



**Dairy Farm Monitor Project**  
Western Australia  
annual report 2014–15

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The South West Development Commission is pleased to support Western Dairy's Dairy Farm Monitor Report as part of its wider efforts to support business and industry in the South West. The project plays a critical role in identifying areas for farm performance improvement, as well as providing vital benchmark information for Dairy Australia's DairyBase tool. It is linked to our aims of growing the agricultural sector in order to grow jobs and investment in the region.

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To find out the latest information on the project visit the project website at

<http://www.dairyaustralia.com.au/dairyfarmmonitor>

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# How to read this report

This section explains the calculations used and the data presented throughout this report. The purpose of the different sections of the report is also discussed.

This report is presented in the following sections:

- › Summary
- › Farm monitor method
- › Western Australia overview
- › Statewide performance
- › Business confidence survey
- › Greenhouse gas emissions report
- › Appendices

There were 29 participant farms involved in the project in 2014/15 representing the distribution of farm and herd sizes and geographical locations within the Western Australia (WA) dairy region. These were the same 30 farmers who participated in 2013/14, with one farmer opting to combine two of their farms this year.

The report presents visual descriptions of the data for the 2014/15 year. Data are presented for individual farms, as statewide averages and for the statewide top 25% of farms ranked by return on assets. The presented averages should not be considered averages for all WA dairy farms due to the small sample size and these farms not being randomly selected.

The top 25% of farms are presented as lighter coloured striped bars in the Western Australian performance overview figures. Return on assets is the determinant used to identify the top 25% of participants as it provides an assessment of the performance of the whole farm irrespective of differences in location and production system.

The Q1 - Q3 data range for key indicators are also presented to provide an indication of the variation in the data. The Q1 value is the quartile 1 value, that is, the value of which one quarter (25%) of data in that range is less than the average. The Q3 value is the quartile 3 value that is the value of which one quarter (75%) of data in that range is greater than the average. Therefore the middle 50% of data resides between the Q1-Q3 data range.

The appendices include detailed data tables, a list of abbreviations and a glossary of terms.

Milk production data are presented in kilograms of milk solids and where possible production data are also reported in litres. There are also occasional reference to measures on a per hectare or per cow basis.

Where financial data are reported in cents/litre, this is derived from the total litres produced per farm and is not corrected for varying levels of milk components. The exception is for milk income, where the actual cents per litre received by each farm is reported.

The appendix tables contain the majority of financial information on a per kilogram of milk solids basis.

Percentage differences are calculated as  $[(\text{new value} - \text{original value}) / \text{original value}] \times 100$ . For example 'costs went from \$80/ha to \$120/ha, a 50% increase';  $[(120-80)/80] \times 100 = 50\%$ , unless otherwise stated.

Any reference to 'last year' refers to the 2013/14 Dairy Farm Monitor Project Western Australia report. Price and cost comparisons between years are nominal unless otherwise stated.

Please note that text explaining terms will be repeated within the different chapters.

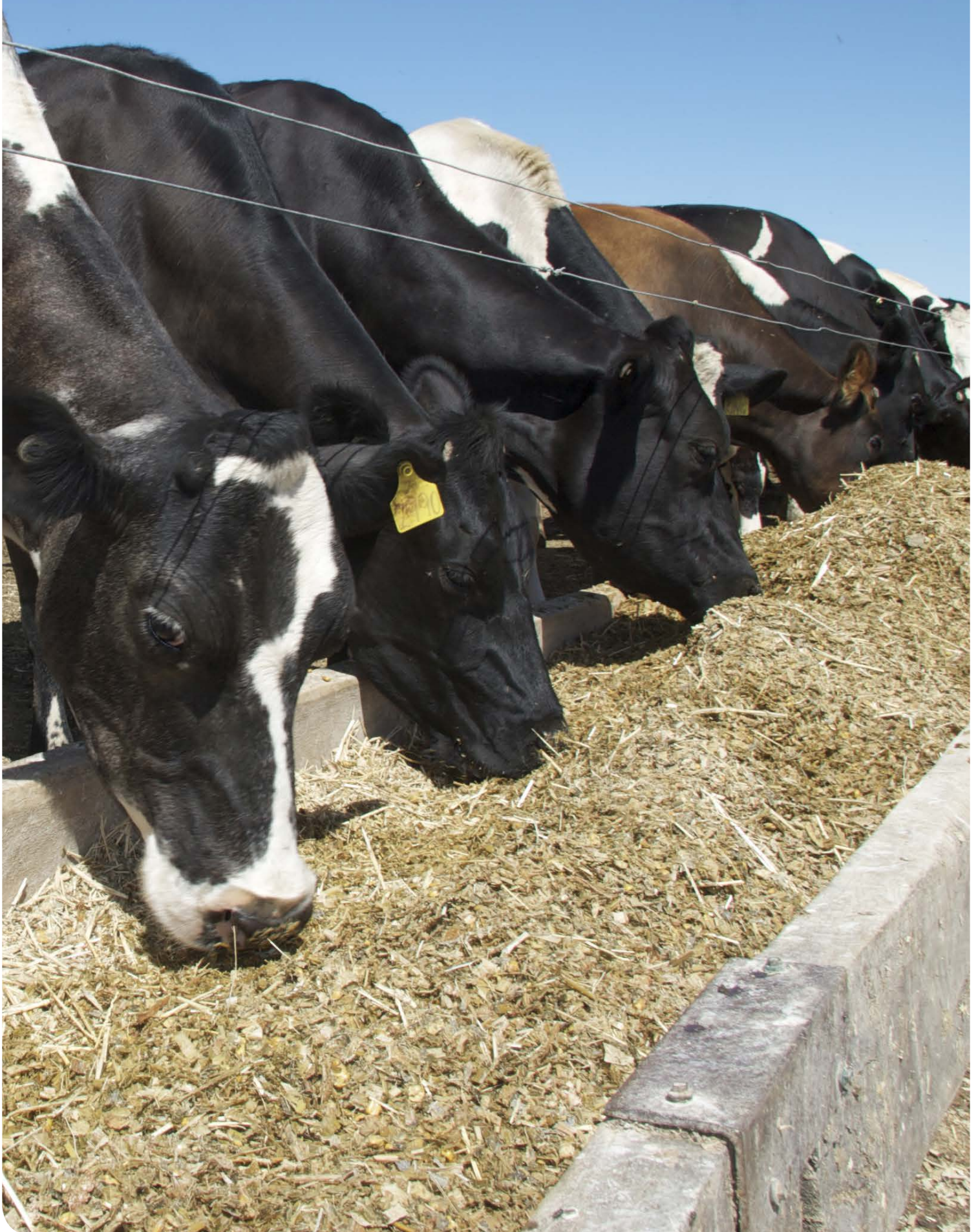
## What's new in 2014/15?

