follows all products (except milk and wool) as far as possible down the production-processing-marketing pipeline.

#### 2.3 DATA SOURCES

Data used to construct the value chain were obtained from a wide variety of sources. In many areas the available data was insufficient to create a clear picture of a sector within the industry, and it was necessary to complete special studies. These studies were conducted by specialists with a detailed knowledge of particular sectors. A listing of the main data sources used to construct the value chain model is provided in Annex 4.

### 3. OVERVIEW OF THE CATTLE AND SHEEP INDUSTRIES

#### 3.1 INDUSTRY SECTORS AND SUBSECTORS

The value chain model dissects the cattle and sheep industries into eight sectors and 28 subsectors:-

- (i) Farm includes all primary production activities up to the farm gate plus transport of livestock from farm gate to subsequent sectors in the Meat and Livestock Industry. The cattle farm sector includes two main subsectors (north and south), 15 regional subsectors, and treats beef cattle and dairy cattle and their products separately. The sheep farm sector is intentionally not divided into northern and southern subsectors because most of the industry is in the south. However, the sheep farm sector is disaggregated into 15 regional subsectors.
- (ii) Feedlot includes two subsectors, one for domestic trade cattle and the other for heavier export cattle. There is no sheep feedlot subsector in the model.
- (iii) Abattoir includes all cattle and sheep slaughtering, meat packing and by-product production. There are two subsectors in the cattle model, one for beef export abattoirs, and one for domestic beef/sheep abattoirs. The sheep model includes two abattoir types; one for domestic lamb carcases and one for export operations.
- (iv) Other Meat Processing (OMP) includes production of sausages, smallgoods, pet foods, canned meat, hamburgers, meat pies and corned/ salted beef.
- (v) Tannery includes production of semi-processed (wet blue) hides, finished bovine leathers, salted calf skins, tanned wool - on sheep and lamb skins, and other raw sheep skin products. Packing raw hides and skins for export is included in the tannery sector.
- (vi) Wholesale includes distribution of carcase beef and lamb from domestic abattoirs to butchers, supermarkets and the food service sector (i.e. restaurants, take-away food shops, institutions etc).
- (vii) **Retail** -: ncludes butcher shops and supermarkets.
- (viii) **Export** includes live animal exports and the export of beef and sheepments.

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The two primary production sectors (farm and feedlot) are analysed in more detail in Section 4 of this report; the processing sectors (abattoir, OMP and tannery) in Section 5; and the marketing sectors (wholesale, retail and export) in Section 6.

#### 3.2 FINANCIAL SUMMARY

#### 3.2.1 The Cattle Industry

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Table 1 and Figure 3 show the value chain estimates of the total magnitude of inputs, outputs and value added in dollar terms for each sector of the cattle/beef industry. For example, the farm sector is shown as selling produce to the feedlot, abattoir and export sectors. The total income generated from these sales is \$3.72 billion. The farm sector also sells milk and wool to processors outside the industry. These sales generate \$2.66 billion in income. Total income is \$6.38 billion. In raising animals the farm sector is allocated and opportunity cost of \$412 million and requires \$3.96 billion worth of inputs purchased from sources external to the industry (e.g. labour, water, electricity, etc.). Total costs are, therefore, \$4,370 million. When total costs are subtracted from total income, the farm sector generates a total operating profit or value added of \$2.01 billion per year.

| · .                          |                        | •.•        | ·           | INPUTS  | TO (S MIL | LICN)      |        |        | TOTAL TO  |          | : · · · |
|------------------------------|------------------------|------------|-------------|---------|-----------|------------|--------|--------|-----------|----------|---------|
| OUTPUTS FROM .               |                        | ••• .      |             |         |           |            |        | · ·    | OTHER     | EXTERNAL | TOTAL   |
| (S MILLION)                  | FARM                   | FEEDLOT    | ABATIOIR    | OMP     | TANNERY   | WHOLESALE  | RETAIL | EXPORT | SECTORS . | OUTPUTS  | OUTPUTS |
| · · ·                        |                        |            |             |         |           |            |        |        | _·        |          |         |
| FARM                         | ٥                      | 431        | 3215        | 0       | o         | с          | 0      | 73     | 3720      | 2662     | 6362    |
| FEEDLOT                      | 0                      | 0          | 721         | ٥       | 0         | 0          | 0      | o      | 721       | 9        | 730     |
| ABATIOIR                     | 0                      | 0          | 0           | 234     | 358       | 583        | 917    | 3837   | 4929      | 285      | 5214    |
| OMP .                        | 0                      | 0          | ა           | G       | 0         | o          | 65     | 0      | 65        | 411      | 477     |
| TANNERY                      | υ                      | 0          | 0           | 0       | 0         | 0          | 0      | 0      | 0         | 606      | 606     |
| WHOLESALE                    | 0                      | 0          | .)          | 1       | n         | ç          | 238    | 0      | 239       | 470      | 710     |
| RETAIL                       | 0                      | 0          | o           | 0       | 0         | 0          | 0      | 0      | · 0       | 2607     | 2607    |
| EXPORT                       | O                      | 0          | Ð           | 0       | . 0       | 0          | _ 0    | 0      | 0         | 3269     | 3269    |
| TOTAL. FROM<br>OTHER SECTORS | 0                      | 431        | 3937        | 235     | 358       | 583        | 1221   | 2910   | 9675      | 10320    | 19995   |
| EXTERNAL<br>INPUTS a/        | 4370                   | 246        | 1271        | 147     | 163       | 103        | 1131   | 172    | 7504      |          | L       |
| TOTAL INPUTS                 | 4370                   | 678        | 5208        | 382     | 521       | <b>585</b> | 2352   | 3082   | 17278     |          |         |
| VALUE ADDED                  | 2012                   | . 53       | 6           | 95      | 85        | 24         | 255    | 187    | 2717      |          |         |
|                              | 100 - 100<br>100 - 100 | a/ INCLUDE | S- OPPORTUN | ITY COS | T OF HERD |            | ·      |        |           |          | 8197    |

| TABLE 1 | : | CATTLE: | INPUTS, | OUTPUTS  | AND | VALUE | ADDED |
|---------|---|---------|---------|----------|-----|-------|-------|
|         |   |         | (\$ m   | nillion) |     |       |       |

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|  |                   | Total Cattle<br><u>\$ million</u> | Excludio<br><u>\$ millior</u> | ng Dairy<br>1 |
|--|-------------------|-----------------------------------|-------------------------------|---------------|
| Value of outputs to other sectors<br>Value of external outputs<br>Total outputs from cattle industry | (A)<br>(B)<br>(C) | 3,720<br><u>2.662</u><br>6,382    | 3,486<br>0<br>3,486           |               |
| Value of inputs from other sectors /a<br>Value of external inputs<br>Total inputs to cattle industry | (D)<br>(E)<br>(F) | 412<br><u>3.957</u><br>4,370      | <u>2.900</u><br>3,235         | 334           |
| Value added (C - F) or (B - E)<br>(Operating Profit)<br>/a Opportunity cost of herd                  |                   | 2.012                             | -                             | 251           |

Each sector's contribution to total value added is estimated as follows:-

| Sector    | Value Added<br>(\$ m) | % of<br><u>Total</u> | \$ per Head<br>of Cattle | \$ per Head<br><u>Turned Off</u> |
|-----------|-----------------------|----------------------|--------------------------|----------------------------------|
| Farm      | 2012                  | 74.1                 | 33.36                    | 243.61                           |
| Feedlot   | 53                    | 2.0                  | 2.18                     | 6.41                             |
| Abattoir  | 6                     | 0.2                  | 0.25                     | 0.73                             |
| OMP       | 95                    | 3.5                  | 3.94                     | 11.50                            |
| Tannery   | 85                    | 3.1                  | 3.53                     | 10.29                            |
| Wholesale | 24                    | 0.9                  | 0.99                     | 2.91 .                           |
| Retail    | 255                   | 9.4                  | 10.56                    | 30.88                            |
| Export    | 187                   | 6.9                  | 7.75                     | 22.64                            |
| Total     | 2,717                 | 100.1                | 112.56                   | 328.97                           |

The **external costs** (i.e. costs of materials and services purchased from sources outside the industry) incurred in each sector are estimated as follows:-

| :         | External | % of<br>Total | \$ per            | \$ per<br>Head | % of        |
|-----------|----------|---------------|-------------------|----------------|-------------|
| Santon    | Costs    | Industry      | Head of<br>Cottle | Turned         | Costs Which |
| Dector    |          | 00565         | Cathle            |                | ME DAGINA   |
| Farm      | 3,957    | 55.0          | 163.94            | 479.11         | 90.5        |
| Feedlot   | 246      | 3.4           | 10.21             | 29.79          | 36.3        |
| Abattoir  | 1,271    | 17.7          | 52.67             | 153.89         | 24.4        |
| OMP       | 147      | 2.0           | 6.10              | 17.80          | 38.5        |
| Tannery   | 163      | 2.3           | 6.77              | 19.74          | 31.3        |
| Wholesale | 103      | 1.4           | 4.27              | 12.47          | 15.0        |
| Retail    | 1,131    | 15.7          | 46.85             | 136.94         | 48.1        |
| Export    | 172      | _2.4          | 7.14              | 20.83          | 5.6         |
| Total     | 7,191    | 99.9          | 297.91            | 870.69         | 41.6        |
|           |          |               |                   |                |             |

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The previous table indicates that the main movement of funds out of the cattle industry occurs in the farm, abattoir and retail sectors. A cost reduction thrust should focus on areas with large absolute external costs, and on sectors which have a high percentage of external costs. The latter include the farm, feedlot, OMP, tannery and retail sectors. Conversely the wholesale and export sectors obtain most of their inputs from within the industry and it would be more difficult to reduce costs without reducing revenue in the sectors which supply these inputs.

The **external incomes** from sales to consumers outside the Meat and Livestock Industry, generated by each sector within the cattle industry are estimated to be as follows:-

| Sector             | External<br>Income<br>_(\$ rn) | % of<br>Total<br>Industry<br><u>Income</u> | \$ per<br>Head of<br><u>Cattle</u> | \$ per<br>Head Turned<br>Off | % of<br>Income<br>Which is<br><u>External</u> |
|--------------------|--------------------------------|--|------------------------------------|------------------------------|---|
| Farm (incl. milk)  | 2,662                          | 25.8                                       | 110.28                             | 322.32                       | 41.7  |
| Farm (excl. milk)  | -                              | -  | -                                  | · _                          | -   |
| Feedlet            | 9                              | 0.1  | 0.37                               | 1.09                         | 1.2   |
| Abattoir           | 285                            | 2.8  | 11.81                              | 34.51                        | 5.5   |
| OMP                | 411                            | 4.0  | 17.03                              | 49.76                        | 86.2  |
| Tannery            | 606                            | 5.9  | 25.11                              | 73.37                        | 100.0   |
| Wholesale          | 470                            | 4.6  | 19.47                              | 56.91                        | 66.9  |
| Retail             | 2,607                          | 25.3                                       | 108.00                             | 315.66                       | 100.0   |
| Export             | <u>3,269</u>                   | 31.7                                       | <u>135.43</u>                      | <u>395.81</u>                | <u>100.0</u>                                  |
| Total (incl. milk) | 1.0,320                        | 100.2                                      | 427.52                             | 1,249.55                     | 51.6  |
| Total (excl. milk) | 7,658                          | 74.2                                       | 317.25                             | 927.23                       |   |

All of the external income generated from the cattle farm sector comes from milk sales. All other external income emerges further down the value chain when products are sold out of the industry. The above figures do not necessarily indicate the sectors which have the most to gain from increased incomes because increased production or prices in one sector can flow through to generate increased incomes further down the chain.

The contribution by different products to the total external revenue of the cattle industry is shown in Table 2.

| Product Category :          | Source<br>Sector | External<br>Revenue (\$ m) | <pre>% of Total<br/>Revenue</pre> | <pre>\$ pe.: Head     of Cattle</pre> | \$ per Head<br>Turned Off |
|-----------------------------|------------------|----------------------------|-----------------------------------|---------------------------------------|---------------------------|
| Milk .                      | Farm             | 2,662                      | 25.8                              | 110.3                                 | 322.3                     |
| Boneless Beef               | Export/Wholesale | 2,595                      | 25.2                              | 107.5                                 | 314.2                     |
| Retail Beef Cuts            | Retail           | 2,172                      | 21.1                              | 90.0                                  | 263.0                     |
| Sausages, Mince, Smallgoods | Retail/OMP       | 683                        | 6.6                               | 28.3                                  | 82.7                      |
| Export Beef Carcases        | Export           | 521                        | 5.1                               | 21.6                                  | 63.1                      |
| Other Recail Meats          | Wholesale        | 350                        | 3.4                               | 14.5                                  | 42.4                      |
| Rendered By-products        | Abattoir         | 285                        | 2.8                               | 11.9                                  | 34.5                      |
| Finished Leather            | Tannery          | 252                        | 2.4                               | 10.4                                  | 30.5                      |
| Salted Hides and Skins      | Tannery          | 197                        | 1.9                               | 8.2                                   | 23.9                      |
| Wet Blue Hides              | Tannery          | 158                        | 1.5                               | 6.5                                   | 19.1                      |
| Pet Food                    | OMP              | 156                        | 1.5                               | 6.5                                   | 18.9                      |
| Export Offals               | Export           | 143                        | 1.4.                              | 5.2                                   | 17.3                      |
| Live Cattle                 | Export           | 131                        | 1.3                               | 5.4                                   | 15.9                      |
| Manure                      | Feedlot          | 9                          | 0.1                               | 11 . J                                | 1.1                       |
| Retail Offals               | Wholesale/Retail | 7                          | 0.1                               | 0.3                                   | 0.8                       |
| Bones & Fat                 | Wholesale/Retail | :                          | 9.0                               | 0.ÿ                                   | 0.1                       |
| Total (including Milk)      |                  | 10,320                     | 100.2                             | (27.5                                 | 1,249.6                   |

# TABLE 2 : CATTLE INDUSTRY : INCOME GENERATED BY EACHPRODUCT a/

a/ Totals may not add exactly due to rounding.

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Table 2 highlights the importance of milk to the cattle farm sector with 26% of external revenue contributed from 10% of the total cattle herd. Retail beef cuts and meat exports comprise 46% of the value of product flows from the cattle industry.

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The total value added for the sheep industry (including wool) is estimated as follows:-

|      | <u>\$ million</u>                         |
|------|---|
| (A)  | 1,822                                     |
| (E)  | 5.124                                     |
| ((;) | 6,946                                     |
| (L)) | 1,822                                     |
| (E)  | 4,802                                     |
| (F') | 6,623                                     |
|      | _323                                      |
|      | (A.)<br>(F3)<br>(C)<br>(L))<br>(E)<br>(F) |

Wool production represented 80% of total sheep farm sector income over the three year period covered by the model, down from 86% from the last update and reflects the collapse of the wool price and the abolishment of the reserve price scheme. To remove the influence of wool in the same way as for milk in the cattle industry the model separates out prime lamb production from the total sheep industry. The prime sheep flock consists of all ewes not mated to wool-type sheep, a percentage of rams based on this breakdown and all prime lambs. This comparison for the farm sector is shown below.

|  |     | Total Sheep<br><u>\$ raillion</u> | Prime Sheep<br><u>\$ million</u> |
|--|-----|-----------------------------------|----------------------------------|
| Value of outputs to other sectors                    | (A) | 606                               | 365                              |
| Value of external outputs                            | (B) | _ <u>2.373</u>                    | <u>237</u>                       |
| Total outputs from cattle industry                   | (C) | 2,979                             | 602                              |
| Value of inputs from other sectors /a                | (D) | 82                                | 18                               |
| Value of external inputs                             | (E) | <u>3.124</u>                      | <u>996</u>                       |
| Total inputs to cattle industry                      | (F) | 4,370                             | 1,014                            |
| Value added (C - F) or (B - E)<br>(Operating Profit) |     | -227                              | <u>412</u>                       |

/a Opportunity cost of flock

Each sector's contribution to total value added in the sheep industry is estimated as follows:-

| Sector               | Value Added<br>(\$ m) | % of<br>Total | \$ per Head<br><u>of Sheep</u> | \$ per Sheep<br><u>Turned Off</u> |
|----------------------|-----------------------|---------------|--------------------------------|-----------------------------------|
| Farm (incl. wool)    | -227                  | -70.3         | -1.64                          | -5.96                             |
| Abattoir             | 176                   | 54.5          | 1.27                           | 4.62                              |
| OMP                  | 88                    | 27.2          | 0.63                           | 2.31                              |
| Tannery              | 25                    | 7.7           | 0.18                           | 0.66                              |
| Wholesale            | 21                    | 6.5           | 0.15                           | 0.55                              |
| Retail               | 178                   | 55.1          | 1.28                           | 4.67                              |
| Export               | 62                    | 19.2          | <u>0.45</u>                    | 1.63                              |
| Total (incl. wool)/a | 323                   | 99.9          | 2.33                           | 8.48                              |

The **external costs** (i.e. cost of materials and services purchased from sources outside the industry) incurred in each sector are estimated as follows:-

| -                  | External     | % of<br>Total | \$ per  | \$ per<br>Head | % of                |
|--------------------|--------------|---------------|---------|----------------|---------------------|
|                    | Costs        | Industry      | Head of | Turned         | Costs Which         |
| Sector             | <u>(\$m)</u> | Costs         | Sheep   | _Off_          | <u>Are External</u> |
|                    |              |               |         |                |                     |
| Farm (incl. wool)  | 3,124        | 66.2          | 22.54   | 82.05          | 97.4                |
| Abattoir           | 392          | 8.3           | 2.83    | 10.30          | 42.7                |
| OMP                | 183          | 3.9           | 1.32    | 4.81           | 59.7                |
| Tannery            | 120          | 2.5           | 0.87    | 3.15           | 47.8                |
| Wholesale          | . 11         | 0.2           | 0.08    | 0.29           | 8.5                 |
| Retail             | 675          | 14.3          | 4.87    | 17.73          | 60.8 ;              |
| Export             | _214         | 4.5           | 1.54    | 5.62           | 30.6                |
| Total (incl. wool) | 4,719        | 99.9          | 34.04   | 123.94         | 71.3                |
|                    |              |               |         |                |                     |

As with cattle, the main flow of funds out of the sheep industry occur in the farm, retail and abattoir sectors. Compared with the cattle industry, the sheep industry has a higher proportion of costs which are external (71% compared with 42%).