The Dairy Farm Monitor Report for 2014/15 pasture consumption calculations have been revised to now align with the DEDJTR Dairy Pasture Consumption Calculator available online at [dairypastureconsumptioncalculator.com.au](http://dairypastureconsumptioncalculator.com.au).

Keep an eye on the project website for further reports and updates on the project at [dairyaustralia.com.au/dairyfarmmonitor](http://dairyaustralia.com.au/dairyfarmmonitor).



## Summary





# Summary

In 2014/15 the data from 29 farms in WA resulted in average whole farm earnings before interest and tax (EBIT) of \$641,083, a 53% increase compared with the previous year. Return on assets was 6.7% compared with last year's 4.6%. Average milk solids sold per cow increased from 505 kg in 2013/14 to 535 kg this year.

This is the second year of the Dairy Farm Monitor Project (DFMP) in Western Australia with support and funding from Dairy Australia. The project aims to provide the WA dairy industry with valuable farm level data relating to profitability and production.

The same 29 Western Australian dairy farmers who initially volunteered to be involved in the DFMP in 2013/14 participated again in 2014/15, with one farmer opting to combine two of their farms this year.

The average milk price of \$7.07 /kg MS (51.1 c/l) was a 7.5% increase from last year's price of \$6.62 /kg MS (48.1 c/l). The higher milk price reflected the strong competition for milk supply resulting in higher milk price contracts plus summer growth milk premiums offered by some processors. Higher milk price contributed to all participant farms achieving a higher positive return on assets, averaging 6.7% compared to 4.6% in 2013/14.

All farms generated a positive earnings before interest and tax (EBIT), averaging \$641,083 per farm or \$2.17/kg MS (15.7 c/l), a 36% increase from 2013/14.

Despite higher milk prices, participants generally managed to maintain costs of production with no change in average variable costs compared to 2013/14 while achieving a 4% decrease in average overhead costs.

The 2014/15 season was a considerably drier year with farms receiving on average 14% less rainfall compared to the 2013/14 season. Farms north of Busselton had a significantly drier year compared to farms south of Busselton. A good spring was followed by a mild summer.

Concentrates contributed 32% of whole farm metabolisable energy (ME) fed, compared to 33% last year, at a similar average cost of \$421/t compared to \$418/t last year.

Improved labour efficiency, higher milk production per cow and per hectare along with lower costs of production are key indicators that distinguished the top 25% participants in 2014/15.

The top 25% farms achieved an average EBIT of \$3.06/kg MS (22 c/l) and average return on assets of 11.2% compared to state average of \$2.17/kg MS (15.7 c/l) and 6.7%, respectively.

Expectations for the coming season are positive with more than half (52%) of respondents optimistic that farm business returns would improve in 2015/16 while a further 31% expected no change to returns. As a result, 57% of farmers plan to increase milk production with 36% planning to maintain production levels while only two farms expect to decrease production.

This reflects the growing confidence and buoyancy within the WA dairy industry in response to growing demand and generally higher milk prices paid in 2014/15.

Milk price, labour and feed price are the main issues of concern over the next year. Retirement, succession planning, labour and milk price were the major long term issues facing the Western Australian participant farmers.

## Farm monitor method



# Farm monitor method

This chapter explains the methodology used in the Dairy Farm Monitor Project and defines the key terms used.

The method employed to generate the profitability and productivity data was adapted from that described in *The Farming Game* (Malcolm *et al.* 2005) and is consistent with previous Dairy Farm Monitor Project reports. Readers should be aware that not all benchmarking programs use the same methodology or terminology for farm financial reporting. The allocation of items such as lease costs, overhead costs or imputed labour costs against the farm enterprises varies between

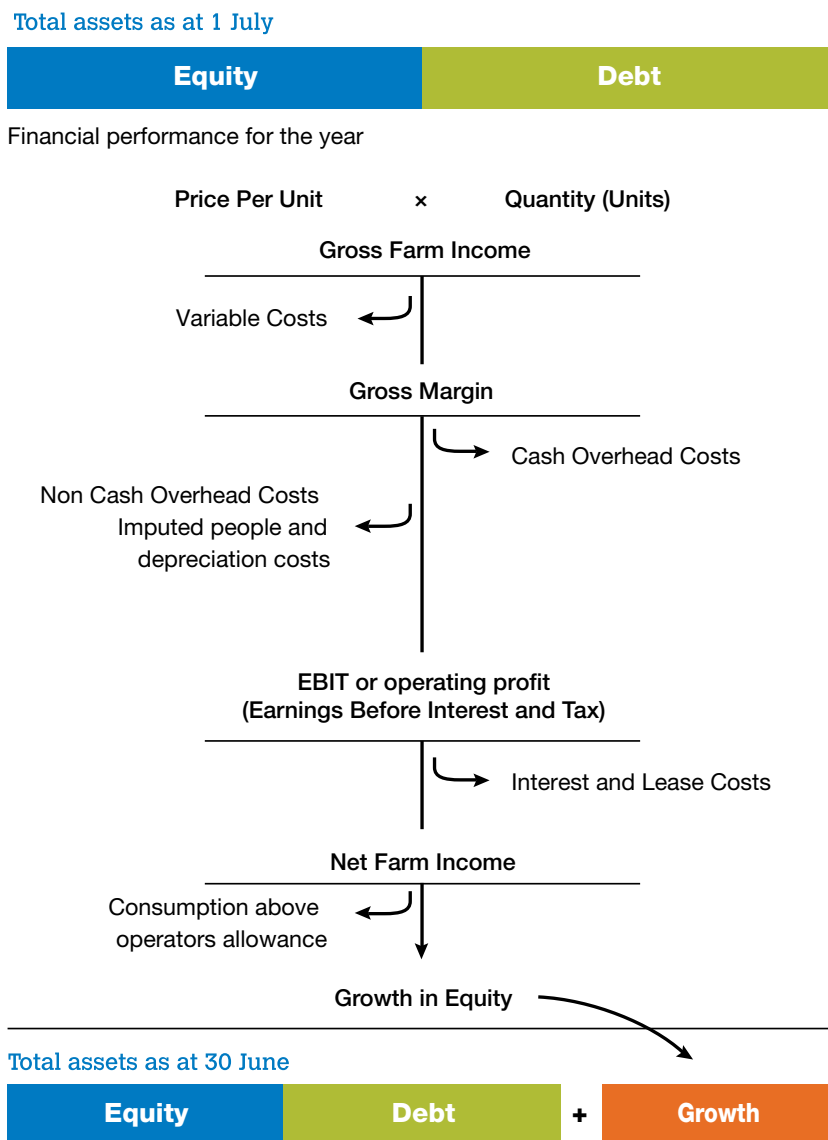
financial benchmarking programs. Standard dollar values for items such as stock and feed on hand and imputed labour rates may also vary. For this reason, the results from different benchmarking programs should be compared with caution.

Figure 1 demonstrates how the different farm business economic terms fit together and are calculated. This has been adapted from an initial diagram developed by Bill Malcolm. The diagram shows

the different profitability measures as costs are deducted from total income. Growth is achieved by investing in assets which generate income. These assets can be owned with equity (one's own capital) or debt (borrowed capital). The amount of growth is dependent on the maximisation of income and minimisation of costs, or cost efficiency relative to income generation.

Figure 2 shows this methodology using the average for all participants in the project. Production and economic data is both shown to indicate how the terms are calculated and how they in turn fit together.

**Figure 1** Dairy farm monitor project method



## Gross farm income

The farming business generates a total income which is the sum of milk cash income (net), livestock trading profit, feed inventory change or other sources such as milk share dividends. The main source of income is from milk, which is calculated by multiplying price received per unit by the number of units. For example, dollars per kilogram milk solids multiplied by kilograms of milk solids produced. Subtracting certain costs from total income gives different profitability measures.

## Variable costs

Variable costs are the costs specific to an enterprise, such as herd, shed and feed costs. These costs vary in relation to the size of the enterprise. Subtracting variable costs for the dairy enterprise only from gross farm income, gives the gross margin. Gross margins are a common method for comparing between similar enterprises and are commonly used in broad acre cropping and livestock enterprises. Gross margins are not generally referred to in economic analysis of dairy farming businesses due to the specific infrastructure investment required to operate a dairy farm making it less desirable to switch enterprise.



## Overhead costs

Overhead costs are costs not directly related to an enterprise as they are expenses incurred through the general operating of the business. The Dairy Farm Monitor Project separates overheads into cash and non cash overheads, to distinguish between different cash flows within the business. Cash overheads include rates, insurance, and repairs and maintenance. Non cash overheads include costs that are not actual cash receipts or expenditure; for example the amount of depreciation on a piece of equipment. Imputed operators' allowance for labour and management is also a non-cash overhead that must be costed and deducted from income if a realistic estimate of costs, profit and the return on the capital of the business is to be obtained.