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The **external revenue** (i.e. income generated by sales to consumers outside the Meat and Livestock Industry) generated by each sector of the sheep industry is estimated as follows:-

| hich is |
|---------|
| 1. 1    |
| xternal |
| 79.7    |
| 4.2     |
| 86.6    |
| 100.0   |
| 23.3    |
| 100.0   |
| 100.0   |
| 73.8    |
|         |

The contribution of different products to the total external income of the sheep industry is shown in Table 4.

| Product Category .    | Source<br>Sector i  | External<br>Revenue (S m) | % of "otal<br>Revenue | J par Head<br>of Sheep | S per Head<br>Turned Off |
|-----------------------|---------------------|---------------------------|-----------------------|------------------------|--------------------------|
| Wool                  | Farm/Export /Tapper | 2.400                     | 46 8                  | 17.31                  | 63.04                    |
| Retail Cuts           | Retail              | 1.008                     | 19 7                  | 7.27                   | 26.47                    |
| Sausages and Mince a/ | Retail/CMP          | 419                       | 8 2                   | 3.02                   | 11.00                    |
| Live Exports          | Export              | 279                       | 54                    | 2.01                   | 7.30                     |
| Carcases              | Export              | 268                       | 5.3                   | 1.93                   | . 7.04                   |
| Boneless Meat         | Export/Wholesale    | 220                       | 4 3                   | 1.59                   | 5.78                     |
| Pet Food              | OMP                 | 145                       | 2 8                   | 1.05                   | 3.81                     |
| Wool-on Tanned Skins  | Tannery             | 124                       | 24                    | 0.89                   | 3.26                     |
| Dried Skins           | Tannery             | 71                        | 14                    | 0.51                   | 1.86                     |
| Salted Skins          | Tannery             | 50                        | 11                    | 0.42                   | 1.52                     |
| Other Products b/     | OWb                 | 54                        | 11                    | 0.39                   | 1.42                     |
| Rendered By-products  | Abattoir            | 46                        | 0)                    | 0.33                   | 1.21                     |
| Export Offal          | Expert              | 1.5                       | ·) 3                  | 0.11                   | 0.26                     |
| Fellmongered          | Tannery             | 11                        | 0 2                   | 0.08                   | 0.29                     |
| Retail Offal          | Wholesale/Recail    | 5                         | 0 1                   | 0.04                   | 0.13                     |
| Bones and Fac         | Wholesale/Retail    | 0.9                       | .00                   | 0.01                   | 0.02                     |
| Total (incl. wool)    |                     | 5,124                     | 99.9                  | 36,97                  | 134.58                   |
| Total (excl. wool)    |                     | 2,724                     | 53 2                  | 19.65                  | 71.54                    |

# TABLE 4 : SHEEP INDUSTRY : INCOME GENERATED BY EACH PRODUCT

a/ Includes emulsified products from OMP sector

b/ Includes canned meats; continental products; corned, salted and roast meat; and meat pies.

Table 4 indicates that wool is by far the major product in the sheep industry (47% of revenue, down from 62% in the 89/90 update) and that all other products can still be considered as co-products of wool production.

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### 3.3 PHYSICAL INPUTS AND OUTPUTS

Tables 5 to 8 show the physical product flows within the Australian cattle and sheep industries and the movements of products to consumers outside the industry. Figure 2, Section 2.2, describes the same input and product flows, but in a diagrammatic form.

#### 3.3.1 The Cattle Industry

The cattle model specifies 15 different outputs flowing between sectors and 17 external outputs (products moving from the industry to consumers). Several products fall into both categories, and several are a combination of products, e.g. "rendered by-products" includes tallow (edible and inedible) and meat meal; "canned meats" includes a range of products; and "retail cuts" includes a mixture of different beef cuts. All physical measurements apart from the tannery sector are in DWT (dressed weight equivalents). The products included in the cattle model are quantified in Table 5 and described in Table 7.

#### 3.3.2 The Sheep Industry

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The sheep model specifies 11 different outputs flowing between sectors, and 15 external outputs (products moving from the sheep industry to consumers). As in the cattle model, all physical measurements apart from the tannery sector are in DWT (dressed weight equivalents). The products included in the sheep model are quantified in Table 6 and described in Table 8.

|   |              |           |          | •                                       | SOLD TO:                              | ÷• •*     |        |        | TOTAL TO                                   |         |       |
|---|--------------|-----------|----------|---|---------------------------------------|-----------|--------|--------|--|---------|-------|
| FROM  |              | · FEEDLOT | ABATTOIR | ONP                                     | TANNERY                               | WHOLESALE | RETÁIL | EXPORT | SECTORS                                    | OUTPUTS | NPUTS |
| FARW. Bulla Staara  | 000 T DW T   |           | 675      | • |                                       |           |        | 28     | 901  | -       | 901   |
| Cows & Hallots  | ·000 T DWT   | 4         | 502      |   |                                       |           |        | 5      | 597  |         | 597   |
| Galves  | 000 T D W T  |           | 46       |   |                                       |           |        |        | 40   |         | 40    |
| Føøders Heavy   | 000 T DWT    | 146       |          |   |                                       |           |        |        | 148  | •       | 146   |
| Feedera Light   | 000 T DWT    | 29        |          |   |                                       | •         |        |        | 29   |         | 29    |
| n an 1997 an tha an<br>Tha an tha an   | μL           |           |          |   |                                       |           |        |        | 0  | 8.9     | 8.1   |
| FEEDLOT Export Cattle .   | 000 T DW T   |           | 217      | <del>-</del>                            |                                       |           |        |        | 217  |         | 217   |
| Local Cellis  | 000 T DWT    | 1         | 4 1      |   |                                       |           |        |        | 41   |         | 4 1   |
| Manure  | 000 T        |           |          |   |                                       |           |        |        | 0  | 800     | 900   |
| ABAYTGIA Bundland Filmaic   | 000 ï DW ī   |           |          |   | · · · · · · · · · · · · · · · · · · · | 120       | 2 ٺ 2  | 468    | 750  |         | 380   |
| Boneless Other  | 000 T D W T  | ĺ         |          | 109                                     |                                       | 56        |        | 457    | 621  |         | 621   |
| CATEASAS  | 000 T D W T  |           |          |   |                                       | 4 2       | 204    | 183    | 429  |         | 429   |
| Ollais  | 000 T D W I  |           |          | 1                                       |                                       | 1         | 2      | 58     | 62   |         | 6 2   |
| Other By-Preducts   | 000 T D W T  |           |          | 4.1                                     |                                       |           |        |        | 41   |         | 41    |
| Cattle Hidea  | millton pCs  |           |          |   | 70                                    |           |        |        | 1  |         | 7     |
| Call Skins  | million pca  |           |          |   | 11                                    |           |        |        | 1  |         | 1     |
| Rendered by-prode.  | 000 T D W 1  |           |          |   |                                       |           |        |        | . 0  | 589     | 589   |
| OMP Sausages & Smallgoods   | 000 T DW T   |           |          | •                                       |                                       |           | 20     |        | 20   |         | 20    |
| Pol Food  | 000 T DWT    |           |          |   |                                       |           |        |        | 0  | 182     | 183   |
| Em vieilled Producte  | 000 1 DW T   |           |          |   |                                       |           |        |        | 0  | 4 2     | 42    |
| All Olher   | 000 T DW T   |           |          |   |                                       |           |        |        | 0  | 32      | 32    |
| TANNERY, WelBlue Hides  | 000 pc s     |           |          |   |                                       |           |        |        | 0  | 1523    | 1523  |
| ·· Finlshed Lesther   | 000 pcs      |           |          |   |                                       |           |        |        | 0  | 1835    | 1835  |
| Sallad Call Skins   | 000 943      |           |          |   |                                       |           |        |        | 0  | 3815    | 3815  |
| Salled Cattle Hidea   | 000 pcs      |           |          |   |                                       |           |        |        | ····· ······ ······ ······ ····· ····· ··· |         | 1089  |
| WHOLESALE Bonelosa Primala  | 000 T D W I  |           |          |   |                                       |           | 50     |        | 50   |         | 50    |
| Bonela a Olher  | 000 T DW T   |           |          |   |                                       |           |        |        | 0  | 54      | . 58  |
| Garcases  | 000 T DWT    |           |          |   |                                       |           | 20     |        | 20   |         | 20    |
| 011=1   | 000 T D W T  |           |          | U                                       |                                       | •         | 0      |        | 1  |         | 1     |
| Other Retall Meat   | 000 T DW T   |           |          |   |                                       |           |        |        | 0  | 94      | 04    |
| Bones & Fal.  | 000 T DW T   |           |          |   |                                       |           |        |        | 0  | 7       | 1     |
| RETAIL Refail Cuta  | 000 T DW T   |           |          |   |                                       |           |        |        | 0  | 342     | 342   |
| Sauarges & Minoe  | 000 T D W T  |           |          |   |                                       |           |        |        | 0  | 104     | 104   |
| Ollala  | 000 T DW T   |           |          |   |                                       |           |        |        | 0  | 2       | 2     |
| Bones & Fat   | 900 T DWT    | 1         |          |   |                                       |           |        |        | 0  | 11      | 11    |
| EXPORTITION Boneless Primels  | 000 T DWT    |           |          |   |                                       |           |        |        | Q  | 488     | 486   |
| Boneleee Other  | 000 T DW T   |           |          |   |                                       |           |        |        | 0  | 457     | 457   |
| Garcases by Carcases  | 000 T DWT    |           |          |   |                                       |           |        |        | 0  | 163     | C81   |
| 01/#1#  | 000 T DWT    |           |          | •                                       |                                       |           |        |        | Q  | 58      | 58    |
| s de la constant de l<br>La constant de la cons | iniliion hd. |           |          |   |                                       |           |        |        | 0  | 0.2     | 0.2   |
|   |              |           | -        |   |                                       |           |        |        |  |         |       |

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# TABLE 5 : CATTLE INDUSTRY OUTPUTS

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### TABLE 6 : SUMMARY OF SHEEP INDUSTRY OUTPUTS

|                                       |                       |             | :        |     | SOLD TO: | · · · | · · · · · · | · · · · · · | • • • • | TOTAL TO |          |        |
|---------------------------------------|-----------------------|-------------|----------|-----|----------|-------|-------------|-------------|---------|----------|----------|--------|
|                                       |                       |             |          |     |          |       | •           |             |         | OTHER    | EXTERNAL | TOTAL  |
| FROM:                                 | PRODUCT               | י ידואט     | ABATTOIR | OMP | TANNERY  | whol  | ESALE       | RETAIL      | EXPORT  | SECTORS  | OUTPUTS  | INPUTS |
| FARM                                  | Wothers & Hoggets     | 000 T DWT   | 146      |     |          |       |             |             |         | 146      |          | 146    |
|                                       | Prime Lambs           | 000 T DWT   | · 233    |     |          |       |             |             |         | 233      |          | 233    |
|                                       | Sheep Other           | 000 T DWT   | 282      |     |          |       |             |             |         | 262      |          | 282    |
|                                       | Live Export           | 000 T DWT   |          |     |          |       |             |             | 134     | 134      | •        | 134    |
|                                       | Wool                  | 000 T -     |          |     |          |       |             |             |         | 0        | 700      | 700    |
| ABATTOIR                              | Bonaless Maat         | 000 T DW1   |          | 100 |          |       | 27          | 13          | 159     | 299      |          | 299    |
|                                       | Carcases'             | 000 T pWT   | 1        |     |          |       | 59          | 208         | 141     | 407      |          | 407    |
|                                       | Ollata                | 000 T 0W7   |          | ۲   |          |       | 2           | 3           | . 10    | śs       |          | 35     |
|                                       | Other By-Products     | 000 T DWT   | 1        | 33  |          |       |             |             |         | 33       |          | 33     |
|                                       | Rew Lemb Skins        | milion pcs  |          |     | 13       |       |             |             |         | 13       |          | 13     |
|                                       | Rew Shoop Skins:      | million pcs |          | •   | 20       |       |             |             |         | 20       |          | 20     |
|                                       | Rendered by prods.    | 000 T DWT   |          |     |          |       |             |             |         | 0        | 94       | 94     |
| ОМР                                   | Sausages & Smellgoods | 000 T DWT   |          |     |          |       |             | 16          |         | 16       |          | 16     |
|                                       | Pet Food              | 000 T DWT   |          |     |          |       |             |             |         | 0        | 152      | 152    |
| · · · · · · · · · · · · · · · · · · · | All Other             | 000 T DWT   |          |     |          |       |             |             |         | 0        | 44       | 44     |
| TANNERY                               | Wool on Tannad        | 000 pcs     |          |     |          |       |             |             |         | 0        | 3318     | 3318   |
|                                       | Sallad Skins          | 000 pcs     |          |     |          |       |             |             |         | 0        | 9909     | 9909   |
| 1                                     | Dried Skins           | 000 pcs     |          |     |          |       |             |             |         | 0        | 12865    | 12865  |
| l                                     | Felimongered Skin\$   | 000 pcs     |          |     |          |       |             |             |         | 0        | 3313     | 3313   |
|                                       | Wool                  | 000 T       |          |     |          |       |             |             | · · · · | 0        | 5        | 5      |
| WHOLESALE                             | Boneless Heet         | ODETDWI     |          | 7   |          |       |             |             |         | 7        |          | 1 7    |
|                                       | Carcasas              | 000 T DWT   |          |     | •        |       |             | 44          |         | 44       |          | . 44   |
|                                       |                       | 000 1 DW1   |          |     |          |       |             | 2           |         | 2        |          | 2      |
| 2000 (1995) A. <sup>2</sup> B.        | Other Retail Meat     | 000 T DW1   |          |     |          |       |             |             |         | 0        | 29       | 29     |
|                                       | Bones & Fai           | 000 I DWI   |          |     | ·        |       |             |             |         | 0        | 6        | 6      |
| RETAIL                                | Retall Cuts           | 000 T DWT   |          |     |          |       |             |             |         | 0        | 171      | 171    |
| .·                                    | Sausagos & Minca      | 000 T DWT   |          |     |          |       |             |             |         | 0        | 72       | 72     |
| and the second                        | Offala                | 000 T DWT   |          |     |          |       |             |             |         | 0        | 3        | 3      |
|                                       | Bones & Fat           | 000 T DWT . |          |     |          |       |             |             |         | 0        | 3        | 3      |
| EXPORT                                | Boneless Mezi         | 000 T DWT   |          |     |          |       |             |             |         | 0        | 159      | 159    |
|                                       | Carcssas .            | 000 T DWT   |          |     |          |       |             |             |         | 0        | 141      | 141    |
|                                       | Offals                | 000 T DWT   |          |     |          |       |             |             |         | 0        | 10       | 10     |
|                                       | Live Sheep            | million hd  |          |     |          |       |             |             |         | 0        | . 5      | 5      |
|                                       | Wool                  | 000 T       |          |     |          |       | •           |             |         | 0        | 6        | 6      |

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# TABLE 7 : DESCRIPTION OF PRODUCTS FLOWING THROUGH AND OUT OF THE CATTLE VALUE CHAIN

| 5 ·   | OUT OF THE CHITLE VALUE  | CLAMIN           |                                     |
|---|--|------------------|-------------------------------------|
|   | DESCRIPTION & COMMENTS   | SOURCE(S)        | DESTINATION(S)                      |
| A INTERMEDIATE PRODUCTS<br>Bulls and Stoers | Male cattle moved out of the farm sector. Excludes inter-farm movements within the farm sector. Average carcase weight specified separately for each of the 15 regions .   | Farm             | Abattoir<br>Export                  |
| Cowe and Heifers                            | Female cattle as shows.  | Farm             | Abattoir                            |
| Calver                                      | Calves sold from the farm sector. Mainly derived from dairy herds.<br>Average carcase weight is specified separately for each of the 15 regions.   | Farm             | Export<br>Abattoir<br>Export        |
| Heavy Feeders                               | Steers sold from the farm sector to feedboxers to be held on feed for<br>between 125-300 days. Average carcase weight 242kg at commencement<br>of feeding  | Parm             | Feedlot<br>Export                   |
| Light Feedere                               | Steens and heifens destined for feedlots producing beef for the domestic<br>market. Average varcase weight of 149kg at commencement of feeding.<br>Held on feed for between 70-80 days.                                | Farm             | Feedka.                             |
| Feedlot Steers - Heavy                      | Heavy loc-fed steers destined for export meat markets (e.g. Japan).<br>Average carnase weight is 360kg   | Feedlot          | Abattoir                            |
| Feedlot Steers - Light                      | Lighter loc-fed steers and heifers destined for domestic retail markets.<br>Average carcase weight 210kg.  | Feedlot          | Abettoir                            |
| Boreless Primals                            | Chilled or frozen koneless meat other than manufacturing grades.<br>Destined for sale to the wholesale, retail and export sectors.   | Abattcir         | Wholesale<br>Retail                 |
| Other Boneless                              | Frozen boneless manufacuring grade beef mainly for export to USA.<br>Some used for neurage, smallgords and canned foods.   | Abattoir         | Export<br>Export<br>Wholesale       |
| Carcases -                                  | Chilled or frozen honekest currases or quarters of various weights and<br>grades. Move from the abattour to butchers via wholessier or directly to<br>supermarkets, significant amount exported most notably to Kores. | Abattoir         | UMP<br>Whoksole<br>Retail<br>Export |
| Officia<br>Officia                          | Composite produc, estagory comprising all edible offels. Destined for the<br>wholesale-retail diannel or to exporters. Components include hearts,<br>kidneys, tails and longues.                                       | Abattoir         | Wholesale<br>Retail<br>Export       |
| Other By-products                           | Other + dible abattair by-products which are processed further in the Other<br>Meat Processing (IMP) sector. Components include beef theeks, tripe,<br>casings, wesserd meat, pet food.                                | Abattoir         | OMP<br>OMP                          |
| Cattle Hides                                | Raw hides ex-altertoir   | Abattoir         | Tannery                             |
| Culf Skins                                  | Raw calf skins -: x-nbattoir   | Abator           | 'Tannery                            |
| Sausages and Smullyconds                    | Beef or mainly beer foousages and other processed means contaiting beef<br>or mainly beef  | OMP              | Retail                              |
| B. FINAL PRODUCTS<br>Milk                   | Whole fresh mulk delivered to farm gate.   | <br>Farm         | External                            |
| Manure                                      | Manure sold from feedlots  | Feedketa         | Enernal                             |
| Rendered By-products                        | Meat Meal tallow (edible/inedible), bone & blood meal  | Abattoir         | External                            |
| Sausages & Smallgoods                       | Beet or mainly beet sausages and other processed means containing beet<br>or mainly beet sold to the food service industry.  | мр               | Extenuel                            |
| Pet Fond                                    | Beef, offals and by-products used in canned and other yet foods.   | OMP              | External                            |
| Canned Meat                                 | Beefused in canned beef products .   | OMP              | External                            |
| Corned and Salted Meat                      | Beefused in correct and salted meat  | JMP              | External                            |
| Wet Blue Hides                              | Semi-processed ittics, typically to wet hlue stage.  | l'amery          | External .                          |
| Finished Leather                            | Cattle hides processed through to finished leather   | Estunery         | External                            |
| Salted calf skins                           | Dry or wet sale i calf skins - int otherwise processed   | Cannery          | External                            |
| Other Retal Meat/Offals                     | Meat provided by wholesalers to the food services industry.  | Musiesale        | External                            |
| Retail Cuts                                 | Comparite of table beef cuts retailed by butchers and supermarkets   | letail           | External                            |
| Saurages and Minoe                          | Beef sausages and minor produced in butcher shops, supermakrets or the OMP sector, retained through supermarkets and butchers.   | રતાથી            | External                            |
| Boneless Primals                            | Exports of boneiess meat other than manufacturing grades   | 3xport.          | External                            |
| Other Boneless                              | Exports of boneicas manufacturing grade beef.  | Sxport           | Елепыі                              |
| Carcases                                    | Exports of beel carcases or quarters of various weights and grades   | Export           | External                            |
| Offals<br>Live Cattle                       | Exports of mixed beef offals.<br>Composite of bulls steers, ows, helfers and raives exported for slaughter   | Export<br>Export | External<br>External                |