## Earnings before interest and tax

Earnings before interest and tax (EBIT) are calculated by subtracting variable and overhead costs from gross farm income. Earnings before interest and tax is sometimes referred to as operating profit and is the return from all the capital used in the business.

## Net farm income

Net farm income is EBIT minus interest and lease costs and is the reward to the farmer's own capital. Interest and lease costs are viewed as financing expenses, either for borrowed money or leased land that is being utilised.

Net farm income is then used to pay tax and what is remaining is net profit or surplus and therefore growth, which can be invested into the business to expand the equity base, either by direct reinvestment or the payment of debt

## Return on assets and return on equity

Two commonly used economic indicators of whole farm performance are return on assets and return on equity. They measure the return to their respective capital base.

Return on assets indicates the overall earning of the total farm assets, irrespective of capital structure of the business. It is EBIT or operating profit expressed as a percentage of the total assets under management in the farm business, including the value of leased assets. Earnings before interest and tax expressed as a return on total assets is the return from farming. There is also a further return to the

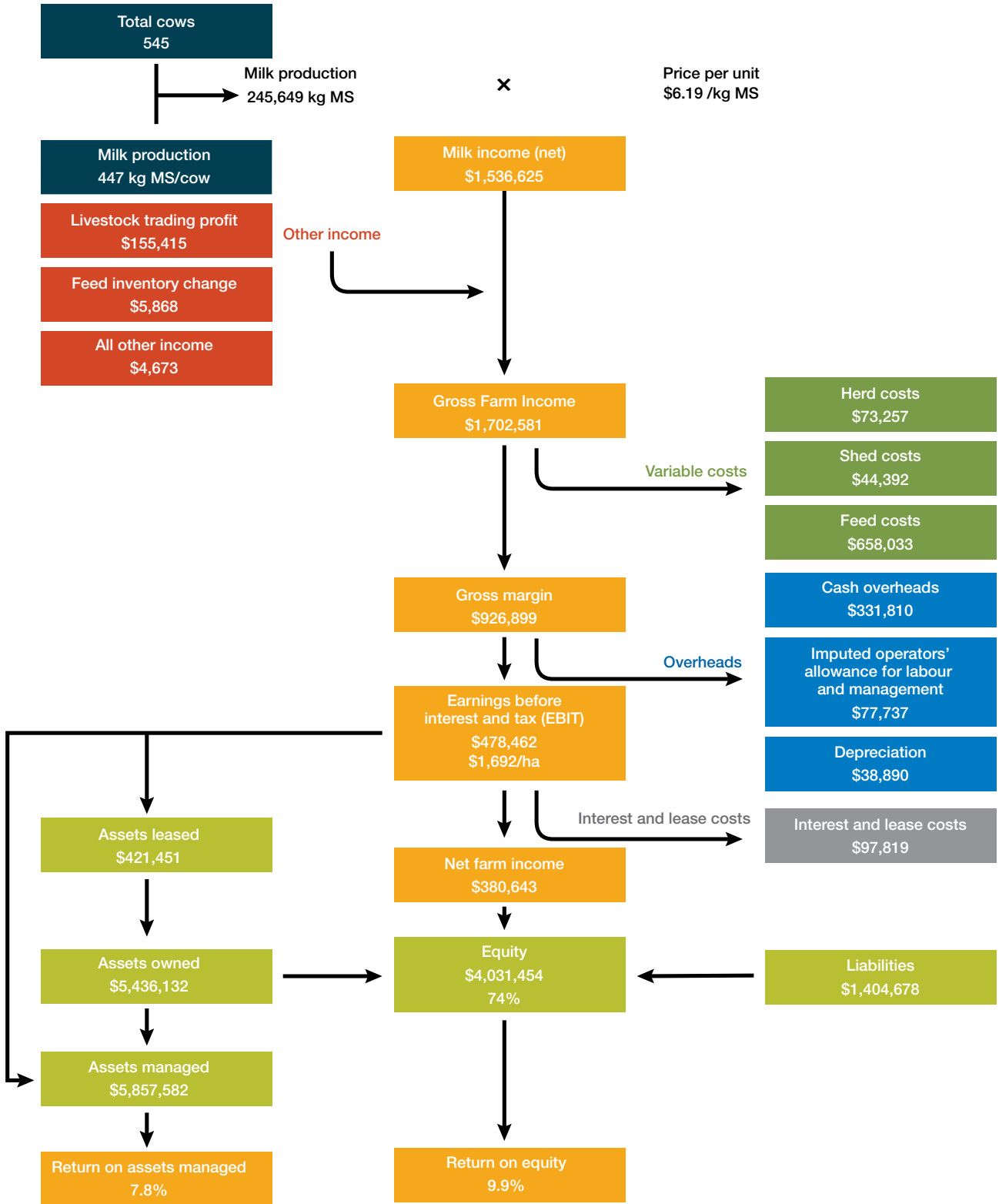
asset from any increase in the value of the assets over the year, such as land value. If land value goes up 5% over the year, this is added to the return from farming to give total return to the investment. This return to total assets can be compared with the performance of alternative investments with similar risk in the economy. Return on assets is sometimes referred to as return on capital. The return on equity including capital appreciation is reported in Appendix Table 1 for each region.