# TABLE 8 : DESCRIPTION OF PRODUCTS WHICH FLOW THROUGH AND OUT OF THE SHEEP VALUE CHAIN

|                                | DESCRIPTION & COMMENTS  | SOURCE(S) | DESTINATION(S)                       |
|--------------------------------|---|-----------|--------------------------------------|
| AINTERMEDIATE                  |   |           |                                      |
| PRODUCIS<br>Wethers & Hoggets  | Wethers at d hoggets sold from farm sector, Excludes inter-farm<br>moviments and export wethers/hoggets. Average carcase weight<br>21kg.  | Farm      | Abattoir                             |
| Prime Lambs                    | Prince lambs as above. Average carcase weight 18kg.   | Farm      | Abattoir                             |
| Sheep Other                    | Cast for aguewes and rams sold from farm sector but excluding inter-farm nales. Average carcase weight 21kg.  | Farm      | Abattoir                             |
| Heavy Feeders                  | Wethers at d hoggets sold from the farm sector as shippers, mainly<br>to the Midele East. Also includes sale of breeding sheep to export<br>markets. A verage carcase weight 28kg.  | Farm      | Export                               |
| Boneless Meat                  | Chilled or frozen boneless mutton, mainly for the export market.<br>Some used for sausages, canned foods and pet food.  | Abattoir  | Export-<br>OMP                       |
| Carcases                       | Chilled or frozen mutton or lamb carcases or quarters. Destined for<br>retail markst either directly or via wholesalers. Considerable<br>amount also exported.  | Abattoir  | Wholesale<br>Retail<br>Export        |
| Offals .                       | Composite product category comprising all edible otfals destined for<br>the wholessile-retail channel or to exporters. Components include<br>kidney, heart, tongue, brain and liver. Some used for sausages and<br>canned fock or pet food. | Abattoir  | Wholesale<br>Retail<br>OMP<br>Export |
| Other Buonducts                | Other abalioir by products which are processed further in the   | Abattoir  | OMP                                  |
| •                              | Other Meat Processing (OMP) sector. Components include spleen,<br>casings and pet food.   | Abattoir  | Таплегу                              |
| Lamb & Sheep Skins             | Raw sheep & lamb skins.   | OMP       | Retail                               |
| Sausages and Smallgoods        | Sausages a xd smallgoods containing mutton sold directly to   |           |                                      |
| B. FINAL PRODUCTS              |   | ····      |                                      |
| Wool                           | Greasy wool delivered to broker   | Farm      | External                             |
| Rendered By-products           | Mean meal, tallow, bone meal, blood meal etc.   | Abattoir  | External                             |
| Sausages & Smallgoods          | Saurages and smallgeods containing mutton sold to the tood services<br>industry including restaurants, hotels, institutions, etc  | омр       | External                             |
| Pet Food                       | Mutton use 1 in canned or other petfood   | OMP       | External                             |
| Canned Meat                    | Mutten used in canned meat products   | OMP       | External                             |
| Wool-on Tanned Skins           | Lamb and theep skins tanned with worken. Destined for domestic<br>or export market.   | Таплегу   | External                             |
| Salted Skins                   | Salted sherp and lamb skins exported for further processing.  | Таплегу   | External                             |
| Dried Skins                    | Dried sheep and lamb skins exported for further processing.   | Tannery   | External                             |
| Fell-mongered                  | Fell-inongered skins to wet blue stage  | Tannery   | External                             |
| Other Retail Carcases   Offals | Carcuses at d ottals provided by wholesalers to the food services<br>industry including restaurants, institutions etc   | Wholesale | External                             |
| Retail Cuts                    | , Composite of table cuts, mainly lamb and some mutton, retailed by<br>outchers and supermarkets. Excludes sausages, mince, offais etc.   | Retail    | External                             |
| Sausages and Mince             | Sausages and mince containing mainly lamb and some mutton<br>produced in butchers and supermarkets or the OMP sector sold in  | Retail    | External                             |
| Boneless Meat                  | Alterization '  | Export    | External                             |
| Carcases                       | Courses of concrete meat, nearly all mutton.  | Export    | External                             |
| (भूगित्मः                      | 2   | Export    | External                             |
| Live Sheep                     | Exports of ottal,<br>Exports of vethers and hoggets for slaughter and other sheep for<br>precting.  | Export    | External                             |

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THE VALUE CHAIN FOR MEAT AND LIVESTOCK PRODUCTS MAIN REPORT

### 4. PRIMARY PRODUCTION

#### 4.1 THE FARM SECTOR

#### 4.1.1 General

The farm sector is the most complex of the eight sectors included in the value chain model. Throughout Australia, the production processes differ markedly between regions, according to the balance between the beef and dairy cattle populations and between wool and prime lamb production. To allow the model to represent this complexity, the farm sector has been broken down into northern and southern zones (according to MRC's north-south demarcation) and 15 regions (based on 13 ABARE Agricultural and Grazing Industry Survey regions). Figure 5 shows the location of the 13 ABARE regions. ABARE region 8 has been divided into northern and southern and southern portions, and ABARE region 7 has been divided into coastal and tablelands portions. Annex 3 relates the model's 15 regions to the ABARE regions and the ABS statistical divisions. The regions for the cattle and sheep industry models are presented in Annexes 6 and 7.

#### 4.1:2 Livestock Population and Production

ABS farm census data for 31 March, 1992, 1993 and 1994 were used to compile livestock population data for the 15 regions. These data are summarised in Tables 9 (cattle) and 10 (sheep) and presented in full in Annexes 6 and 7. Tables 11a (cattle) and 12a (sheep) show livestock turnoff data and milk or wool production for the 15 regions. Tables 11b and 12b show turnoff data for beef cattle and prime sheep production for the 15 regions. Turnoff data refer to turnoff for slaughter or live export only. Movements between farms and within or between regions are excluded. While these movements sum to zero for the total industry, this assumption tends to over-estimate production in cattle fattening areas and under-estimate it in storeproducing areas.

#### Cattle

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The main conclusions which can be drawn from Tables 9 and 11 are:-

- (i) Southern Australia has 52% of the total cattle herd and accounted for 54% of national turnoff but only 48% of beef production.
- (ii) About 90% of milk production comes from southern Australia which contains 89% of the national dairy herd.
- (iii) The northern regions, Northern Wheat Sheep-North and North Eastern Mixed ranked first and second respectively in beef production, with beef production in the north being 52% of the Australian total.

(iv) The two southern regions, Southern Wheat Sheep and Southern High Rainfall ranked third and fourth respectively in beef production and second and first in milk production respectively.

### FIGURE 5 : REGIONS OF THE ABARE AGRICULTURAL AND GRAZING INDUSTRIES SURVEY



2. Western Wheat Sheep

4. Southern High Rainfall

3. Western Pastoral

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- 6. Southern Pastoral
  - 7. Eastern High Rainfall
  - 8. Northern Wheat Sheep
- 10. North Eastern Pastoral
- 11. Central Pastoral
- 12. Northern Pastoral
- 13. Tasmania.

Southern Regions: 1, 2, 3, 4, 5, 6, 7, 8 (S of NSW-Qld border) and 13.

Northern Regions: 8 (N of NSW-Qld border), 9, 10, 11, 12.

Note: The corresponding module code numbers are listed in Annexes 6 and 7.

# TABLE 9 : SUMMARY OF CATTLE POPULATION DATA IN VALUE CHAIN MODEL

(.000 head) Turnoff" Beef Dairy Cattle Total 8 £ Subsector/Region No. 1000 Cattle Cattle Beef Dairy ٩ 2,478 10 2 18 8,259 3,777 4,481 34 33 36 Total 21,661 24,139 90 11,366 North South 93 276 11,642 12,497 93 Western High Rainfall Western Wheat Sheep 109 5 79 99 21 1 215 518 435 409 42 38 33 33 35 35 47 367 17 409 429 221 458 151 Western Pastoral Tasmania 221 613 61 234 100 75 59 95 96 97 95 155 25 Southern High Rainfall Southern Wheat Sheep 1,189 1,222 125 2,467 31 18 1,091 3.559 2.697 602 3 3,299 Southern Pastoral 1 4 Southern Pastorai Eastern High Rainfall T Eastern High Rainfall C Northern Wheat Sheep S Northern Wheat Sheep N 462 272 551 1,330 58 1,308 459 1,230 2,720 3,970 588 1.222 20 171 3 74 1 3 5 1,286 1,291 259 711 2.646 3,775 North Eastern Mixed 195 1,006 North Eastern Pastoral Central Pastoral 1,006 100 \_ 100 Northern Pastoral 310 6 ,316 90 230

(Farm Sector)

<u>a</u>/ Excludes inter-farm livestock movements within the farm sector. Includes live export.

# TABLE 10 : SUMMARY OF SHEEP POPULATION DATA IN VALUE CHAIN MODEL

(Farm Sector)

|                         | Total Sheep | * of Mating: | Durnoff" |    |  |
|-------------------------|-------------|--------------|----------|----|--|
| Model/Subsector/Region  | ('000)      | Breeds       | No. '000 | 3  |  |
| Total                   | 138.612     | 76           | 38,075   | 27 |  |
| Western High Rainfall   | 1,879       | 65           | 1,235    | 65 |  |
| Western Wheat Sheep     | 26,946      | <b>5.</b>    | 5,392    | 20 |  |
| Western Pastoral        | 3,897       | 97           | 584      | 15 |  |
| Tasmania                | 4,256       | н3           | 948      | 22 |  |
| Southern High Rainfall  | 22,157      | ร่ก้         | 7,289    | 33 |  |
| Southern Wheat Sheep    | 43,953      | 65           | 15,039   | 34 |  |
| Southern Pastoral       | 8.332       | 32           | 1,545    | 19 |  |
| Eastern High Rainfall T | 6.757       | -2           | 1,985    | 29 |  |
| Eastern High Rainfall C | 58          | 44           | 20       | 34 |  |
| Northern Wheat Sheep S  | 7,179       | 75           | 2,256    | 32 |  |
| Northern Wheat Sheep N  | 4,065       | .95          | 755      | 19 |  |
| North Eastern Mixed     | 22          | 55           | 4        | 18 |  |
| North Eastern Pastoral  | 5,268       | 100          | 578      | 11 |  |
| Central Pastoral        | 3,953       | 100          | - 437    | 11 |  |
| Northern Pastoral       | 0           | 0            | 0        | 0  |  |

a/ Excludes inter-farm livestock movements within the farm sector. Includes live export.

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| TABLE 11a : | SUMMARY C | <b>F PHYSICAL</b> | OUTPUTS | FROM | CATTLE | FARM |
|-------------|-----------|-------------------|---------|------|--------|------|
|             |           | SECTO             | R       | •    |        |      |

| Subsector   | Bulls<br>&<br>Steers<br>('000)                        | Cows<br>&<br>Heifers<br>{'000)                        | Calves ('000)                    | Heavy<br>(*000)                        | eeders<br>Light<br>('900)  | Total<br>Turnoff<br>(*000)                        | Total<br>Turnoff<br>,'000 T<br>DWT)                  | Milk<br>('000 L)  |
|---|---|---|----------------------------------|--|----------------------------|---|--|---|
| Total<br>North<br>South   | 3,700<br>2,134<br>1,565                               | 2,669<br>1,256<br>1,413                               | 1,089<br>149<br>940              | 60;5<br>173<br>127                     | 195<br>59<br>136           | 8,259<br>3,777<br>4,481                           | 1,720<br>894<br>826                                  | 8,943<br>917<br>8,026                                   |
| Region<br>Western High Rainfall<br>Western Wheat Sheep<br>Western Pastoral<br>Tasmania<br>Southern High Rainfall<br>Southern Wheat Sheep<br>Southern Pastoral<br>Eastern High Rainfall T<br>Eastern High Rainfall C<br>Northern Wheat Sheep Sth | 85<br>82<br>29<br>96<br>215<br>570<br>40<br>127<br>76 | 64<br>61<br>19<br>75<br>377<br>387<br>42<br>151<br>97 | 46<br>8<br>415<br>259<br>4<br>55 | 15<br>9<br>35<br>36<br>31<br>107<br>14 | 403-<br>451-<br>3247<br>47 | 215<br>151<br>234<br>1.189<br>1 2.2<br>462<br>272 | 41<br>33<br>12<br>44<br>187<br>220<br>27<br>95<br>47 | 432<br>22<br>0.1<br>418<br>3,891<br>2.257<br>241<br>726 |
| Northern Wheat Sheep-Sth<br>North Eastern Mixed<br>North Eastern Mixed<br>North Eastern Pastoral<br>Central Pastoral<br>Northern Pastoral   | 245<br>567<br>698<br>147<br>474<br>148                | 140<br>355<br>492<br>106<br>226<br>78                 | 17<br>46<br>90<br>4<br>6<br>4    | 111<br>163<br>4<br>3                   | 37<br>55<br>3<br>1<br>1    | 551<br>1,285<br>1,291<br>259<br>711<br>230        | 119<br>316<br>311<br>55<br>157<br>47                 | 31<br>243<br>652<br>0.7<br>0.7<br>21                    |

a/ Excludes inter-farm lives:ock movements within the farm sector. Includes live export.

#### TABLE 11b : SUMMARY OF PHYSICAL OUTPUTS FROM BEEF CATTLE FARM SECTOR

| Subsector                                   | Bulls<br>&<br>Steers | Cows<br>&<br>Heifers | Calves | Heavy<br>(19u0) | Light | Total<br>Turnoff | Total<br>Turnoff<br>('000 T | Milk<br>('000 L) |
|---|----------------------|----------------------|--------|-----------------|-------|------------------|-----------------------------|------------------|
|   | 1 3001               | 1 3361               |        |                 | 1 700 |                  |                             |                  |
| Toral                                       | 3 683                | 2 115                | 1.68   | 605             | 195   | 6.986            | 1.606                       | G                |
| North                                       | 2 1 1 7              | 1,713                | 41     | .71             | 154   | 1.611            | 1,000                       | õ                |
| South                                       | 1,550                | 1,116                | 125    | 127             | 136   | 3,354            | 726                         |                  |
|   |                      | .,                   |        |                 |       | • • • • • •      |                             | •                |
| · Region                                    |                      |                      |        |                 |       |                  |                             |                  |
| Western High Rainfall                       | 94                   | 51                   | 2      | 1.7             | 4     | 164              | 26                          | G                |
| Western Wheat Sheep                         | 82                   | 60                   | 2      | -1              | 0     | 146              | 32                          | ŷ                |
| Western Pastoral                            | 27                   | 19                   | :      | 3               | 3     | 61               | 12                          | ò                |
| Tasmania                                    | 25                   | 54                   |        |                 | -     | 153              | 37                          | 5                |
| Southern High Rainfall                      | 207                  | 22?                  | 2      | 3.              | 45    | 624              | 135                         | ð                |
| Southern Wheat Sheeo                        | 500                  | 306                  | 40     | 5               | 1     | 213              | 193                         | ė                |
| Southern Pastoral                           | 40                   | 41                   | 3      | 3 !             | 2     | 124              | 27                          | ō                |
| <ul> <li>Eastern High Rainfall T</li> </ul> | 127                  | 143                  | 22     | . 07            | 32    | 432              | 92 -                        | 5                |
| - Eastern High Rainfall C                   | 75                   | 74                   | 15     | 11              | 4     | 182              | 47                          | Ğ                |
| Northern Wheat Sheep-Sth                    | 245                  | 139                  | 14     | :11             | 37    | 548              | 118                         | •)               |
| Northern Wheat Sheep-Nth                    | 666                  | 346                  | 16     | 5.1             | 55    | 1,248            | 313                         | 0                |
| _ North Eastern Mixed                       | 697                  | 166                  | 14     | 4               | ;     | 1,188            | 301                         | G                |
| North Eastern Pastoral                      | 147                  | 105                  | 4      | :               | :     | 259              | 66                          | ;)               |
| Central Pastoral                            | 474                  | 226                  | -      | -;              | 1     | 711              | 157                         | 0                |
| Northern Pastoral                           | 148                  | - <b>c</b>           | :      |                 |       | 227              | 47                          | 0                |

a/ Excludes inter-farm livestock movements within the farm sector. Includes live export.

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#### TABLE 12a : SUMMARY OF PHYSICAL OUTPUTS FROM SHEEP FARM SECTOR

| Subsector                                       | Wethers &<br>Hoggets<br>('000) | Prime<br>Lambs<br>('000) | Live<br>Export<br>('000) | Other<br>Sheep<br>('000) | Total<br>Turnoff<br>('000) | Total<br>Turnoff<br>('000 T<br><u>DWT</u> ) | Wool<br>Produced<br>(tonnes) |
|---|--------------------------------|--------------------------|--------------------------|--------------------------|----------------------------|---|------------------------------|
| Total 6,964                                     | 13,054                         | 4,835                    | 13,222                   | 38,075                   | 794                        | 700,062                                     |                              |
| <u>Region</u><br>Western High Rain <i>f</i> all | 19                             | 281                      | 740                      | 195                      | 1,235                      | 30  | 10,408                       |
| Western Wheat Sheep                             | 53                             | 1,071                    | 1,491                    | 2.787                    | 5,392                      | 118   | 147,645                      |
| Western Pastoral                                | 28                             | 39                       | 358                      | 159                      | 584                        | 15  | 18,517                       |
| Tasmania  | 245                            | 276                      | 32                       | 396                      | 948                        | 20  | 17,458                       |
| Southern High Rainfall                          | 1,149                          | 2,976                    | 892                      | 2,272                    | 7,289                      | 154   | 111,811                      |
| Southern Wheat Sheep                            | 3,536                          | 6,414                    | 3,757                    | 1,331                    | 15,039                     | 310   | 221,907                      |
| Southern Pastoral                               | 280                            | 210                      | -                        | 1,055                    | 1,545                      | 32  | 17,806                       |
| Eastern High Rainfall T                         | 425                            | 908                      | -                        | 653                      | 1,985                      | 39  | 27,163                       |
| Eastern High Rainfall C                         | 3                              | 11                       | -                        | 5                        | 20                         | 0.4   | 216                          |
| Northern Wheat Sheep-Sth                        | <u>578</u>                     | 778                      | -                        | 810                      | 2,266                      | 44  | 35,616                       |
| Northern Wheat Sheep-Nth                        | 308                            | 06                       | -                        | 367                      | 755                        | 15  | 19,609                       |
| North Eastern Mixed                             | -                              | 2                        | -                        | 3                        | 4                          | 0.1   | 82                           |
| North Eastern Pastoral                          | 134                            | 5                        | -                        | 439                      | 578                        | 12  | 23,711                       |
| Central Pastoral                                | 107                            | S                        | -                        | 325                      | 437                        | 9   | 18,112                       |
| Northern Pastoral                               | 0                              | -0                       | 0                        | 0                        | 0                          | 0   | 0                            |

a/ Excludes inter-farm livestock movements within the farm sector. Includes live export.

#### TABLE 12b : SUMMARY OF PHYSICAL OUTPUTS FROM PRIME SHEEP FARM SECTOR

| Subse                             | ctor         | Wethers &<br>Hoggets<br>('C00) | Prime<br>Lambs<br>('000) | Live<br>Export<br>(*000) | Cther<br>Sheep<br>(1000) | 'fotal<br>Turnoff<br>('000) | Total<br>Turnoff<br>('000 T<br>DWT) | Wool<br>Produced<br>(tonnes) |
|-----------------------------------|--------------|--------------------------------|--------------------------|--------------------------|--------------------------|-----------------------------|-------------------------------------|------------------------------|
| Total-                            |              | 13,054                         | -                        | 2,575                    | :5,629                   | 286                         | 136,736                             |                              |
| Region                            |              |                                |                          |                          |                          |                             |                                     |                              |
| Western High                      | Rainfall     | -                              | 281                      | -                        | 58                       | 338                         | 6                                   | 3,067                        |
| Western Wheat                     | Sheep        |                                | 1.071                    | -                        | 273                      | 1.344                       | 23                                  | 14,462                       |
| <ul> <li>Western Paste</li> </ul> | oral         | -                              | 39                       | -                        | 4                        | 42                          | 1                                   | 409                          |
| Tasmania                          |              | -                              | 276                      | -                        | 54                       | 330                         | 6                                   | 2,390                        |
| Southern High                     | h Rainfall   |                                | 2,976                    | -                        | 633                      | 3.602                       | 67                                  | 31,153                       |
| Southern Whe                      | at Sheeo     | -                              | 6.414                    | -                        | 1,133                    | 7.547                       | 140                                 | бь,939                       |
| Southern Past                     | toral        | -                              | 210                      | -                        | 53                       | 263                         | 5                                   | 2.374                        |
| Eastern High                      | Rainfall T   | -                              | 208                      | -                        | 180                      | 1,089                       | 20                                  | 7,489                        |
| Eastern High                      | Rainfall C   | -                              | 11                       | -                        | 3                        | 13                          | 0.2                                 | 77                           |
| Northern Whe                      | at Sheep-Sth | -                              | 778                      | -                        | 1.70                     | 947                         | 17                                  | 7,467                        |
| Northern Whe                      | at Sheep-Nth | -                              | 80                       | -                        | 14                       | 94                          | 2                                   | 1 786                        |
| North Eastern                     | n Mixed      | -                              | 3                        | -                        | 0                        | 5                           | 0                                   | 12                           |
| North Easter                      | n Pastoral   | -                              | 5                        | -                        | 1                        | 5                           | 0.1                                 | 46                           |
| Central Past                      | oral         | -                              | 5                        | -                        | 1                        | 1                           | 0.1                                 | 45                           |
| Northern Pas                      | toral        | -                              | -                        | •                        | -                        | -                           | -                                   |                              |

a/ Excludes inter-farm livestock movements within the farm sector. Includes live export.

(v) The main beef-producing regions in order of importance are:-

|      | ,  |   |
|------|--|---|
| 18.4 | Northern Wheat Sheep - North               | 19.5  |
| 18.1 | North Eastern Mixed                        | 18.7  |
| 12.8 | Southern Wheat Sheep                       | 12.0  |
| 10.9 | Central Pastoral                           | 9.8   |
| 9.1  | Southern High Rainfall                     | 8.6   |
| 6.9  | North Wheat Sheep - South                  | 7.3   |
|      | 18.4<br>18.1<br>12.8<br>10.9<br>9.1<br>6.9 | % Specialist Beef18.4Northern Wheat Sheep - North18.1North Eastern Mixed12.8Southern Wheat Sheep10.9Central Pastoral9.1Southern High Rainfall6.9North Wheat Sheep - South |

<sup>(</sup>vi) The main milk-producing regions in order of importance are:-

|                               | <u>% of Total Milk</u> |
|-------------------------------|------------------------|
| Southern High Rainfall        | 43.5                   |
| Southern Whea: Sheep          | 25.2                   |
| Eastern High Rainfall - Coast | 8.1                    |
| North Eastern Mixed           | 7.3                    |
| Western High Rainfall         | 4.8                    |
| Tasmania                      | 4.7                    |

The north/south zones in the cattle farm sector represent two livestock raising areas which are distinctly different in character. Whilst all breeding, trading, growing, fattening and dairy production enterprises are represented in both areas and almost all regions, the enterprise mix and production systems are quite different. In the north, herds are larger, beef producers are more specialised, export markets are more important, and **Bos indicus** breeds more numerous. In the south, beef production tends to be part of a mixed farming system or is a by-product of dairying. Greater emphasis is placed on the domestic market and lighter carcases are produced from younger animals in the south. The significance of the live export trade in the north is becoming more apparent with five percent of national turnoff being shipped.

#### Sheep

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The main conclusions which can be drawn from Tables 10 and 12 are:-

- (i) Southern Australia is completely dominant in sheep and wool production. It generates 98% of the sheepmeat and 91% of the wool output.
- (ii) The main prime lamb-producing regions in order of importance are:-

|                                    | % of Total Lambs (No.) |
|------------------------------------|------------------------|
| Southern Wheat Sheep               | 49.1                   |
| Southern High Rainfall             | 22.8                   |
| Western Wheat Sheep                | 8.2                    |
| Eastern High Rainfall - Tablelands | 7.0                    |
| Northern Whear Sheep - South       | 6.0                    |

(iii) Total sheepmeat production, including live exports, is concentrated in the following regions:-

| % of Total Sheepmeat               |      | % of Prime Sheepmeat     |      |
|------------------------------------|------|--------------------------|------|
| Southern Wheat Sheep               | 39.0 | Southern Wheat Sheep     | 49.0 |
| Southern High Rainfall             | 19.4 | Southern High Rainfall   | 23.4 |
| Western Wheat Sheep                | 14.5 | Western Wheat Sheep      | 8.0  |
| Northern Wheat Sheep - South       | 5.5  | Eastern High Rainfall -T | 7.0  |
| Eastern High Rainfall - Tablelands | 4.9  | Northern Wheat Sheep     | 5.9  |

(iv) The main wool-producing areas in order of importance are:-

|                              | % of Total Wool |
|------------------------------|-----------------|
| Southern Wheat Sheep         | 31.7            |
| Western Wheat Sheep          | 21.1            |
| Southern High Rainfall       | 16.0            |
| Southern Pastoral            | 6.8             |
| Northern Wheat Sheep - South | 5.1             |

#### 4.1.3 External Inputs and Outputs

Tables 1 and 5 (cattle) and 3 and 6 (sheep) show that in both physical and financial terms the farm sector has its main linkages with the abattoir sector and the external environment (for outputs and inputs). External input costs for the cattle and sheep sectors are broken down into the cost categories used by the model and are shown in Table 13. An opportunity cost has been allocated to both cattle and sheep industry. This is a change from previous RADIS updates. The opportunity cost measures the cost associated with running cattle or sheep as opposed to selling all the livestock and placing the receipts in another form of investment. For this update a five percent investment rate has been used.

| TUDLE | 13: | LAILE | UNAL I | INPUIS PURCHASI | ID BI | THE FARM SECTOR |
|-------|-----|-------|--------|-----------------|-------|-----------------|
|       |     |       | •      | (\$ million)    |       |                 |

|                        |       | Cattle |       | Sheep |
|------------------------|-------|--------|-------|-------|
| Cost Item              | Total | North  | South | Total |
| Pasture/Fertiliser     | 209   | 26     | 183   | 233   |
| Fodder                 | 496   | 198    | 298   | 129   |
| Wages                  | 409   | 145    | 264   | 334   |
| Freight                | 56    | 26     | 29    | 41    |
| Selling Costs          | 122   | 47     | 75    | 80    |
| Shearing and Crutching | 0     | 0      | Û     | 222   |
| Wool - Deductions      | 0     | 0      | 0.    | 205   |
| Other Variable Costs   | 788   | 240    | 548   | 586   |
| Interest               | 561   | 190    | 371   | 381   |
| AMLC/MRC Levies        | 33    | 15     | 18    | -     |
| Overhead Costs         | 1,284 | 458    | 686   | 912   |
| Total                  | 3,958 | 1,346  | 2,612 | 3,124 |

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Pasture and fertiliser costs include expenditure on pasture seed and legume inoculant, fertiliser and chemicals, and associated freight. This cost does not include costs for cropping activities.

Payments for fodder include purchases of livestock feeds, fodder and fodder supplements, and all associated freight.

Shearing and crutching includes costs such as shearers' wages, meals and electricity associated with shearing sheep.

Wool deductions include the various components of the Australian Wool Corporation's (AWC) tax on wool.

Other variable costs include payments for electricity and other services, fuels, contractors (e.g. mustering, etc.), repairs and maintenance.

Wages include all expenditure on farm labour, including managers.

Livestock freight includes cartage and other charges associated with the transportation of livestock to the point of sale in other sectors and the inter-farm movement of stock within the sector.

Livestock commission includes the cost of commission, insurance, and handling charges on the sale of livestock or wool. Interest includes the interest on debt and working capital. Levies on the sale of livestock (AMLC/MRC) have been included in this sector for cattle but not for sheep, as these are collected at the point of slaughter. Overhead costs include expenses such as rates and taxes, water charges, insurance, postage, telephone, accountancy, farm consultancy, legal fees, office supplies and sundries.

In the cattle industry the farm sector purchases \$4.0 billion worth of inputs from sources external to the industry. This is 55% of the total value of external cattle industry inputs. In the sheep industry farm sector external inputs are \$3.1 billion which is 67% of total sheep industry external inputs. Overall, the farm sector purchases \$7.1 billion in inputs for cattle and sheep production.

#### Cattle

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The total value of outputs from the farm sector attributable to cattle is \$6.38 billion, of which \$3.22 billion is livestock supplied to the abattcir sector and \$2.66 billion is milk. About \$431 million worth of livestock are sold to the feedlot sector and exports are valued at \$73 million. Table 14a and 14b summarise the cattle farm sector and beef cattle farm sector costs, incomes and value added on a regional basis. The main conclusions are:-

- (i) Total inputs purchased by the farm sector in the south are nearly double (194%) those purchased in the north.
- (ii) In the cattle industry the main input purchasing regions in order of importance are:-

| -                                  | <u>% of Total Input Value</u> |
|------------------------------------|-------------------------------|
| Southern High Rainfall             | 20.2                          |
| Southern Wheat Sheep               | 19.7                          |
| North Eastern Mixed                | 13.9                          |
| Northern Wheat Sheep - North       | 11.8                          |
| Eastern High Rainfall - Tablelands | 7.4                           |

(iii) Total purchase inputs for the beef farm sector were \$1.056 billion less than for the total farm sector.

#### TABLE 14a : SUMMARY OF FINANCIAL RESULTS FOR CATTLE FARM SECTOR

| (\$ million)   |   |  |  |  |  |   |  |   |  |  |
|--|---|--|--|--|--|---|--|---|--|--|
| No. of Inputs F  | rom   |  | Jutputs T  | 2  |  | Value   |  |   |  |  |
|  | Cattle<br>('000)  | Other<br>Sentors                           | /a<br>External   | Total  | Other<br>Sectors                                       | Excernal  | Total  | Value<br>Added  | Added/<br>Head (\$)                                      |  |
| Total<br>North   | 24,139<br>11,642  | 412<br>162                                 | 3,957<br>1,340   | 4,370<br>1,508                                   | 3,720<br>1,952   | 2,562<br>299<br>2,563                             | 5 382<br>2 251   | 2,012<br>744  | 83<br>64<br>101  |  |
| Joden  | 12,497  | 200  | 4,012  | 2,002  |  | 2, 105  | 4 200  | 1,230   | 101  |  |
| Legion<br>Western High Rainfall<br>Western Wheat Sheep<br>Western Pastoral<br>Tasmania<br>Southern High Rainfall<br>Southern Wheat Sheep<br>Southern Pastoral<br>Eastern High Rainfall<br>- Tablelands<br>Eastern High Rainfall<br>- Coast | 518<br>435<br>221<br>613<br>3,559<br>3,559<br>3,559<br>3,75<br>1,388<br>860 | 11<br>9<br>12<br>84<br>68<br>5<br>25<br>14 | 107<br>67<br>23<br>139<br>900<br>781<br>49<br>291<br>135 | 119<br>76<br>24<br>151<br>884<br>54<br>54<br>310 | 87<br>179<br>27<br>85<br>402<br>467<br>58<br>207<br>99 | 136<br>7<br>104<br>1,795<br>300<br>3<br>82<br>248 | 223<br>76<br>28<br>190<br>1 497<br>1 147<br>61<br>290<br>346 | 105<br>{0.6}<br>3<br>9<br>612<br>.298<br>8<br>(26)<br>197 | 203<br>(1)<br>15<br>64<br>172<br>90<br>20<br>(19)<br>229 |  |
| Northern Wheat Sheep<br>- South  | 1.230   | 21   | 219  | 240  | 263  | 10  | 274  | 34  | 27   |  |
| Northern Wheat Sheep<br>- North<br>North Eastern Mixed   | 2,720   | 45<br>66                                   | 465  | 510  | 703<br>668   | 79<br>213   | 782<br>880   | 271<br>264  | 100<br>67  |  |
| North Eastern Pastoral<br>Central Pastoral<br>Northern Pastoral  | 2,629   | 27   | 168  | 98<br>195<br>88                                  | 338  | 0.2   | 338  | 44<br>144<br>22   | 55<br>17   |  |

/a Includes opportunity cost of the cattle herd

## TABLE 14b : SUMMARY OF FINANCIAL RESULTS FOR BEEF CATTLE FARM SECTOR

(\$ million)

| No. of Inputs F        | rom    |         | Outputs T | 00    |         | Value    |       |         |          |
|------------------------|--------|---------|-----------|-------|---------|----------|-------|---------|----------|
|                        | Cattle | Other   | /a        |       | Other   |          |       | Value   | Added/   |
|                        | (*000) | Sectors | External  | Total | Sectors | External | Total | Added   | Head (Ş) |
|                        |        | ·       |           |       |         |          |       |         |          |
| Total                  | 21,661 | 334     | 2,901     | 3,235 | 3,486   | 0        | 3,496 | 251     | 12       |
| North                  | 11.366 | 155     | 1,215     | 1,370 | 1,923   | 0        | 1,923 | 553     | 49       |
| South                  | 10 295 | 179     | 1,686     | 1,865 | 1,563   | 0        | 1,563 | (302)   | (29)     |
| Region                 |        |         |           |       |         |          |       |         |          |
| Western High Rainfall  | 409    | 8       | 63        | 71    | 78      | 0        | 78    | 7       | 17       |
| Western Wheat Sheep    | 429    | â       | 66        | 74    | 68      | õ        | 68    | (6)     | (13)     |
| Western Pastoral       | 221    | 2       | 22        | 24    | 27      | Ō        | 28    | 3       | 15       |
| Tasmania               | 458    | à       | 85        | 93    | 73      | 0        | 73    | (20)    | (43)     |
| Southern High Rainfall | 2 467  | 49      | 396       | 445   | 302     | õ        | 302   | (143)   | (58)     |
| Southern Wheat Sheen   | 2 697  | 49      | 509       | 558   | 417     | ő        | 41    | 15 16 1 | 541      |
| Southern Pastoral      | 171    | ŝ       | 48        | 51    | 58      | ö        | 5.8   |         | 15       |
| Eastern High Bainfall  | 515    | 5       | 40        |       | 50      | Ŭ        | 50    |         |          |
| - Tablelands           | 1 130  | 20      | · 1.32    | 212   | 201     | n        | 201   | (10)    | (8)      |
| Eastern High Bainfall  | 1 000  | 20      |           |       | - / 2   | •        |       | 1207    |          |
| - Coast                | 688    | 10      | 99        | 109   | 80      | 0        | 80    | :29)    | (42)     |
| Northern Wheat Sheed   |        | 10      | •••       |       |         | •        |       | (27)    |          |
| - South                | 1 222  | 20      | 206       | 226   | 262     | 0        | 262   | 36      | 29       |
| Northern Wheat Sheep   |        |         | 100       |       | - / -   | -        |       | • •     |          |
| - North                | 2 646  | 43      | 447       | 4:20  | 695     | Û        | 595   | 204     | 77       |
| North Eastern Mixed    | 3 775  | 60      | 442       | 502   | 6.17    | 0        | 647   | 145     | 38       |
| North Eastern Pastoral | 1 006  | 11      | 47        | 98    | 140     | 0        | 140   | 42      | 42       |
| Central Pastoral       | 2 629  | 27      | 164       | 195   | 338     | ů.       | 338   | 144     | 55       |
| Northern Pastoral      | 1 310  | 1.4     | 71        | 85    | 105     | Ő        | 103   | 19      | 14       |

a/ Opportunity cost of the cattle herd

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(iii) In the cattle industry the regions which sell the largest value of outputs to other sectors (i.e. feedlot, abattoir, export) are, in order of importance:-

|                              | <u>% of Total Farm Output Value</u><br><u>to Other Sectors</u> |
|------------------------------|--|
| Northern Wheat Sheep - North | 18.9   |
| North Eastern Mixed          | 18.0   |
| Southern Wheat Sheep         | 12.6   |
| Southern High Rainfall       | 10.8   |
| Central Pastoral             | 9.1  |

These are the regions in which cost-reduction measures would have the greatest impact, and where efforts to boost production would have the greatest impact on downstream industry sectors. It is notable that the Southern High Rainfall and Southern Wheat Sheep regions together produce about 40% of total farm sector output value, but their contribution of inputs to the downstream sectors is only 23% and reflects their contribution to dairying.

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#### Sheep

. , The total value of outputs from the sheep industry is \$2.98 billion, of which \$2.37 billion is wool and \$606 million is livestock products. Tables 15a and 15b summarise the sheep farm sector's costs, income and value added on a regional basis for both the whole sheep industry and the prime sheep industry respectively. The main points are:-

(i) In the sheep industry the main input purchasing regions in order of importance are:-

|                              | <u>% of Total Input Value</u> |
|------------------------------|-------------------------------|
| Southern Wheat Sheep         | 41.9                          |
| Western Wheat Sneep          | 19.8                          |
| Southern High Rainfall       | ï4.2                          |
| Northern Wheat Sheep - South | 4.7                           |
| Southern Pastoral            | 4.4                           |

(ii) In the sheep industry the regions which sell the largest value of outputs to other sectors (i.e. abattoir, export) in order of importance are:-

|                                    | % of Total Output Value |
|------------------------------------|-------------------------|
|                                    | to Other Sectors        |
| Southern Wheat Sheep               | .44.1                   |
| Southern High Rainfall             | 21.9                    |
| Western Wheat Sheep                | 12.0                    |
| Eastern High Rainfall - Tablelands | 5.3                     |
| Northern Wheat Sheep - South       | 5.0                     |

#### 4.1.4 Cost of Producing Beef and Sheepmeats

The average cost (including opportunity cost of the cattle on farm) of producing beef when factoring out the costs associated with dairying (Table 14b) is:-

Beef \$2.01 per kg dressed weight.

[Note this is different to how the last update (April 1993) calculated average cost, where an allocation of costs were proportioned through revenue contribution.]

The average cost (including opportunity cost of the sheep on farm) of producing sheepmeat was worked out by weighting the costs associated with wool production in proportion to revenue contribution and is as follows:-

Sheepmeat \$0.82 per kg dressed weight.

[Note this figure is worked out the same way as the last update (April 1993).]

Regional variations in beef and sheepmeat production costs, adjusted to exclude milk and wool production costs, are shown in Table 16.