In Figure 1, total assets are visually represented by debt and equity. The debt: equity ratio or equity percent of total capital varies depending on the detail of individual farm business and the situation of the owners, including their attitude towards risk.

Return on equity measures the owner's rate of return on their own capital investment in the business. It is net farm income expressed as a percentage of total equity (one's own capital). The Dairy Farm Monitor Project reports return on equity with and without capital appreciation. This is to distinguish between productivity gains (return on equity without capital appreciation) and capital gains (return on equity with capital appreciation).

**Figure 2** Dairy farm monitor project method profit map – state average data<sup>1</sup>

All farms 29



<sup>1</sup> Profit map adapted from Queensland Dairy Accounting Scheme - 2010 with permission from Ray Murphy, Department of Agriculture, Fisheries and Forestry, Queensland



## Western Australian overview



# Western Australian overview

Western Australia represents approximately 3.7%, or 364 million litres, of the Australian dairy industry milk production in 2014/15. Milk production in Western Australia increased approximately 7% in 2014/15, reflecting improved conditions, compared to the national increase of 3.8%.

Following a number of years of industry contraction in Western Australia, the number of milking herds remained stable at 157 reflecting cautious optimism within the industry.

The 7% increase in milk production in 2014/15 came after annual decreases in milk production since 2000. This increase was in response to positive price signals and long term demand signals from processors.

Western Australian milk continues to be recognised for its high quality, with six WA farms being in the top 100 nationally, based on bulk milk cell count.

The WA dairy industry is located in the higher rainfall (> 900 mm) coastal region of the South West and South Coast of the state.

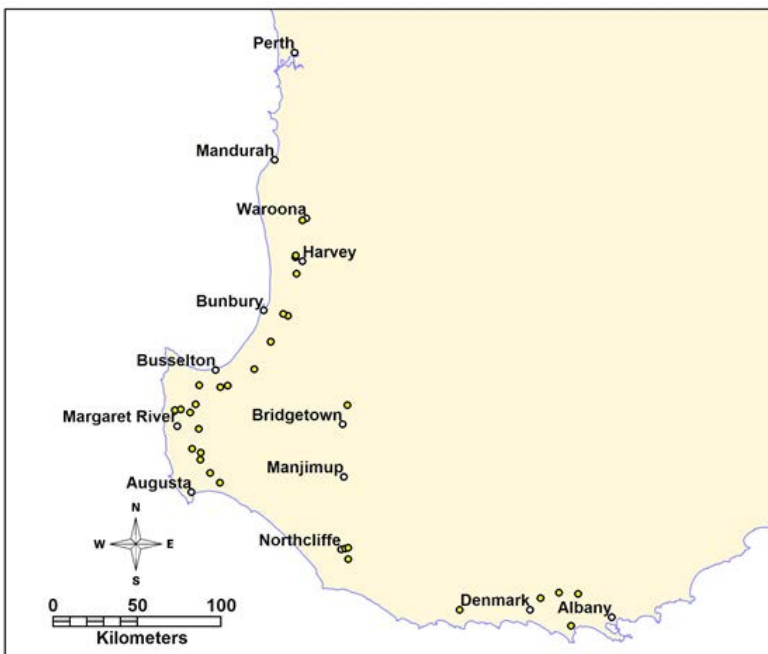
Land values in the South West are generally higher than the South Coast reflecting greater land use competition from industries such as viticulture and for lifestyle blocks.

The WA dairy region has a Mediterranean climate with associated winter rainfall and hot dry summers. Western Australia has a ryegrass pasture-based production system based on rain-fed annuals on dryland farms and irrigated perennial pastures on farms with irrigation. These pasture based systems are supplemented with a range of feeds including concentrates, silage and hay at levels ranging from low input to high input farms.

Fourteen of the 29 farms participating have some irrigation.

The approximate location of the 29 participating farms is shown in Figure 3.

**Figure 3** Distribution of participant farms in 2014/15 across Western Australia





# 2014/15 Seasonal conditions

Drier seasonal conditions prevailed throughout 2014/15, with below average rainfall across all WA dairy regions.

The rainfall in 2014/15 was 14% lower than the above average wet year in 2013/14 (Figure 4). Farms received an average of 882 mm rainfall, 10% less than the long term average, compared to 1,030 mm in 2013/14. However some farms received 25% less than their average long-term average annual rainfall.