# TABLE 15a : SUMMARY OF FINANCIAL RESULTS FOR SHEEP FARM SECTOR

(\$ million)

| No. ofInputs Fr        |                 | Outputs To       |          |       | Value            |          |       |                |                    |
|------------------------|-----------------|------------------|----------|-------|------------------|----------|-------|----------------|--------------------|
|                        | Sheep<br>('000) | Other<br>Sectors | External | Total | Other<br>Sectors | External | Total | Value<br>Added | Added/<br>Head (S) |
|                        |                 |                  |          |       |                  |          |       |                |                    |
| Total                  | 139,312         | 82               | 3,124    | 3,206 | 606              | 2,373    | 2,979 | (227)          | (2)                |
| Region                 |                 |                  |          |       |                  |          |       |                |                    |
| Western High Rainfall  | 1,879           | 1                | 36       | 37    | 21               | 34       | 55    | 18             | 10                 |
| Western Wheat Sheep    | 26,946          | 16               | 619      | 634   | 72               | 471      | 544   | (90)           | (3)                |
| Western Pastoral       | 3,887           | 1                | 48       | 49    | Э                | 51       | 60    | 10             | з                  |
| Tasmania               | 4,256           | 2                | 94       | 96    | 12               | 67       | 79    | (17)           | (4)                |
| Southern High Rainfall | 22,157          | 16               | 443      | 459   | 133              | 387      | 520   | 60             | 3                  |
| Southern Wheat Sheep   | 43,853          | 28               | 1,308    | 1,336 | 267              | 767      | 1.034 | (301)          | (7)                |
| Southern Pastoral      | 8,332           | 5                | 138      | 143   | 19               | 163      | 181   | 38             | 5                  |
| Eastern High Rainfall  |                 |                  |          |       |                  |          |       |                |                    |
| - Tablelands           | 6,757           | 4                | 128      | 132   | 32               | 115      | 147   | 14             | -                  |
| Eastern High Rainfall  |                 |                  |          |       |                  |          |       |                |                    |
| - Coast                | 58              | 0.03             | 1        | 1     | 0.4              | 1        | 1     | 0.2            | 3                  |
| Northern Wheat Sheep   |                 |                  | -        |       |                  |          |       |                |                    |
| - South                | 7,179           | 4                | 147      | 151   | 30               | 119      | 150   | 1              | (0.2)              |
| Northern Wheat Sheep   |                 | -                |          |       |                  |          |       |                |                    |
| - North                | 4,065           | 2                | 75       | 77    | 5                | 67       | 73    | (4)            | (1)                |
| North Eastern Mixed    |                 | 0.01             | 0.3      | 0.3   | 0.05             | 0.3      | 0.3   | 0.07           | 3                  |
| North Eastern Pastoral | 5,268           | 1                | . 61     | 62    | 3                | 74       | 78    | 15             | 3                  |
| Central Pastoral       | 3,953           | 1                | 28       | 29    | 3                | 55       | 58    | 29             | 7                  |
| Northern Pastoral      | 0               |                  | 0        | 0     | <u>_</u>         | 0        | 0     | 0              | 0                  |

/a Opportunity Cost of Sheep flock

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# TABLE 15b : SUMMARY OF FINANCIAL RESULTS FOR PRIME SHEEP FARM

**SECTOR** (\$ million)

| No. ofInputs_Fr        | <u>om</u> |         | Outouts  | Ľ2    |         | Value    |       |        |          |
|------------------------|-----------|---------|----------|-------|---------|----------|-------|--------|----------|
|                        | Sheep     | Other / | a        |       | Other   |          |       | Value  | Added/   |
|                        | (.000)    | Sectors | External | Total | Sectors | External | Total | Added  | Head (S) |
|                        |           |         |          |       |         |          |       |        |          |
| IOCAL                  | .27,251   | 18      | 332      | 1.014 | 202     | 237      | 6U2   | (412)  | (15)     |
| Region                 |           |         |          |       | •       |          |       |        |          |
| Western High Rainfall  | 554       | 0.3     | 12       | 13    | :       | 5        | 12    | (1)    | (2)      |
| Western Wheat Sheep    | 2,639     | 2       | 131      | 133   | 25      | 23       | 49    | (84)   | (32)     |
| Western Pastoral       | 96        | 0       | 1        | 1     | 1       | 1        | 1     | 0.4    | 4        |
| Tasmania               | 583       | 0.3     | 15       | 16    | 7       | 5        | 12    | (4)    | (5)      |
| Southern High Rainfall | 5,174     | 4       | 145      | 149   | 50      | 54       | 142   | (7)    | (1)      |
| Southern Wheat Sheep   | 13,228    | 9       | 596      | 605   | 134     | 116      | 299   | (305)  | (23)     |
| Southern Pastoral      | 417       | 0.2     | 7        | 7     | ÷.      | 4        | 10    | 3      | 7        |
| Eastern High Rainfall  |           |         |          |       |         |          |       |        |          |
| - Tablelands           | 1,863     | 1       | 40       | 41    | 24      | 10       | 40    | (1)    | (0.3)    |
| Eastern High Rainfall  |           |         |          |       |         |          |       | • - •  |          |
| - Coast                | 21        | 0.01    | 0.5      | 0.5   | 3.3     | 0.2      | 0.5   | 0.01   | 0.5      |
| Northern Wheat Sheep   |           |         |          |       |         |          |       |        |          |
| - South                | 1,505     | 1       | 44       | 45    | 14      | 13       | 32    | (13)   | (8)      |
| Northern Wheat Sheep   |           |         |          |       |         |          |       |        | • • •    |
| - North                | 158       | 0.1     | 5        | 5     | 2       | 1        | 3     | (2)    | (10)     |
| North Eastern Mixed    | 3         | 0       | 0.04     | 0.04  | 6.44    | 0.02     | 0.06  | . 0.02 | 3        |
| North Eastern Pastoral | 10        | 0       | 0.1      | 0.1   | 0.1     | 0.1      | 0.2   | 0.1    | 5        |
| Central Pastoral       | 10        | 0       | 0.1      | 0.1   | 0.:     | 0.1      | 0.2   | 0.1    | 10       |
| Northern Pastoral      | 0         | . 0     | n        | 0     | )       | 0        | 0     | 0.     | 0        |

/a Opportunity Cost of Sheep :lock

|                                    | \$ per kg DWT |           |  |
|------------------------------------|---------------|-----------|--|
|                                    | Beef          | Sheepmeat |  |
|                                    |               |           |  |
| Total                              | 2.01          | 0.82      |  |
| North                              | 1.55          |           |  |
| South                              | 2.57          |           |  |
| Western High Rainfall              | 1.97          | 0.47      |  |
| Western Wheat Sheep                | 2.31          | 0.72      |  |
| Western Pastoral                   | 2.00          | 0.49      |  |
| Tasmania                           | 2.5 L         | 0.73      |  |
| Southern High Rainfall             | 3.22          | 0.76      |  |
| Southern Wheat Sheep               | 2.89          | 1.11      |  |
| Southern Pastoral                  | 1.96          | 0.44      |  |
| Eastern High Rainfall - Tablelands | 2.30          | 0.74      |  |
| Eastern High Rainfall - Coast      | 2.32          | 1.00      |  |
| Northern Wheat Sheep - South       | 1.92          | 0.69      |  |
| Northern Wheat Sheep - North       | 1.57          | 0.42      |  |
| North Eastern Mixed                | 1.67          | 0.50      |  |
| North Eastern Pastoral             | 1.43          | 0.20      |  |
| Central Pastoral                   | 1.24          | 0.17      |  |
| Northern Pastoral                  | 1.81          | -         |  |

#### TABLE 16 : ESTIMATED COST OF PRODUCING BEEF AND SHEEPMEATS BY FARM REGION (1991/92 - 1993/94) a/

a/ Includes opportunity cost of beef herd and sheep flock.

#### 4.1.5 Value Added

#### Cattle

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Table 14a shows that the cattle farm sector generates a total value added of about \$2.0 billion which is equal to:-

\$ 83 per head of cattle in the national herd,

- \$ 244 per head turned off, and
- \$ 1.17 per kg dressed weight produced.

When milk and milk production costs are excluded, total value added falls to about \$251 million or:-

- \$ 12 per head of cattle in the national beef herd,
- \$ 36 per head turned off, and
- \$ 0.16 per kg dressed weight produced.

On a regional basis the main contributors to total value added in the cattle farm sector and the beef cattle farm sector are:-

#### % of Total Value Added

% of Total Value Added-Specialist Beef

57.8 .

| Southern High Rainfall        | 30.4 | North Wheat Sheep - North | 81.3 |
|-------------------------------|------|---------------------------|------|
| North Eastern Mixed           | 23.3 | North Eastern Mixed       | 57.8 |
| Northern Wheat Sheep - North  | 9.9  | Central Pastoral          | 57.4 |
| Southern Wheat Sheep          | 9.8  | North Eastern Pasoral     | 16.7 |
| Eastern High Rainfall - Coast | 9.5  | North Wheat Sheep - South | 14.3 |

#### Sheep

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Table 15a shows that the sheep farm sector produced a negative total value added of about \$227 million which is equal to:-

- -2 per head of sheep in the national flock, \$
- \$ -6 per head turned off, and
- \$ -0.29 per kg dressed weight produced.

After making an adjustment for the costs and income from wool production, total value added falls to negative \$46 million which is equal to:-

\$ -0.3 per head of sheep in the national flock,

- \$ -1 per head turned off, and
- \$-0.06 per kg dressed weight produced.

On a regional basis the main contributors to total value added in the sheep farm sector are:-

Total Value Added (\$million)

| Southern High Rainfall | 60 |
|------------------------|----|
| Southern Pastoral      | 38 |
| Central Pastoral       | 29 |
| Western High Rainfall  | 18 |
| North Eastern Pastoral | 15 |

The Southern Wheat Sheep region with 32 percent of the national flock recorded the largest negative value adding (-\$301 million).

#### 4.2THE CATTLE FEEDLOT SECTOR

#### 4.2.1General

The cattle feedlot sector has again grown in significance since the last update. The feedlot sector produced 10% of turnoff produced, 14% of the quantity (in dressed weight terms) and 18% of the value of beef produced in Australia.

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The feedlot sector has been divided for analytical purposes into two subsectors, domestic and export. The main characteristics of these subsectors are:-

| •                                      | Domestic | Export |
|--|----------|--------|
| Average 1991/94 throughput ('000 head) | 194.9    | 605.6  |
| Average weight in (kg dwt)             | 151.0    | 242.0  |
| Average weight out (kg dwt)            | 210 0    | 360.0  |
| Average days on feed (No.)             | 75.0     | 130.0  |
| Feed consumption per day (kg)          | 91       | 11.7   |
| Total feed consumed per head (kg)      | 680 0    | 1520.0 |

The cattle feedlot sector, although rurally based, differs from the farm sector in a number of important aspects. It is mainly under corporate as opposed to individual control; foreign ownership is common; vertical integration with the processing and marketing sectors is strong; and it is much more profit oriented than the farm sector and adopts technology rapidly.

#### 4.2.2 Linkages With Other Sectors

Tables 1 and 5 show that in physical and financial terms the feedlot sector has a backward linkage to the farm sector through the purchase of \$431 million worth of feeder cattle, and a forward linkage to the abattoir sector through the sale of finished cattle valued at \$721 million. External outputs from manure sales total about \$9 million. Inputs from external sources total about \$246 million, 87% of which is feed: The major difference since the last update is the increased number of cattle being fed for the export market (76% 91/94 compared with 55% 89/90). Table 17 breaks down the external costs for the two beef feedlot subsectors.

| (\$ million)     |  |   |  |  |  |
|------------------|--|---|--|--|--|
| Total <u>a</u> / | % of Total<br><u>C</u> ost   | Export<br>Subsector   | Domestic<br>Subsector  |  |  |
| 7.7              | 3.1  | 6.3   | 1.4  |  |  |
| 0.8              | 0.3  | 0.6   | 0.2  |  |  |
| 212.9            | 86.4   | 189.5   | 23.4   |  |  |
| 7.5              | 3.0  | 6.6   | 0.8  |  |  |
| 1.3              | 0.5  | 1.2   | 0.1  |  |  |
| 3.2              | 1.3  | 2.8   | 0.4  |  |  |
| 2.2              | 0.9  | 1.8   | 0.4  |  |  |
| 3.2              | 1.3  | 2.6   | 0.6  |  |  |
| 4.0              | 1.6  | 3.2   | 0.7  |  |  |
| 3.7              | 1.5  | 3.0   | 0.7  |  |  |
| 246.5            | 99.9   | 217.7   | 28.7   |  |  |
|                  | (\$ m<br>Total a/<br>7.7<br>0.8<br>212.9<br>7.5<br>1.3<br>3.2<br>2.2<br>3.2<br>4.0<br>3.7<br>246.5 | $(\$ \text{ million})$ $Total \underline{a}/ \% \text{ of Total} Cost$ $7.7  3.1 \\ 0.8  0.3 \\ 212.9  86.4 \\ 7.5  3.0 \\ 1.3  0.5 \\ 3.2  1.3 \\ 2.2  0.9 \\ 3.2  1.3 \\ 4.0  1.6 \\ 3.7  1.5 \\ 246.5  99.9$ | (\$ million)          Total a/       % of Total<br>Cost       Export<br>Subsector         7.7       3.1       6.3         0.8       0.3       0.6         212.9       86.4       189.5         7.5       3.0       6.6         1.3       0.5       1.2         3.2       1.3       2.8         2.2       0.9       1.8         3.2       1.3       2.6         4.0       1.6       3.2         3.7       1.5       3.0 |  |  |

#### TABLE 17 : EXTERNAL INPUTS PURCHASED BY THE CATTLE FEEDLOT SECTOR

a/ Differences due to rounding.

Processing costs include labour and machinery costs associated with the intake and exit of animals from feedlots. Feed costs include payments for grain, roughage, vitamin and mineral additives and freight costs associated with delivery. Grain and roughage processing costs include costs of hammermilling and mixing feed. Feeding out includes costs of labour and machinery. Surveillance includes costs of labour involved with daily observation and veterinary care of animals. Repairs and maintenance includes expenses for maintaining feedlots in good working order. Administration includes labour costs associated with bookkeeping and other managerial tasks. Overheads include interest on debt and working capital, electricity, water, etc.

The two feedlot subsector models - domestic and export - represent commercial feedlots whose sole activity is cattle finishing. The models do not reflect "opportunity feedlots" which are usually part of mixed farming activities and do not have the same cost structures as large commercial feedlots.

Table 18 shows the physical and financial transactions for local and export feedlots, and demonstrates the importance of the export feedlots. Export feedlots use 88% of the total inputs by value, 76% of the feeder stock, 89% of the feed, and produce 84% of the total beef and generated 85% of the total income. This suggests that R&D investments for the feedlot sector should mainly target export feedlots.

Table 18 also shows that the feedlot sector uses about 1,054,000 tonnes of feed and therefore represents a significant customer of the grains industry.

| <b>TABLE 18 :</b> | SUMMARY | OF PHYSICA | L AND  | FINANCLAL | RESULTS | FOR |
|-------------------|---------|------------|--------|-----------|---------|-----|
|                   | CA      | ATTLE FEED | LOT SE | CTOR      |         |     |

| A. PHYSICAL     |                       |                           |                 |                |                 |                          |       |                    |                         |  |
|-----------------|-----------------------|---------------------------|-----------------|----------------|-----------------|--------------------------|-------|--------------------|-------------------------|--|
| Inputs          |                       |                           | QUECUES         | 1              |                 |                          |       |                    |                         |  |
| Subsector       | Feeders<br>(No. 1000) | Feedera<br>('UOO c D'শা') | Feed<br>(t'000) | Local<br>Fed / | Lot<br>•000•    | Export Lot<br>Fed (1900) | Lieni | Weight (<br>Export | <u>'900 tl</u><br>Total |  |
| Total           | 796                   | 176                       | 1,054           | 1              | 25              | 5116                     | 41    | 317                | 258                     |  |
| Local Feedlot   | 194                   | 39                        | 133             | 1              | .95             | •                        | 41    | -                  | 41                      |  |
| Export Feedlot  | 603                   | 147                       | 921             |                | -               | ×0×                      | •     | 217                | 258                     |  |
| B. FINANCIAL (S | million)              |                           |                 |                |                 |                          |       |                    |                         |  |
| Cattle          | Inputs Fr             | on                        |                 | Jucouts T      | 0               |                          | Value |                    |                         |  |
| Subsector       | Throughput<br>('000)  | Other<br>Sectors          | Excernal        | Total          | Other<br>Sector | s External               | Iotal | Value<br>Added     | Added/<br>Head (\$)     |  |
| Total           | 796                   | 431                       | 246             | 678            | 721             |                          | 730   | 52                 | 66                      |  |
| Local Feedlot   | 194                   | 68                        | 29              | 97             | 107             |                          | 109   | 12                 | 60                      |  |
| Export Feedlot  | 603                   | 363                       | 219             | 580            | 514             |                          | 622   | 41                 | 68                      |  |

### 4.2.3 Cost of Production

The cost of producing beef in feedlots is estimated as follows:-

|                                     | <u>Local</u><br>Feedlot | Export<br>Feedlot |
|-------------------------------------|-------------------------|-------------------|
| Average weight in (kg dwt)          | 151                     | 242               |
| Average weight out (kg dwt)         | 210                     | 360               |
| \$ per kg in                        | 2.32                    | 2.48              |
| \$ per kg out                       | 2.63                    | 2.83              |
| Beef producec per head (kg dwt)     | 59                      | 118               |
| Total feedlot costs per head (\$)   | 148                     | 361               |
| Total costs per incremental kg (\$) | 2.51                    | 3.06              |
| (excluding purchase price)          | 0.00                    | 0.60              |
| (including purchase price)          | 2.58                    | 2.68              |

#### 4.2.4 Value Added

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Table-18 shows that the feedlot sector contributed a total average value added of about \$53 million per year between 1991/92 and 1993/94. This is only 2% of the total cattle industry value added, although further value is added to feedlot-produced carcases in downstream sectors. Almost 78% of the value added comes from export feedlots where value added is about \$68 per head (\$209 89/90) compared with \$60 per head (\$42 89/90) for local feedlots. The change indicates how the margins have narrowed significantly in the export feedlot sector.

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## 5. PROCESSING SECTORS

#### 5.1 THE ABATTOIR SECTOR

#### 5.1.1 Introduction

Most abattoirs in Australia process both sheep and cattle, and a number process pigs as well. The exceptions are the large northern beef export abattoirs and a small number of sheep - only abattoirs in south-eastern Australia. The value chain model estimates separate costs and returns for processing sheep and cattle. Sheep and cattle slaughtering are therefore analysed as separate activities even though they are often carried out in the same abattoir.

The abattoir sector experiences widely fluctuating fortunes depending on the difference between livestock and meat prices. The model provides a picture of the situation in 1991/92 - 1993/94 which is not necessarily representative of the total industry situation over a longer period.

There are three types of abattoirs processing livestock for human consumption:-

- Export abattoirs, licensed and supervised by the Australian Quarantine Inspection Service (AQIS) of the Commonwealth Department of Primary Industry and Energy (DPIE). Export abattoirs are automatically approved to supply meat for Australian consumption in all States.
- (ii) Local abattoirs, constructed in accordance with the Australian Code of Practice for Construction and Equipment of Abattoirs and operated under the supervision of meat inspectors employed by the various State authorities. Local abattoirs complying with the Code are registered as Approved Interstate Trading Establishments and are free to trade in all States.
- (iii) Local abattoirs approved and licensed by State authorities to process livestock for local (within State) consumption only.

#### 5.1.2 Cattle Abattoirs

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The cattle abattoir sector can be divided into two subsectors - export abattoirs (cattle only and mixed cattle/sheep) and mixed domestic cattle/sheep abattoirs. The small local abattoirs (slaughterhouses) are not significant with respect to total throughput, and do not warrant inclusion in the cattle model. The sheep component of the mixed beef/sheep abattoirs :s discussed separately under the sheep model.

For the purposes of the 1991/92-1993/94 update expert and domestic cost figures have been derived from recent benchmarking studies undertaken by the MRC for both cattle and sheep.

#### Export Abattoirs Processing Cattle Only

Almost all export abattoirs use on-the-rail dressing systems, with the hide removed by mechanical hide puller, and employees working from fixed positions along the chain. The type and number of hide pullers, the arrangement of associated equipment, and the number of slaughtermen which can be accommodated on the chain, determine plant production rates.

The capacity of Australian export beef plants ranges from around 200 head to over 1,200 head per day. The average capacity of the majority of plants is about 400 head per day.

A "tally" system is used to determine the number of slaughtermen employed on the chain for any given daily throughput. The tally for a plant is influenced by the layout of the dressing floor and its equipment. For example a beef dressing floor using an upward hide puller has a different tally to that of a floor using a downward hide puller.

In the model, data has been collected from a number of sites operating under various award and tally agreements. A tally system for the boning room is also in operation in Australian sites, with sides of beef assigned tally based on weight

### Mixed Domestic Beef/Sheep Abattoirs Processing Cattle

A few of the 160 larger domestic abattoirs have daily capacities as large as some of the export abattoirs. However, a more typical example of a large domestic abattoir is a daily kill in the order of 120 to 140 head of cattle and 1,200 to 1,400 smallstock, with the smallstock kill including sheep, lamb, pigs and, in some plants, goats. In some cases these larger domestic abattoirs are publicly-owned operations.

The major difference between the export and the large domestic abattoirs is that domestic abattoirs usually sell bone-in carcases. This reduces the need for large boning rooms and extensive freezing systems. Also, some of the trade is on the basis of a fee for service with the abattoir returning the carcase, edible offal and hide to the owner for marketing. As a result of a reduced level of activities, most domestic abattoirs tend to have smaller boning room, freezer and by-products operations. This is reflected in a lower use of services and a smaller labour force.

The operation of all domestic abattoirs is controlled by the relevant State Authorities. This can extend to limiting the daily, weekly or monthly production to a figure specified in the operating licence by the Authorities.