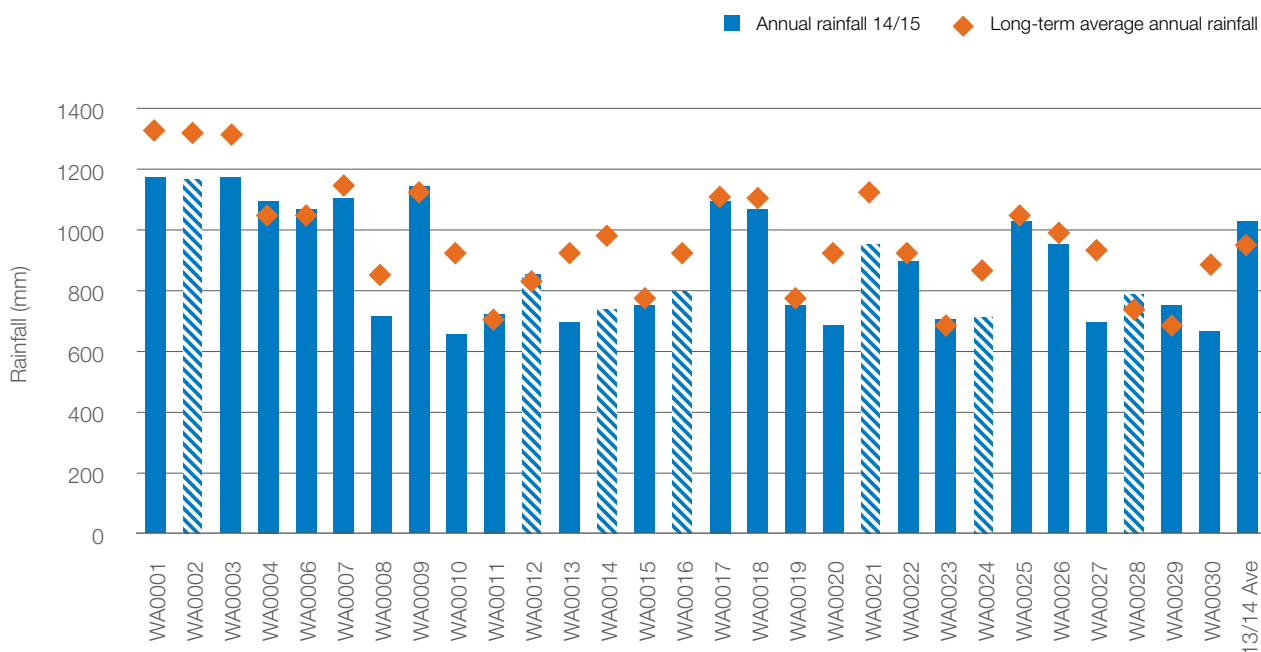
Whilst Figure 4 shows the individual farm rainfall on an annual basis not all participant farms received below long term annual rainfall. For these farms the month in which the rain fell is equally important. Figure 5 shows the average monthly rainfall pattern compared to the long term annual average.

The season started with a relatively early break in April 2014, providing a good start to the growing season. For farms south of Busselton this was followed up with reasonable rains providing good quality pasture heading back into winter. However, farms north of Busselton experienced a relatively dry winter.