Licensing systems for the construction and operation of abattoirs are in force in all States, but there has been a recent trend towards a relaxation of the previously rigid licensing conditions and many public (State-owned) abattoirs are now privately owned and operated. In considering the capacity for the mixed domestic beef/sheep abattoir model, an allowance has been made for these changes by selecting a slightly higher throughput of 200 head of cattle and 1,200 smallstock per day.

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#### **External Inputs**

Table 19 illustrates the break down of external costs for the two types of abattoirs.

Labour costs include manning for yards, slaughter floor, boning room, by-product handling, administrative duties, etc. Along with differences in throughput, the higher labour cost in export abattoirs reflects the higher proportion of meat bonedout and packaged. Packaging costs include materials used for the export of boneless cuts, meat meal, other by-products and offals. Payments for services represent fuel, electricity and water. AQIS fees cover the meat inspection services. Consumables reflect costs of clothing, knives, etc., while general administration expenses cover advertising, accountancy, insurance and other costs which do not vary with production levels but have been assigned a per kilogram DWT breakup for consistency.

### TABLE 19 : EXTERNAL INPUTS PURCHASED BY THE CATTLE ABATTOIR SECTOR

(\$ million)

| Cost Item               | Total /a | % of<br>Total<br>Cost | Domestic | % of<br>Total<br>Domestic<br>Cost | Export | % of<br>Total<br>Export<br>Cost |
|-------------------------|----------|-----------------------|----------|-----------------------------------|--------|---------------------------------|
|                         |          |                       |          |                                   |        |                                 |
| Labour                  | 740.6    | 58.3                  | 140.7    | 61.1                              | 599.8  | 57.6                            |
| Packaging and Transport | 122.8    | 9.7                   | 3.0      | 1.3                               | 119.8  | 11.5                            |
| Services                | 95.4     | 7.5                   | 20.5     | 8.9                               | 74.9   | 7.2                             |
| AQIS                    | 42.4     | 3.3                   | 9.3      | 4.1                               | 33.0   | 3.2                             |
| AMLC/MRC                | 31.4     | 2.5                   | 10.0     | 4.3                               | 21.4   | 2.1                             |
| Interest                | 41.7     | 3.3                   | 6.8      | 3.0                               | 34.9   | 3.4                             |
| Consumables             | 12.3     | 1.0                   | 3.1      | 1.4                               | 9.2    | 0.9                             |
| Repairs and Maintenance | 141.4    | 11.1                  | 27.0     | 11.7                              | 114.4  | 11.0                            |
| General Administration. | 43.3     | 3.4                   | 10.0     | 4.3                               | 33.4   | 3.2                             |
| Total                   | 1271.3   | 100.1                 | 230.4    | 100.1                             | 1040.8 | 100.1                           |

a/ Differences due to rounding.

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#### Linkages with Other Sectors

Tables 8, 31 and 32 in Annex 6 show in detail the inputs and outputs of the beef component for export and domestic abattoirs. The total cattle abattoir sector shows very strong forward and backward linkages with the other industry sectors:-

- (i) The cattle abattoir sector supplies \$5.21 billion in total outputs, of which 95% is sold to other sectors where further value is added. The value of products sold to other sectors is:-
  - \$ 235 million to OMP,
  - \$ 358 million to tanneries,
  - \$ 583 million to wholesalers,
  - \$ 916 million to retailers, and
  - \$2,837 million to exporters.
- (ii) The physical inputs and outputs include<sup>1</sup>:-

| Inputs          | Outputs                               |
|-----------------|---------------------------------------|
| 1,771,060 t DWT | 739,910 t DWT of boneless primals     |
| oflivestock     | 621,068 t DWT of other boneless beef  |
|                 | 410,082 t DWT of beef carcases        |
|                 | 61,141 t DWT of beef offals           |
|                 | 41,196 t DWT of other by-products     |
|                 | 569,498 t DWT of rendered by-products |
|                 | 6.9 million cattle hides              |
|                 | 1.1 million calf skins                |

Table 20 presents physical and financial transactions for local and export cattle abattoirs.

# TABLE 20 : SUMMARY OF PHYSICAL AND FINANCIAL RESULTS FORTHE CATTLE ABATTOIRS SECTOR

| . Subsector                          | Throughput<br>No.<br>('000) | Inputs<br>('000 t DWT) | Boneless<br>Primals<br>('000 t)<br>DWT | Boneless<br>Other<br>('000 t)<br>_DWT | Carcases<br>('000 t)<br>DWT | <pre>0ffals ('000t)Output</pre> | Other<br>By<br>Products<br>('000 t)<br>uts _DMT | Ca:tle<br>s Hi.les<br>) (')00) | Calf<br>Skins<br>('000)<br>DWT | Rendered<br>By-<br>Products<br>-('000 t)<br>DWT | ì | _ |
|--------------------------------------|-----------------------------|------------------------|--|---------------------------------------|-----------------------------|---------------------------------|---|--------------------------------|--------------------------------|---|---|---|
| Total                                | 8,062                       | 1,771                  | 740                                    | 621                                   | 410                         | 61                              | 41  | 6, 173                         | 1,089                          | 569   |   |   |
| <ul> <li>Export Abattoirs</li> </ul> | 5,370                       | 1,361                  | 740                                    | 621                                   | -                           | 53                              | 35  | 5,170                          | -                              | 498   |   |   |
| Domestic Abattoi                     | rs 2,692                    | 410                    | -                                      | -                                     | 410                         | 9                               | 6   | 1,503                          | 1,089                          | 72  |   |   |
| B. FINANCIAL (S                      | million)                    |                        |  |                                       |                             |                                 |   |                                |                                |   |   | _ |
| Cattle                               | CattleInouts From           |                        | Outputs To                             |                                       |                             | Value                           |   |                                |                                |   |   |   |
| Subsector                            | Through                     | out Other              |  |                                       | Other                       |                                 |   | Valu-                          | λdded/                         |   |   |   |
|                                      | ( 000)                      | Sectors                | External                               | Total                                 | Sectors                     | External                        | Tota.   | λdd <del>e</del> 1             | Head (\$)                      |   |   |   |
| Total                                | 8,062                       | 3,937                  | 1,271                                  | 5,208                                 | 4,929                       | 285                             | 5,214   | 6                              | 0.76                           |   |   | _ |
| Export Abattoirs                     | 5,370                       | 3.044                  | 1.041                                  | 4.084                                 | 3.848                       | 250                             | 4.099   | 14                             | 2.55                           |   |   |   |
| Domestic Abattoi                     | rs 2,692                    | 893                    | 230                                    | 1,123                                 | 1,081                       | 35                              | 1,116   | -8                             | -2.82                          |   |   |   |

Outputs are greater than inputs in terms of weight because lives ock inputs are specified as dressed weights. In fact, livestock enter the abattoir as liveweight with the difference in weight contributing to offals and by-products as outputs.

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The main differences between local and export abattoirs are:-

- External costs per head processed (excluding livestock) are estimated to be about \$194 for export abattoirs and about \$86 for domestic abattoirs. This difference reflects the extra labour and packing materials used in boning operations at export abattoirs, and the large proportion of calves in domestic abattoir throughput.
- (ii) When the cost of by-products recovered are deducted, the per head processing cost declines to \$40 in domestic abattoirs and \$67 in export abattoirs. By-products are worth about \$46 per head for domestic cattle (\$86-\$4()) and \$127 per head for export cattle (\$194-\$67).

### Value Added

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Total value added in the cattle abattoir sector is estimated to be about \$6 million. This reflects the generally low profits earned by abattoirs, and is the reason for the rationalisation that has occurred in recent years. Costs, income and value added per kg of carcase weight processed are estimated to be:-

|         |                   | <u>\$/kg DWT</u> |
|---------|-------------------|------------------|
| Costs   | - livestock       | 2.223            |
|         | - other costs     | 0.718            |
|         | - total costs     | 2.941            |
| Income  | - meat and offals | 2.560            |
|         | - by-products     | 0.384            |
|         | - tətal income    | 2.944            |
| Net Val | ue Added          | 0.003            |

Very small movements in livestock prices have a big impact on net value added in the cattle abattoir sector. For example, an increase in cattle prices of less than \$1 per head without a proportionate increase in beef prices would eliminate the 0.3 cent/kg margin, conversely a \$1 decrease in cattle prices would more than double the margin. Since the 1989/90 update cattle prices have increased six percent. Since short-term fluctuations of this magnitude are commonplace, and much larger fluctuations occur over longer periods, investment in the beef abattoir sector is highly risky. Whilst average returns can be reasonable in the long run, substantial financial resources are required to sustain operations during periods of low or negative returns.

# 5.1.3 Sheep Abattoirs

Almost all sheep are slaughtered in abattoirs which also process cattle. While sheep processing costs up to the point of a dressed carcase do differ between abattoirs, the major cost variations depend on whether abattoirs produce carcases for the domestic trade or bone carcases for export. The sheep abattoir model described as "mixed export" is assumed to bone out about 70% of carcases, whereas the "mixed domestic" sheep abattoir is assumed to process mainly lambs and only bone out about 18% of carcases. Over the entire sheep and lamb slaughtering sector, about 42% of animals slaughtered are boned out.

Tally systems are used to determine dressing chain and boning room manning, with the tally depending on the Industrial Award which is applicable to particular plants. As in beef plants, the tally only applies to skilled labour and the total number of employees is much greater than the employees on tally.

Traditionally, all plants processing sheep used on-the-rail dressing systems with the skin being removed manually from the carcase whilst it was suspended by the hind legs from a rail. A recent innovation is the inverted dressing system based on skin removal with the carcase suspended by the front legs. 'This has allowed the introduction of a number of mechanical skinning aids which, in turn, have resulted in increased tally. In some plants which have adopted the inverted dressing system, a tally in excess of 100 sheep per man per day has been negotiated. However, the greatest advantage of the inverted dressing system is the reduction in the number of unskilled labourers.

The model selected for both export and domestic processing has been based on benchmarking data that includes both the traditional and inverted dressing systems.

The processing speed on a sheep chain is generally set by the time needed to complete the inspection of carcases, heads and viscera. Most chains are capable of processing in excess of 3,000 sheep per day, but are limited to between 2,800 and 3,000 by the inspection requirements.

The breakdown of cost categories for domestic and export sheep abattoirs is shown in Table 21.

Details on each cost item are the same as those used in the beef abattoir model explained in Section 5.1.2.

| Cost Item               | Total /a | % of<br>Total | Export | % of<br>Total | Domestic | % of<br>Total |
|-------------------------|----------|---------------|--------|---------------|----------|---------------|
|                         |          | Cost          |        | Export        |          | Domestic      |
|                         |          |               |        | Cost          |          | Cost          |
|                         |          |               |        |               |          |               |
| Labour                  | 227      | 57.9          | 139    | 57.9          | 89       | 57.9          |
| Packaging and Transport | 19       | 5.0           | 9      | 3.9           | 10       | 6.6           |
| Services                | 33       | 8.5           | 25     | 10.3          | 9        | 5.7           |
| AQIS                    | 15       | 3.8           | 10     | 4.1           | 5        | 3.3           |
| AMLC                    | 18       | 4.5           | 6      | 2.6           | 12       | 7.5           |
| Consumables             | 8        | 2.0           | 5      | 2.2           | 3        | 1.7           |
| General                 | 28       | 7.2           | 17     | 7.0           | 12       | 7.7           |
| Interest                | 9        | 2.3           | 6      | 2.6           | 3        | 1.9           |
| Repairs                 | 35       | 8.8           | 23     | 9.5           | 12       | 7.8           |
| Total                   | 392      | 100.0         | 239    | 100.1         | 153      | 100.1         |

# TABLE 21 : EXTERNAL INPUTS PURCHASED BY THE SHEEP ABATTOIR SECTOR

(\$ million)

a/ Differences due to rounding.

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# Linkages With Other Sectors

Tables 5, 26 and 27 in Annex 7 show in detail the inputs and outputs for the export and domestic sheep abattoirs and for the total sheep slaughtering sector. The total cattle abattoir sector shows very strong forward and backward linkages with the other industry sectors:-

- (i) The sheep abattoir sector generates about \$1.09 billion in total outputs of which 96% pass forward to other sectors where further value is added. The values of products moving forward to other sectors are:-
  - \$ 125 million to OMP,
  - \$ 131 million to tanneries,
  - \$ 119 million to wholesalers,
  - \$ 269 million to retailers, and
  - \$ 405 million to exporters.

(ii) The physical inputs and outputs include<sup>1</sup>:-

Inputs

661,700 t DWT of livestock 298,546 t DWT of boneless meat 363,154 t DWT of sheep/lamb carcases 19,822 t DWT of sheep offals 33,085 t DWT of other by-products 94,312 t DWT of rendered by-products 13.1 million lamb skins 20.2 million sheep skins

Outputs

Table 22 presents physical and financial transactions for local and export sheep abattoirs and reveals some significant differences between the two sheep abattoir models. In particular:-

- External costs per head processed (excluding livestock) are estimated to be \$15.06 for export sheep abattoirs and \$8.83 for domestic sheep abattoirs This difference is due to higher boning room costs in the export operations.
- (ii) When the costs of skin and by-product recovery are deducted, the average cost of sheep processing falls to \$8.07 for export sheep abattoirs and \$2.48 for domestic sheep abattoirs. By-products are worth \$6.99 per head for export abattoirs (\$15.06-\$8.07) and \$6.35 per head for domestic abattoirs (\$8.83-\$2.48).

# TABLE 22 : SUMMARY OF PHYSICAL AND FINANCIAL RESULTS FOR THE SHEEP ABATTOIRS SECTOR

| λ. PHYSICAL        |                               |                       |                              |                     |                      |                         |                          |                           |                                     |  |
|--------------------|-------------------------------|-----------------------|------------------------------|---------------------|----------------------|-------------------------|--------------------------|---------------------------|-------------------------------------|--|
| 7. Subsector       | Throughput<br>No. (<br>{'000} | Inputa<br>(000 t DWT) | Boneless<br>Heat<br>('000 t) | Carcase<br>('000 t) | s Offals<br>('000 t) | By-Products<br>('000 t) | Sheep<br>Skins<br>('000) | Lamb<br>Skins H<br>('000) | Rendered<br>By-Products<br>('000 t) |  |
|                    | -                             |                       |                              |                     |                      | outputs _               |                          |                           |                                     |  |
| Total              | 33,239                        | 66:1                  | 299                          | 363                 | 20                   | 33                      | 20,186                   | 13,054                    | 94                                  |  |
| Export Abattoirs   | 15,898                        | 32:5                  | 231                          | 94                  | 10                   | 16                      | 12,635                   | 3,262                     | 57                                  |  |
| Domestic Abattoirs | 17,342                        | 33-7                  | 68                           | 269                 | 10                   | 17                      | 7,550                    | 9,791                     | 37                                  |  |
|                    |                               |                       |                              |                     |                      |                         |                          |                           |                                     |  |
| B. PINANCIAL (\$ m | illion)                       |                       |                              |                     | -                    |                         |                          |                           |                                     |  |
| Sheep              | Inputs From                   |                       | Output                       | s To                |                      |                         | · ·                      | Value                     | e                                   |  |
| Subsector          | Throughput                    | Other                 |                              | Ot                  | ther                 |                         | Valu                     | e Addeo                   | 4/                                  |  |
|                    | ('000)                        | Sectors               | External 1                   | Total <u>S</u> ec   | tors Ex              | ternal To               | tal Adde                 | d Head                    | (\$)                                |  |
| Total              | 33,239                        | 5::6                  | 392                          | 918 1.              | 048                  | 46 1.                   | 094 176                  | 5.3                       | 1                                   |  |
| Export Abattoirs   | 15,898                        | 2:1                   | 239                          | 440                 | 467                  | 28                      | 495 55                   | 3.49                      | 5                                   |  |
| Domestic Abattoirs | 17,342                        | 3::5                  | 153                          | 478                 | 581                  | 18                      | 599 122                  | 7.0                       | 1                                   |  |

<sup>1</sup> Outputs are greater than inputs in terms of weight because livestock inputs are specified as dressed weights. In fact, livestock enter the abattoir as liveweights with the difference in weight contributing to offals and by-products as outputs.

#### Value Added

Total value added in the sheep abattoir sector is estimated to be \$176 million, of which nearly 70 percent comes from domestic abattoir operations. Costs, income and value added per kg carcase weight processed are estimated to be:-

|         |                    | <u>\$/kg DWT</u> |
|---------|--------------------|------------------|
|         |                    |                  |
| Costs   | - livestock        | 0.794            |
|         | - other costs      | 0.593            |
|         | - votal costs      | 1.387            |
| Income  | - :neat and offals | 1.358            |
|         | - by-products      | 0.296            |
|         | - total income     | 1.654            |
| Net Val | ue Added           | 0.267            |

As with cattle, very small movements in costs or prices can have a big impact on the net value added in the sheep abattoir sector. Since the 89/90 update sheep prices have dropped more than 20 percent, this has had a major impact on the net value added.

# 5.2 THE OTHER MEAT PROCESSING (OMP) SECTOR

#### 5.2.1 General

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This sector represents a combination of meat processors, including those which produce:-

- pet food;
- sausages;
- emulsified products (frankfurts, devon, etc.);
- hamburgers; and
- other products (canned meats; continental smallgoods; corned, salted and roasted beef; and meat pies).

OMP as defined excludes boning rooms which operate independently from abattoirs. These boning rooms are considered as part of the abattoir sector, even though their location and ownership are separate.

# 5.2.2 Linkages with Other Sectors

# External Inputs

The cost of manufacturing processed and prepared meats was obtained by combining costs for producers of the products listed in Section 5.2.1. Table 23 shows the total costs for processing beef and sheepmeats into outputs from the OMP sector.

| Cost Item                      | Cattle | Sheep |  |
|--------------------------------|--------|-------|--|
| Raw Materials (Excluding Meat) | 66     |       |  |
| Labour                         | 16     | 16    |  |
| Services                       | 18     | 17    |  |
| Packaging                      | 26     | 41    |  |
| Transport                      | 9      | 14    |  |
| Overheads                      | 12     | 15    |  |
| Total                          | 147    | 183   |  |

### TABLE 23 : EXTERNAL INPUTS PURCHASED BY THE OMP SECTOR (\$ million)

These costs include the cost of manufacturing and incidentais, but not marketing expenses. An allowance for marketing expenses and other costs which do not vary with the level of output is made in overhead costs. Cost calculations are based on dressed weight (DWT) equivalents.

#### Cattle

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The cattle OMP sector purchases \$235 million worth of beef and beef by-products from the abattoir sector. This represents only 4.5% of the total value of abattoir outputs but, given the low margins earned by abattoirs, this is still an important source of income for the cattle abattoir sector. In physical terms, these purchases consist of the equivalent of 109,000 DWT tonnes of boneless beef, 1,300 DWT tonnes of offal and 41,200 DWT tonnes of "other by-products" (refer Table 7 for the composition of other by-products). Table 24 shows that total outputs from the sector are valued at \$477 million per year and consist of:-

|  | <u>Tonnes DWT</u>                             | <u> 3 Million</u>               |
|--|---|---------------------------------|
| Pet food<br>Sausages and smallgoods<br>All other'<br>Total | 163,229<br>62,544<br><u>32,175</u><br>257,948 | 156<br>202<br><u>119</u><br>477 |
|  |   |                                 |

<sup>1</sup> All other includes continental goods; corned, salted and roast beef: meat pies; canned meat products; and hamburger meat.

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# TABLE 24 : SUMMARY OF PHYSICAL AND FINANCIAL RESULTS FOR CATTLE OTHER MEAT PROCESSING SECTOR

| Outputs (t) DWT      |                   | _        |             |                        |                   |              |  |
|----------------------|-------------------|----------|-------------|------------------------|-------------------|--------------|--|
| ÷ ,                  | lnputs<br>(t DWT) | Sausages | Pet<br>Pood | Bmulsified<br>Products | Hamburger<br>Heat | All<br>Other |  |
| Boneless Beef        | 108,603           | 16,396   | 36,007      | 42,320                 | -                 | 30,045       |  |
| Other By-Products    | 41,196            | 3,827    | 123,464     | -                      | -                 | 1,957        |  |
| Offals               | 1,254             | -        | 3,758       | -                      | -                 | 171          |  |
| Total                | 151,063           | 20,324   | 163,229     | 42,320                 |                   | 32,175       |  |
| B. PINANCIAL (\$ mil | lion)             |          |             |                        |                   |              |  |
| Inputs Prom          |                   |          | Outputs To  |                        |                   |              |  |

|         | Inputs Prom |       |         | Outputs To | _     |       |  |  |
|---------|-------------|-------|---------|------------|-------|-------|--|--|
| Other   |             |       | Other   |            |       | Value |  |  |
| Sectors | External    | Tctal | Sectors | External   | Total | Added |  |  |
|         |             |       |         |            |       |       |  |  |
| 235     | 147         | 382   | 65      | 411        | 477   | 95    |  |  |

#### Sheep

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Table 25 shows that the sheep OMP sector purchased \$125 million worth of sheepmeat and sheepmeat by-products from the sheep abattoir sector. This represents 11% of sheep abattoir output, and consisted of the equivalent of 106,533 DWT tonnes of boneless mutton, 7,317 DWT tonnes of offal, and 33,085 DWT tonnes of other abattoir by-products.

Total outputs from the sheep OMP sector are valued at \$415 million and consist of:-

|   | ionnes             | <u>\$ Willion</u> |
|---|--------------------|-------------------|
| Sausages and other emulsified goods<br>Pet food | 60,586<br>1.52,266 | 196<br>143        |
| Other products                                  | 14,367             | 54                |
| Total   | 201,691            | 396               |

Includes canned meats; continental products; canned, salted and roast meats; and meat pies.

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A 3 C 111

|                                      |              |                            | 0                             | utputs (t)       |           |                   |                   |   |   |
|--------------------------------------|--------------|----------------------------|-------------------------------|------------------|-----------|-------------------|-------------------|---|---|
| 4                                    |              | Inputs<br>(t)              | Sausages                      | Pet<br>Food      | Emu<br>Pr | lsified<br>oducts | Other<br>Products |   |   |
| Boneless Mu<br>Offals<br>Other By-Pr | itton .      | 106,533<br>7,317<br>33,085 | 15,666<br>732                 | 66,384<br>10,965 | 2         | 4,049<br>5,017    | 14,364            |   | _ |
| Total<br>B. FINANCI                  | (AL (\$ mill | 88,259                     | 16,395                        | 152,266          |           | 4,191             | - 14,364          |   |   |
| Inputs From<br>Other<br>Sectors      | external     | Total                      | Outputs T<br>Other<br>Sectors | External         | Total     | \'a<br>J.c        | alue<br>dded      | _ |   |
| 125                                  | 183          | 307                        | 53                            | 343              | 396       |                   | 88                |   |   |

#### 5.2.3 Value Added

A. PHYSICAL

The shortage of reliable data on the OMP sector, the diversity of meat and non-meat ingredients used, and the necessarily large number of assumptions and "guesstimates", make the estimation of value added in the OMP sector less reliable than for the other sectors. Other meat processing is essentially a salvaging operation which converts otherwise unsaleable material into marketable products.

# 5.3 THE TANNERY SECTOR

#### 5.3.1 General

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Hides and skins are the most important single by-product of the abattoir sector. They contribute just under 45 percent of the total by-product income for cattle slaughtering and 60 percent of the by-product income for sheep. The tanning industry purchases raw hides from the cattle abattoir sector in fresh or salted/dried form and converts them to serai-processed forms or finished leather. However, some hides and most lamb and sheep skins, and call skins, are salted or dried and exported in unprocessed form. In many cases, abattoirs dry or salt sheep and lamb skins before export by dealers. The model includes this activity (drying/salting) in the tannery sector in order to estimate the value added. A new development in the sheep model is the emergence of the fellmongery sector where the wool is taken from the skin and further processing occurs.

#### 5.3.2 Cattle Hides

The various forms of cattle hides include green hides (ie. raw), salted or brine cured hides, dried hides, pickled hides, wet blue hides, crust leather and finished leather. The model analyses the conversion of green hides to salted or dried hides; to wet blue hides; and to finished leather. The quantity of hides converted to other forms is not significant and is not included in the model.

Hides are cured at abattoirs by stack salting, brine curing or drum salting. Salted hides are then converted to semi-processed or finished leather, or exported to overseas tanneries. An increasing number of green hides are being processed directly to the wet blue stage to avoid the

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overseas tanneries. An increasing number of green hides are being processed directly to the wet blue stage to avoid the cost of salting. This has resulted in the construction of wet blue plants in close proximity to abattoirs. The wet blue process is capital-and not labour-intensive and prices are competitive on the world market.

Table 26 breaks down the external inputs to the cattle tannery sector. Wet blue operating costs include labour, freight-in, chemicals, services, handling, packaging, repairs and maintenance, selling costs and freight-out. Wet blue fixed costs include supervision, administration, debt and working capital interest, insurance, etc.. Leather processing costs include wet blue hide costs, freight-in, chemicals, labour, services, etc.. Fixed cost items are similar to those for wet blue operations.

# TABLE 26 : EXTERNAL INPUTS PURCHASED BY THE CATTLETANNERY SECTOR

|        | Cost Items    | Cost<br>(\$ million) | % of Total |  |
|--------|---------------|----------------------|------------|--|
| -<br>- | Freight       | 3.1                  | 1.9        |  |
|        | Processing    | 82.2                 | 50.3       |  |
|        | Shipping      | 10.4                 | 6.4        |  |
|        | Commission    | 10.9                 | 6.7        |  |
|        | Selling Costs | 2.2                  | 1.4        |  |
|        | Labour        | 42.0                 | 25.7       |  |
|        | Overheads     | 12.6                 | 7.7        |  |
|        | Total         | 163.4                | 100.1      |  |

(\$ million)

Just over 20 percent of hides are processed to the finished leather stage - the remainder are exported unprocessed, or semi-processed to the wet blue stage (19%) and then exported.

Table 27 shows that tanners purchase almost all the cattle hides produced by the abattoir sector at a total cost of \$358 million. All sales are external and total \$606 million which represents 6% of the external income generated by the cattle and beef industry.

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|                 |              |                   |                     |       | Outputs              |                              |                 |   |
|-----------------|--------------|-------------------|---------------------|-------|----------------------|------------------------------|-----------------|---|
| Inputs          | ('000 hides) | Wet Blue<br>Hides | Finished<br>Leather |       | Salted Calf<br>Skins | Salted<br>Hid <del>e</del> s | Total<br>Pieces |   |
|                 |              | (*000)            | ('000)              |       | ('000)               | ('000)                       | ('000)          |   |
| Raw Cattle Hide | a 6,973      | 1,523             | 1,635               |       | -                    | 3,815                        | 6,973           |   |
| Raw Calf Skins  | 1,089        | -                 | -                   |       | 1,089                | -                            | 1,089           |   |
| Total           | 8,062        | 1,523             | 1,635               |       | 1,089                | 3,815                        | 8,062           |   |
| B. FINANCIAL (  | \$ million)  |                   |                     |       |                      |                              |                 |   |
| Inputs From     |              | Outputs T         | 6                   |       |                      |                              |                 | • |
| Other           |              | Other             |                     |       | Valu                 |                              |                 |   |
| Sectors Exte    | rnal Total   | Sectors           | External            | Total | Adde                 | d                            |                 |   |
| 359 14          | 3 571        |                   | 606                 | 606   | 85                   |                              |                 |   |

# TABLE 27 : SUMMARY OF PHYSICAL AND FINANCIAL RESULTS FOR CATTLE TANNERY SECTOR

The cattle tannery sector generates net added value of \$85 million in the process of transforming raw hides worth \$358 million to manufactured products worth \$606 million.

# 5.3.3 Sheep Skins

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Utilisation of Australian sheepskins has been based on the wool recovered from the skin. Currently the vast majority of skins are exported in a dried or salted condition where the prime objective is wool recovery. Sheep and lamb skins can be divided into six categories:-

- (i) Air Dried.
- (ii) Drum Salted.
- (iii) Pickled.
- (iv) Tanned Wool-On.
- (v) Tanned Wool-Off.
- (vi) Fellmongered (wool removal).

Table 28 shows the average external input costs of the various skin processing techniques. All costs are similar to those detailed for the cattle tannery sector.

| Cost Items           | Cost<br>(\$ million) | % of Total |
|----------------------|----------------------|------------|
| Processing           | 45.4                 | 37.7       |
| Shipping             | 10.5                 | 8.7        |
| Commission           | 9.3                  | 7.7        |
| Freight and Handling | 7.5                  | 6.2        |
| Packaging            | 2.7                  | 2.2        |
| Labour               | 32.4                 | 26.9       |
| Overheads            | 12.6                 | 10.5       |
|                      |                      |            |
| Total                | 120.4                | 99.9       |
|                      |                      |            |

# TABLE 28 : EXTERNAL INPUTS PURCHASED BY THE SHEEP TANNERY SECTOR

(\$ million)

Table 29 shows that the sheep tannery sector (which includes salting and drying activities) purchases skins worth \$131 million from the sheep abattoir sector. Average price for skins was just under \$4 for both lamb and sheep skins (cf. \$5.50 89/90). Just over 10% of skins are now fellmongered onshore and this trend seems set to continue.

All sales from the sheep tannery sector are external (ie. to consumers outside the meat and livestock industry) and amount to \$277 million. This represents 10% of total external non-wool income for the sheep industry. The sheep tannery sector generates net value added of \$25 million in the process of transforming raw material worth \$131 million to preserved and manufactured products worth \$277 million.

### TABLE 29 : SUMMARY OF PHYSICAL AND FINANCIAL RESULTS FOR SHEEP TANNERY SECTOR

| A. PHYSICAL               |                        |                                   |                                |                              |                          |                           |                                   |
|---------------------------|------------------------|-----------------------------------|--------------------------------|------------------------------|--------------------------|---------------------------|-----------------------------------|
|                           |                        | Outpu                             | Its                            |                              |                          |                           |                                   |
|                           | Inputs<br>('000 skins) | Nool on<br>Tanned Skins<br>('000) | Pellmongere<br>Skins<br>('000) | ed Salted<br>Skins<br>('000) | Dried<br>Skins<br>('000) | Total<br>Pieces<br>('000) | Pellmongered<br>Wool<br>('000 kg) |
| Sheep skins<br>Lamb skins | 20,186<br>13,054       | 1,817<br>1,501                    | 2,321<br>992                   | 5,470<br>1,438               | 6,782<br>6,083           | 16,390<br>13,014          | 3,250<br>1,389                    |
| Total                     | 3.1,239                | 3,318                             | 3,313                          | 9,908                        | 12,866                   | 29,405                    | 4,639                             |

B. FINANCIAL (\$ million)

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|         | Inputs From |       |         | Outputs To |       |       |  |
|---------|-------------|-------|---------|------------|-------|-------|--|
| Other   |             |       | Other   |            |       | Value |  |
| Sectors | External    | Total | Sectors | External   | Total | Added |  |
| 131     | 120         | 251   | -       | 277        | 277   | 25    |  |

# 6. MARKETING SECTORS

#### 6.1 THE WHOLESALE SECTOR

#### 6.1.1 General

Meat wholesalers provide a link between abattoirs and retail butcher shops. The model treats the wholesale sector as a "buyer" of meat from the abattoir sector. In reality there is often no change in ownership between the two sectors as some wholesalers purchase livestock and process them through service abattoirs. In order to calculate value added in the abattoir sector, it was necessary to estimate a transfer price between the abattoir and wholesale sectors (and between abattoirs and exporters where the same principles apply). Only in New South Wales where there is a wholesale meat market can these prices be estimated, and in the absence of other reliable information these prices were used for the sector as a whole. Operating costs include all freight, labour and packaging.

The wholesale sector handles carcases which it buys from abattoirs and delivers to food service outlets, butcher shops and supermarkets. For beef, about a third of the value of wholesale turnover is boneless beef. About two-thirds of wholesale sales are to the food service sector (restaurants, fast food outlets, institutions etc). One-third of the beef trade therefore consists of sales of beef to retail butchers and supermarkets. Two-thirds of sheepmeat wholesaling consists of lamb carcases.

#### 6.1.2 Beef Wholesaling

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Table 30 shows the estimated physical and financial transactions for the beef wholesale sector. Wholesalers buy \$583 million worth of heef from the abattoir sector. About \$101 million of this is beef carcases and offals and the remainder boneless beef. The total quantity of beef handled by wholesalers is estimated to be 220,000 tonnes (DWT).

Beef sales from wholesalers to retailers are estimated to total about \$239 million, and to the food service operators about \$470 million. Total sales of \$710 million represent an average 22% mark-up on ex-abattoir prices.

Wholesalers add value to beef by boning out, storing, transporting it to butchers, and combining beef from different sources so that butchers obtain the mix of products their customers demand. This basic trading activity adds 22% to the exabattoir value of beef and generates a net value added of \$24 million, or 1% of beef industry value added.

#### 6.1.3 Sheepmeat Wholesaling

Table 31 shows estimated transactions between the sheepmeat wholesale sector and other sectors. Wholesalers buy about \$119 million worth of sheepmeat from the

abattoir sector with the majority in carcase form. The cost of meat inputs represent 91% of total wholesaler costs.

Sheepmeat sales from wholesalers to retailers total \$115 million. Sheepmeat worth \$35 million is sold by wholesalers to the food service sector.

# TABLE 30 : SUMMARY OF PHYSICAL AND FINANCIAL RESULTS FOR THE BEEF WHOLESALE SECTOR

|                 |          |       |              |                  | Outpu    | its (t)    |                         |                     |                  | •    |
|-----------------|----------|-------|--------------|------------------|----------|------------|-------------------------|---------------------|------------------|------|
|                 | Ir<br>(t | DWT)  | Bon<br>Prima | eless<br>L Other | Carcases | Offal      | Other<br>Retail<br>Heat | Bones<br>and<br>Pat | Totaj<br>Outputs |      |
| Boneless Primal | s 12     | 2,713 | 49,944       |                  | -        | -          | 72,769                  | -                   | 122,713          |      |
| Boneless Other  | 55       | 5,896 | -            | 55,896           | -        | -          | -                       | -                   | 55,896           |      |
| Carcases        | 4        | L,506 | -            | -                | 18,553   | -          | 19,757                  | 9,517               | 41,506           |      |
| Offals          |          | 887   | -            | -                | -        | 887        | -                       | -                   | 863              |      |
| Total           | 22       | 1,002 | 49,944       | 55,896           | 18,553   | 887        | 92,526                  | 9,517               | 221,002          | <br> |
| B. PINANCIAL    | \$ mill: | Lon)  |              | •                |          | <b>.</b> . |                         |                     |                  | -    |
| Inputs From     |          |       | 0            | utputs To        | )        |            |                         | v. v.               |                  |      |
| Other           |          | -     |              | Other            |          |            | 1-a                     | lue                 |                  |      |
| Sectors Exte    | rnal     | Total | S            | ectors           | External | Total      | λđ                      | ded                 |                  |      |
| E 82 1/         |          | 606   |              | 220              | 170      | 700        |                         | 24                  |                  |      |

# TABLE 31 : SUMMARY OF PHYSICAL AND FINANCIAL RESULTS FOR THE SHEEP WHOLESALE SECTOR

A. PHYSICAL

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|           |              |                     |                    | Outpu              | its (t)          |                         |                     |                  |   |
|-----------|--------------|---------------------|--------------------|--------------------|------------------|-------------------------|---------------------|------------------|---|
|           |              | Inpucs<br>(t) (DWI) | Retail<br>Bonaless | Retail<br>Carcases | Retail<br>Offals | Other<br>Retail<br>Reat | Bones<br>and<br>Pat | Total<br>Outputs | 1 |
| Boneless  | Heat         | 26,892              | 2,: 66             | -                  | -                | 24,526                  | -                   | 26,892           |   |
| Carcases  |              | 58,956              | 4,:.17             | 44,158             | -                | 1,217                   | 6,426               | 58,956           |   |
| Offals    |              | 2,032               |                    | -                  | 2,032            | -                       | -                   | 2,032            |   |
| Total     |              | 74,434              | 5,-00              | 44,158             | 2,032            | 15.480                  | 6,426               | 87,860           |   |
| B. PINAN  | CIAL (\$ mil | lion)               |                    |                    |                  |                         |                     |                  |   |
| Inputs Pr | Cim.         |                     | Outputs            | То                 |                  |                         |                     |                  |   |
| Other     |              |                     | Other              |                    |                  | Value                   |                     |                  |   |
| Sectors   | External     | Total               | Sectors            | External           | Total            | Added                   |                     |                  |   |
| 119       | 11           | 130                 | 115                | 35                 | 150              | 21                      |                     |                  |   |

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# 6.2 THE RETAIL SECTOR

#### 6.2.1 General

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The model includes two retail subsectors - butcher shops and supermarkets. The approximate allocation of beef and sheepmeats (excluding offals and sausages) between butchers and supermarkets is:-

|              | Beef               |       | Sheepmeat                 |       |  |  |
|--------------|--------------------|-------|---------------------------|-------|--|--|
|              | Tennes             | % of  | Tcnnes                    | % of  |  |  |
|              | Carcase Equivalent | Total | <u>Carcase Equivalent</u> | Total |  |  |
| Butchers     | 233,971            | 58.9  | 128 445                   | 58.3  |  |  |
| Supermarkets | 1.56,694           | 41.1  | <u>91967</u>              | 41.7  |  |  |
| Total        | 4:)5,665           | 100.0 | $220 \ 412$               | 100.0 |  |  |

# 6.2.2 Beef Retailing

Table 32 shows that retail beef sales, including beef sausages and offals, total about \$2.6 billion of which \$1.6 billion passes through butchers. This represents an average butcher shop turnover (from beef) of \$274,390 per annum or \$5,280 per week.