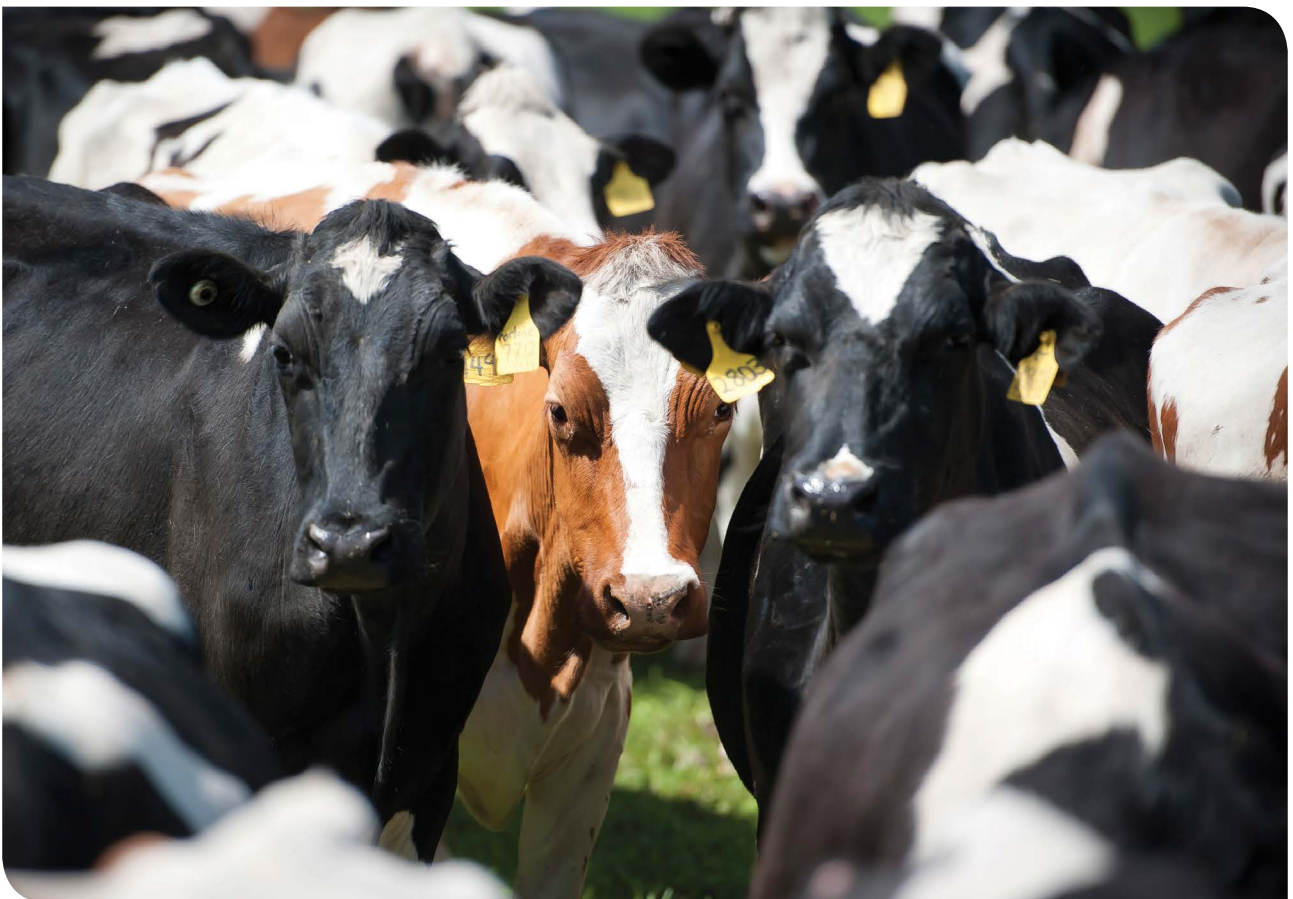
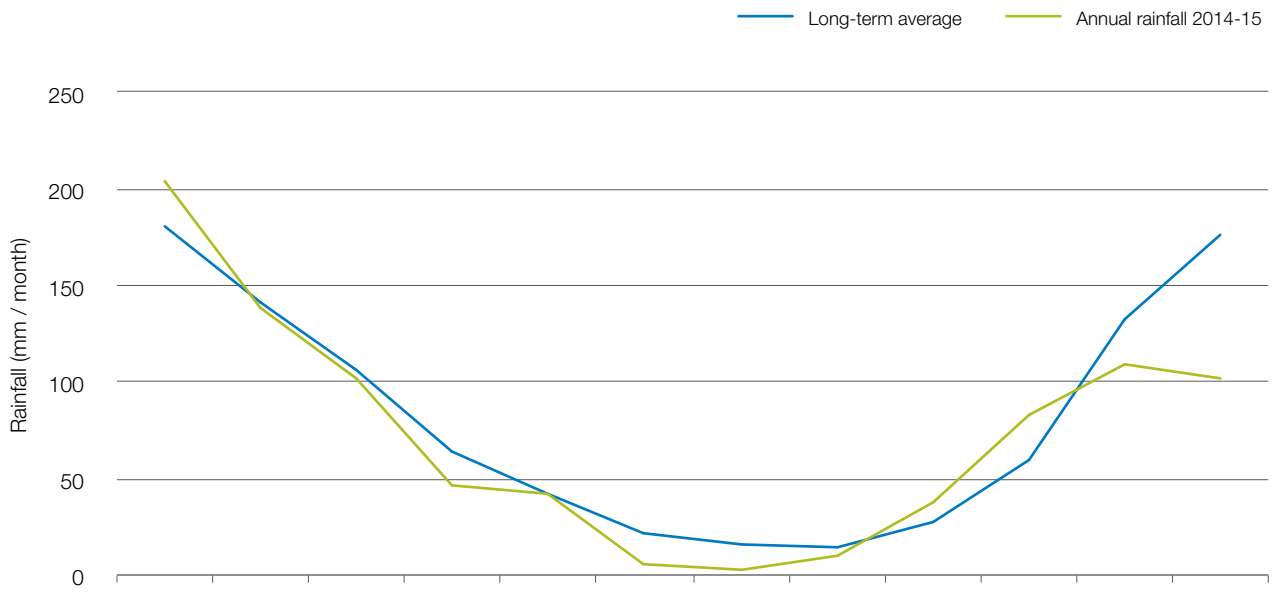
In general spring conditions were good with good silage and hay yields.

Pasture production was reduced with lower than average rain falling in October and November across most farms. Overall summer conditions were mild.

**Figure 4** 2014/15 Annual rainfall and long term average rainfall



**Figure 5** 2014/15 monthly rainfall





Statewide performance



# Statewide performance

The 29 participant farms represented 18% of the Western Australia dairy industry in terms of number of farms. However, there is a large range of farm and herd size and dairy systems across the participant farmers, so care is required when interpreting averages.

While the Western Australia dairy industry increased milk production by 7.1% in 2014/15, the 29 DFMP farms increased milk production by 11.6% compared to their 2013/14 production. This large increase in milk production was influenced by a 6.8% increase in milk price to \$7.07 /kg MS (51.1 c/l) from \$6.62 /kg MS (48.1 c/l) last year as processors continued to compete for supply and a significant summer milk growth incentive offered by one processor.

An increase in average herd size of 4% plus an increase in milk production per cow of 6% contributed to the increased production of participating farms.

Labour efficiency per kg MS increased by 6.5%.

Table 1 presents a summary of the average physical parameters of the 29 participant farms.

Further details can be found in the Appendix Table 2 for individual farms.

While the average herd size (number of cows milked for at least three months) was 543, there was a wide range in herd size from 180 to 1,359 cows with five farms milking more than 1,000 cows.

Figure 6 is a visual representation of the average farm financial performance of participant farms expressed as \$/kg milk solids. The blue colours represent income per kilogram of milk solids added vertically to provide gross farm income. From gross farm income, the green variable costs can be subtracted to give the grey gross margin values. From the gross margin the red/orange overhead costs can be subtracted to provide the yellow earnings before interest and tax. The legend for Figure 5 and the values for categories can be found in Table 2.