The estimated quantity and value of butchers' beef sales are:-

|                       | Butcher<br>Total Beef P | r Shops<br>roduct Sales | Average Beef<br>Sales per Shop ( |         |  |
|-----------------------|-------------------------|-------------------------|----------------------------------|---------|--|
|                       | (Tonnes DWT)            | (\$ millio 1)           | Annual                           | Weekly  |  |
| Retail Cuts           | 157,418                 | 1,277                   | 219,275                          | 4,217   |  |
| Sausages, Mince, etc. | 69,375                  | 316                     | 54,203                           | 1,042   |  |
| Offals                | 1,382                   | .5                      | 781                              | 15      |  |
| Bones and Fat         | 9.121                   |                         | 133                              | 3       |  |
| Total                 | 237,296                 | \$1,593                 | 3274,392                         | \$5,277 |  |

# TABLE 32 : SUMMARY OF PHYSICAL AND FINANCIAL RESULTS FOR THE BEEF RETAIL SECTOR

#### A. PHYSICAL

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|                     |         |           |         | Outrout  | a (Dwr P | -1    |         |  |
|---------------------|---------|-----------|---------|----------|----------|-------|---------|--|
|                     |         | nouts     | Retail  | Sausages | off      | als   | Bones & |  |
|                     |         | (i)#T t)  | Cuts    | Mince    |          | azo   | Pat     |  |
| Total Sector        |         |           |         |          |          |       |         |  |
| Boneless Prima      | als     | 2.)1,556  | 199,540 | -        |          | -     | -       |  |
| Carcases            |         | 2 )4, 137 | 142,036 | 84,324   |          | -     | 11,024  |  |
| Offals              |         | 2,022     | -       | -        | 2.       | 022   | -       |  |
| Sausages            |         | .10,224   | -       | 19,820   |          | -     | -       |  |
| Total               |         | 4.58,856  | 341,566 | 104,144  | 2,       | 022   | 11,024  |  |
| Butchers            |         |           |         |          |          |       |         |  |
| Boneless Prim       | als     | 58,627    | 67,941  | -        |          | -     | •       |  |
| Carcases            |         | 170,344   | 118,520 | 74,036   |          | -     | 9,199   |  |
| Offals              |         | 1,382     | -       | -        | 1.       | 382   | -       |  |
| Total               |         | 271,077   | 186,460 | 74,036   | ·`ī.     | 392   | 9,199   |  |
| Supermarkets        |         |           |         |          |          |       |         |  |
| Boneleas Prim       | als     | 1,32,929  | 131,600 | -        |          | -     | -       |  |
| Carcases            |         | 13,795    | 23,506  | 10,289   |          | -     | 1,825   |  |
| Offals              |         | 640       | -       | -        |          | 640   | -       |  |
| Sausages            |         | 20,224    | -       | 19,820   |          | -     | -       |  |
| Total               |         | 137,588   | 155,106 | 30,108   |          | 640   | 1,825   |  |
| B. FINANCIAL (\$ mi | llion}  |           |         |          |          |       |         |  |
| Inputs From         | Out     | pu:s To   |         |          |          |       |         |  |
| •                   | Of her  |           |         | Other    |          |       | Value   |  |
|                     | Sectors | Ixternal  | Total   | Sectors  | External | Total | λdded   |  |
| •<br>Dotter b = 100 |         |           | 1       |          |          |       | 107     |  |
| Butchers            | 632     | 113       | 1,405   | -        | 1,599    | 1,598 | 13.7    |  |
| Supermarkets        | 585     | 328       | 947     | -        | 1,019    | 1,009 | 62      |  |
| Total               | 1 221   | 1.131     | 2.352   | -        | 2,607    | 2,607 | 255     |  |

Total supermarket beef sales of about \$1 billion consist of:-

|                       | Supern<br><u>Total Beef Pi</u><br>(DWT Tonnes) | varket<br><u>coduct Sales</u><br>(\$ r-1.llion) |
|-----------------------|--|---|
| Retail Cuts           | 155,106  | 894   |
| Sausages, Mince, etc. | 30,108   | 112   |
| Offals                | 640  | 2   |
| Bones and Fat         | 1.825  | 0.2   |
| Total                 | 187,588  | 1,009   |

Retailing is a high value-added activity and the trend towards selling more elaborately prepared meats suggests that value added will increase in the future. Total retail sales of \$2.6 billion are the channel through which 34% of the beef industry's non-milk external income is obtained.

Whilst gross value added is high (114% cf.109% 89/90), so too are costs. Average costs and margins for butchers and supermarkets (from retailing beef) are detailed in Table 33.

|                                     |          |              | Total  |   |
|-------------------------------------|----------|--------------|--------|---|
|                                     | Butchers | Supernarkets | Sector |   |
| Total Sales (\$ million)            | 1,598    | 1,009        | 2,607  |   |
| Less: Cost of Beef Purchased (\$ m) | 632      | 538          | 1,221  |   |
| Retail Operating Costs (\$ m)       | 678      | 308          | 986    |   |
| Sub-Total (\$ m)                    | 1,310    | 895          | 2,206  |   |
| Total Gross Margin (\$ m)           | 298      | 113          | 411    |   |
| Gross Margin/kg DWT (\$)            | 1.20     | 0.30         | 0.93   |   |
| Gross Margin % of Sales             | 18.6%    | 11.2%        | 15.8%  |   |
| Fixed Costs (\$ m)                  | 94       | 50           | 144    |   |
| Total Net Margin <u>a</u> / (\$ m)  | 193      | 62           | 255    |   |
| Net Margin/kg DWT (\$)              | 0.80     | 0.33         | 0.60   |   |
| Net Margin % of Sales               | 12.1%    | 6.1%         | 9.8%   | _ |

# TABLE 33 : AVERAGE COSTS AND MARGINS FOR RETAILING BEEF

A/ Equivalent to net value addec.

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Net value added for the retail beef sector is estimated to be about \$255 million which is 9% of total value added for the beef industry.

# 6.2.3 Sheepmeat Retailing

Table 34 shows that retail sheepmeat sales, including sheepmeat sausages and offals, total about \$1.3 billion of which \$749 million is handled by butchers. This represents an average butcher turnover from sheepmeats of about \$129,000 per annum or \$2,475 per week. Summarised sheepmeat sales data for **butchers** are as follows:-

|                    | Butcher<br>Total Sheep | Shops<br>meat <u>Sales</u> | Average Sheepmeat<br>Sales per Shop (\$) |         |  |
|--------------------|------------------------|----------------------------|--|---------|--|
|                    | (DWT Tonnes)           | (\$ million)               | Armual                                   | Weekly  |  |
| Retail Cuts        | 100,082                | 591                        | 101,428                                  | 1,951   |  |
| Sausages and Mince | 37,825                 | 155                        | 26,602                                   | 512     |  |
| Offals             | 1,991                  | -1                         | 652                                      | 13      |  |
| Bones and Fat      | 1,805                  | 0.2                        | 26                                       | 0.51    |  |
| Total              | 137,696                | \$74.9                     | \$128,708                                | \$2,476 |  |

| A. PHYSICAL               |         |          |         |            |           |       | -       |  |
|---------------------------|---------|----------|---------|------------|-----------|-------|---------|--|
| ,                         |         |          |         | Output     | a (DWT t) |       |         |  |
|                           |         | ) nputs  | Retail  | Sausages 4 | Offal     | a E   | kones & |  |
| •                         |         | (147 t)  | Cuts    | Mince      |           |       | Pat     |  |
| Total Sector              |         | _        |         |            |           |       |         |  |
| Boneless Heat             |         | 1.2,722  | 12,595  | -          | -         |       | -       |  |
| Carcases                  |         | 217,690  | 158,883 | 57,040     | ~         |       | 3,115   |  |
| Offals                    |         | 2,633    | -       | -          | 2,58      | 1     | -       |  |
| Sausages                  |         | :5,604   | -       | 15,448     | -         |       | -       |  |
| Total                     |         | 2:8,650  | 171,478 | 72,488     | 2,58      | 1     | 3,115   |  |
| Butchers                  |         |          |         |            |           |       |         |  |
| Boneless Meat             |         | 8,096    | 8,015   | -          | -         |       |         |  |
| Carcases                  |         | 1:0,349  | 92,067  | 37,825     | -         |       | 1,805   |  |
| Offals                    |         | 2,032    | -       | -          | 1,99      | 1     | -       |  |
| Total                     |         | 1:0,477  | 100,082 | 37,825     | 1,99      | 1     | 1,805   |  |
| Supermarkets              |         |          |         |            |           |       |         |  |
| Boneless Meat             |         | 4,626    | 4,580   | -          | -         |       | -       |  |
| Carcases                  |         | 17,341   | 66,816  | 19,215     | -         |       | 1,310   |  |
| Offals                    |         | 601      | -       | -          | 58        | 39    | -       |  |
| Sausages                  |         | 15,604   | -       | 15,448     | -         |       | -       |  |
| Total                     |         | 1(8,173  | 71,396  | 34,663     | 58        | 39    | 1,310   |  |
| B. FINANCIAL (\$ million) |         |          |         |            |           |       |         |  |
| Inputs Prom               | Out     | outs To  |         |            |           |       |         |  |
|                           | Other   |          |         | Other      |           |       | Value   |  |
|                           | Sectora | External | Total   | Sectors    | External  | Total | Added   |  |
| Butchera                  | 219     | 405      | 624     | -          | 749       | 749   | 126     |  |
| Supermarkets              | 2 17    | 270      | 487     | -          | 540       | 540   | 52      |  |
| Total                     | 415     | 675      | 1,111   |            | 1,289     | 1,289 | 178     |  |

# TABLE 34 : SUMMARY OF PHYSICAL AND FINANCIAL RESULTS FOR THE SHEEP RETAIL SECTOR

Total sheepmeat sales from the **supermarket** subsector of about \$540 million consist of:-

|                    | Superm             | narket            |
|--------------------|--------------------|-------------------|
|                    | <u>Total Sheep</u> | <u>meat Sales</u> |
|                    | (Tonnes DWT)       | (\$ million)      |
| Retail Cuta        | 71,396             | 417.5             |
| Sausages and Mince | 34,663             | 120.8             |
| Offals             | 589                | 1.2               |
| Bones and Fai      | 1,310              | .0.1              |
| Total              | 107,959            | 539.6             |

The gross value added through sheepmeat retailing represents 195% of the value of sheepmeat purchased by the total sector. Total retail sales of \$1.3 billion are the channel through which 47% of the sheep industry's non-wool external income is obtained.

Average costs and margins for butchers and supermarkets which retail sheepmeat are estimated in Table 35.

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| ·                                   | Butchers | Supermarkets | Total Sector |
|-------------------------------------|----------|--------------|--------------|
|                                     |          |              |              |
| Total Sales (\$ million)            | 749      | 5∉0          | 1,289        |
| Less: Cost of Meat Purchased (\$ m) | 219      | 217          | 436          |
| Retail Operating Costs (3 m)        | 313      | 2(4          | 517          |
| Sub-total (\$ m)                    | 532      | 421          | 953          |
| Total Gross Margin (\$ m)           | 218      | 119          | 337          |
| Gross Margin/kg DWT (\$)            | 1.67     | 1.09         | 1.41         |
| Gross Margin % of Sales             | 29%      | 22  k        | 26%          |
| Fixed Costs (\$ m)                  | 92       | €6           | 158          |
| Total Net Margin (\$ m) <u>a</u> /  | 126      | 52           | 178          |
| Net Margin/kg DWT(\$)               | 0.96     | 0.48         | 0.75         |
| Net Margin % of Sales               | 17%      | 10 %         | 14%          |

#### TABLE 35 : AVERAGE COSTS AND MARGINS FOR RETAILING SHEEPMEAT

a/ Equivalent to net value added.

Net value added for the retain sheepmeat sector is estimated to be \$178 million.

#### 6.3 THE EXPORT SECTOR

#### 6.3.1 General

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The overall importance of the export sector in the Australian Meat and Livestock Industry is demonstrated below:-

|   | Cat le<br>Indu: try | Sheep<br><u>Industry</u> | <u>Total</u> |
|---|---------------------|--------------------------|--------------|
| Exports (\$ m)  | 3,26-9              | 761                      | 4,030        |
| Domestic Meat Sales (\$ m)                            | 2,606               | 1,289                    | 3,895        |
| Total External Sales excluding Milk and Wool (\$ m)   | 7,658               | -2,751                   | 10,409       |
| Exports % of Total Sales excluding Wool and Milk      | 43%                 | 28%                      | 39%          |
| Exports % of Total Meat Sales (excluding by-products) | 56%                 | 37%                      | 51%          |

These figures indicate that, excluding milk and wool, the wattle industry is more dependent on exports than the sheep industry. The total industry (cattle and sheep) obtains 74% of its total income, and 81% of its export income, from beef.

The export sector as defined excludes the export of hides, skins, dairy products and other by-products. Where these items are exported, they are assumed to move directly from the sectors in which they are produced without passing through an exporting sector.

THE VALUE CHAIN FOR MEAT AND LIVESTOCK PRODUCTS MAIN REPORT

In a change to how export costs are measured, the export meat sector incorporates all activities in the movement of meat from abattoir, to the point where the products are loaded onto ships for overseas destinations. At this point ownership is assumed to pass to foreign entities (at the FOB<sup>1</sup> value) and the goods are considered to have left the sector. For livestock exports, costs are measured to the point where livestock arrive at overseas destinations (at the CIF<sup>2</sup> value).

It is recognised that this is a simplification of the true picture. Meat or livestock can change hands several times between the abattoir or farm, and the point of overseas delivery. In some cases the abattoir sector retains ownership up to the point of delivery. In other cases Australia-owned entities add further value by processing and/or distribution in overseas markets.

Two subsectors form the export sector - one involves meat and the other live animal exports. Beef exports are the most important and generate 96% of the gross cattle export income. The equivalent figures for sheepmeats, and the total Meat and Livestock Industry, are 62% and 89%, respectively.

#### External Inputs

Table 36 shows the breakdown of external costs for the cattle and sheep export sector.

| TABLE 36 : EXTERNA | L INPUTS PURCHA | ASED BY THE | EXPORT | SECTOR |
|--------------------|-----------------|-------------|--------|--------|
|                    | (\$ million     | )           |        |        |

|                                   | Meat   | Export | Live I | Export |
|-----------------------------------|--------|--------|--------|--------|
| Cost Item                         | Cattle | Sheep  | Cattle | Sheep  |
|                                   |        |        |        |        |
| Freight and Handling              | 12     | 15     | 13     | 10     |
| Insurance                         | -      | -      | 1      | 9      |
| Shipping Costs - Live             | -      | -      | 26     | 111    |
| Interest                          | 43     | 8      | 2      | 6      |
| Levies                            | 26     | 8      | 0.3 ·  | -      |
| Quarantine                        | -      | -      | 4      | 3      |
| Commission                        | 41     | 9      | -      | -      |
| Contract Shearing                 | -      | -      | -      | 4      |
| Fodder/Agistment/Feedlotting Cost | -      | -      | 4      | 31     |
| Total                             | 122    | 40     | 50     | 174    |

'FOB = Price + the cost of freight on board (FOB) the ship

 $^{2}$  CIF = Price + insurance + freight (insurance and freight incurred in shipping meat and livestock overseas).

# 6.3.2 Live Cattle and Beef

The export focus of the Australian beef industry is highlighted by the fact that beef export income is 43% of total industry income (excluding nulk) and 56% of total meat income (excluding by-products).

# Live Cattle

This subsector handles about 193,000 cattle per annum (2.3% of turnoff). The main destinations are in Asia. Average CIF value per head is estimated to be \$682, yielding a total export income of about \$131 million. Total costs are \$123 million of which 60 percent represents the cost of livestock purchases Shipping makes up most of the external costs. Net value added post farm gate is estimated to be about \$8 million per annum or \$43 per animal. This compares with an average value added of \$58 per head for beef passing through the domestic and export beef marketing channels.

#### Beef Exports

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Table 37 shows that total exports of beef products (at FOB values in 1991-1994) averaged \$2.84 billion and consisted of:-

| Product          | Quantity<br>('000 t DWT) | % of<br><u>Quantity</u> | Estimated<br><u>Value (\$ m)</u> | % of<br><u>Value</u> |
|------------------|--------------------------|-------------------------|----------------------------------|----------------------|
| Boneless Primals | 466                      | 39.0                    | 1,452                            | 51.2                 |
| Boneless Other   | 457                      | 38.2                    | 318                              | 28.8                 |
| Beef Carcases    | 183                      | 15.3                    | -135                             | 15.3                 |
| Beef Offals      | 58                       | _4.8                    | 33                               | 4.7                  |
| Total            | 870                      | 100.0                   | 2,337                            | 100.0                |

### TABLE 37 : SUMMARY OF PHYSICAL AND FINANCIAL RESULTS FOR THE CATTLE EXPORT SECTOR

|                           |         |                       | a                   | tputs ('000       | ) E DWT) |          |                          |  |
|---------------------------|---------|-----------------------|---------------------|-------------------|----------|----------|--------------------------|--|
|                           | (       | (nputs<br>1000 t EWT) | Boneless<br>Primals | Boneless<br>Other | Carcases | Offals   | Wive Cattle<br>('000 hd) |  |
| Boneless Primals          |         | 466                   | 465                 |                   | -        | -        | -                        |  |
| Boneless Other            |         | 457                   | -                   | 457               | -        | -        | -                        |  |
| Carcases                  |         | 183                   |                     | -                 | 183      | -        | -                        |  |
| Offals                    |         | 58                    |                     | -                 | -        | 58       | -                        |  |
| Live Cattle ('000 hd      | )       | 192.9                 | -                   |                   |          | <b>_</b> | 192.9                    |  |
| 3. FINANCIAL (\$ million) |         |                       |                     |                   |          |          |                          |  |
| Inputs From               | Out     | outs To               |                     |                   |          |          |                          |  |
|                           | Other   |                       | _                   | Other             |          |          | Value                    |  |
|                           | Sectors | External              | Total               | Sectors           | External | lotal    | Added                    |  |
| Live Cattle               | 73      | 5.                    | 123                 | -                 | 131      | 131      | 8                        |  |
| Beef                      | 2,837   | 12:                   | 2,960               | -                 | 3,138    | 3,138    | L79                      |  |
| 70t a 1                   | 2 010   | 170                   | 2 082               |                   | 2 269    | 1 769    | 187                      |  |

THE VALUE CHAIN FOR MEAT AND LIVESTOCK PRODUCTS MAIN REPORT

The cost of exporting beef on a FOB basis averaged 14 cents/kg and totalled \$122 million. Total value added from beef exports is estimated to be about \$179 million which represents 6% of total export sales or 21 cents/kg of shipped weight.

#### 6.3.3 Live Sheep and Sheepmeats

#### Live Sheep

The live sheep subsector handles about 4.8 million sheep annually (13% of turnoff) of which most are shorn Merino wethers for the Middle East. Average CIF values are estimated to be \$57 per head yielding a total income of about \$293 million (including \$15 million in wool). Total costs are about \$254 million of which 31% represents livestock purchases and 69% external costs most notably shipping and feeding costs. Net value added post farm gate is estimated to be around \$38 million, equivalent to about \$7.92 per sheep exported.

#### Sheepmeat Exports

Table 38 shows that exports of sheepmeats between 1991 and 1994 averaged \$469 million per year and consisted of:-

| Product             | Quantity     | % of            | Estimated           | % of         |
|---------------------|--------------|-----------------|---------------------|--------------|
|                     | ('000 t DWT) | <u>Quantity</u> | <u>Value (\$ m)</u> | <u>Value</u> |
| Boneless Sheep:neat | 159          | 51.3            | 185                 | 39.4         |
| Sheepmeat Carcases  | 141          | 45.5            | 268                 | 57.2         |
| Sheep Offals        | <u>10</u>    | <u>3.2</u>      | <u>16</u>           | <u>3.4</u>   |
| Total               | 310          | 100             | 469                 | 100          |

The cost of exporting sheepmeats on a FOB basis averaged 13 cents/kg DWT to total \$40 million. Total value added is estimated to be around \$23 million which is 5% of total export sales or 7 5 cents/kg DWT.

# TABLE 38 : SUMMARY OF PHYSICAL AND FINANCIAL RESULTS FOR SHEEP EXPORT SECTOR

| λ. | PHYSICAL |
|----|----------|
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|                       |                        | Out                   | puts ('000 t D | ert)   |                         |
|-----------------------|------------------------|-----------------------|----------------|--------|-------------------------|
|                       | Imputa<br>('000 t DWT) | Boneless<br>Sheepmeat | Carcases       | Offala | Live Sheep<br>('000 hd) |
|                       |                        |                       |                |        |                         |
| Boneless Sheepmeat    | 159                    | 159                   | -              | •      | -                       |
| Carcases              | 141                    | -                     | 141            |        | -                       |
| Offals                | 10                     | -                     | -              | 10     | -                       |
| Live Sheep (No. Head) | 4,835                  | -                     | -              | -      | 4,835                   |

B. FINANCIAL (\$ million)

|                 |         | Inputs From |       |         | Autputs To |       |       |
|-----------------|---------|-------------|-------|---------|------------|-------|-------|
|                 | Other   |             |       | Other   |            | _     | Value |
|                 | Sectors | External    | Total | Sectors | Externai   | Total | Added |
| Live Sheep      | 8.)     | 174         | 254   | -       | 293        | 293   | 38    |
| Mutton and Lamb | 405     | 40          | 445   | -       | 469        | 469   | 23    |
| Total           | 485     | 214         | 700   | -       | 761        | 761   | 62    |