## Gross farm income

Gross farm income includes all farm income from milk sales, change in inventories of stock or feed and cash income from livestock trading.

While Figure 6 shows how much milk income dominates gross income, other sources are still important to the farm business. Across the participating farms, income from sources other than milk accounted for 14% of gross farm income, but ranged from 7% to 27%.

The majority of the income from other sources is derived from higher livestock trading profit on many WA dairy farms compared to other dairy states. This is a combination of many farms choosing to rear extra heifers to replace an aging herd structure plus rearing steer calves to sell into their beef enterprise.

**Table 1** Farm physical data – State overview

Farm physical parameters	Average
Number of farms in sample	29
Herd size (no. cows milked for at least 3 months)	543
Annual rainfall 13/14 (mm)	882
Water used (irrigation + rainfall) (mm/ha)	625
Total usable area (hectares)	581
Stocking rate (milking cows per usable hectare)	0.9
Milk solids sold (kg MS/cow)	535
Milk solids sold (kg MS/ha)	486
Milk price received (\$/kg MS)	\$7.07
Milk price received (c/litre)	51.1
Labour efficiency (milking cows/FTE)	95
Labour efficiency (kg MS/FTE)	50,150



## Variable costs

Variable costs are costs directly associated with production. Examples include animal health, contract services, supplementary feeding, agistment and pasture costs. Figure 6 and Table 2 show the largest cost was purchased feed and agistment (seen as dark green), which was mainly purchased feed as there was minimal agistment by participants. Home grown feed was the other major variable cost.

Total feed costs, including home grown feed, purchased feed and agistment, accounted for 86.7% of total variable costs. See Appendix Table 1 for a breakdown of variable costs as a percentage of total (variable plus overhead) costs.

## Overhead costs

Overhead costs or 'fixed costs' are relatively unresponsive to small changes in the scale of operation of a business. Examples include depreciation, administration, repairs and maintenance and labour. Imputed labour cost is an estimate of the cost of the time spent in the business by people with a share in the business such as the owner, the owner's family or a sharefarmer who owns assets in the business. The imputed labour cost is calculated as \$25 per hour of imputed labour performed by the owner operator and family members.

The average overhead cost of \$2.26/kg MS (16.3 c/l) was 4.3% lower compared with \$2.36/kg MS (17.1 c/l) in 2013/14.

## Earnings before interest and tax

Earnings before interest and tax (EBIT) are the gross farm income, less variable costs and overhead costs including non-cash costs. As EBIT excludes tax and interest and lease costs, it can be used to analyse the operational efficiency of the whole farm business.

Average EBIT increased by 36.5% from \$1.59/kg MS (11.5 c/l) in 2013/14 to \$2.17/kg MS (15.7 c/l) in 2014/15.

**Figure 6** Average farm financial performance per kilogram of milk solids



**Table 2** Average farm financial performance per kilogram of milk solids

Farm income and cost category	Statewide	
	kg MS	c/l
<b>Income</b>		
Feed inventory change	\$0.10	0.7
Other farm income	\$0.03	0.2
Livestock trading profit	\$1.05	7.6
Milk income (net)	\$7.07	51.1
<b>Total income</b>	<b>\$8.26</b>	<b>59.7</b>
<b>Variable costs</b>		
Shed cost	\$0.26	1.9
Herd cost	\$0.25	1.8
Home grown feed cost	\$1.19	8.6
Purchased feed and agistment	\$2.12	15.3
<b>Total variable costs</b>	<b>\$3.82</b>	<b>27.6</b>
<b>Gross margin</b>		
<b>per kilogram of milk solids</b>	<b>\$4.44</b>	<b>32.1</b>
<b>Overhead costs</b>		
All other overheads	\$0.26	1.9
Repairs and maintenance	\$0.48	3.4
Depreciation	\$0.26	1.9
Employed labour	\$0.73	5.3
Imputed owner/operator and family labour	\$0.53	3.8
<b>Total overhead costs</b>	<b>\$2.26</b>	<b>16.3</b>
<b>Earnings before interest and tax</b>		
<b>per kilogram of milk solids</b>	<b>\$2.17</b>	<b>15.7</b>

## Return on assets and equity

Return on assets (RoA) is the EBIT expressed as a percentage of total farm assets under management and hence is an indicator of the earning power of total assets, irrespective of capital structure. Similarly, it can be considered as an indicator of the overall efficiency of use of the resources that are involved in a given production system and not elsewhere in the economy.

The average RoA for participants was 6.7%, up from last year's 4.6% ranging from -2.8% to 13.8% (Figure 7). A higher proportion of farms (62%) recorded a RoA higher than 5% compared to 37% last year. Six farms

achieved a RoA greater than 10% compared to none last year.

The market value of land varied widely across the 29 farms in the group, depending on location and land capability. While the average land value was \$14,074/ha across all farms (\$13,719/ha average for the top 25%) there were six farms with land values of less than \$10,000/ha and two farms greater than \$20,000/ha. As a result, this wide variation of land asset values has a significant impact on return on asset figures.

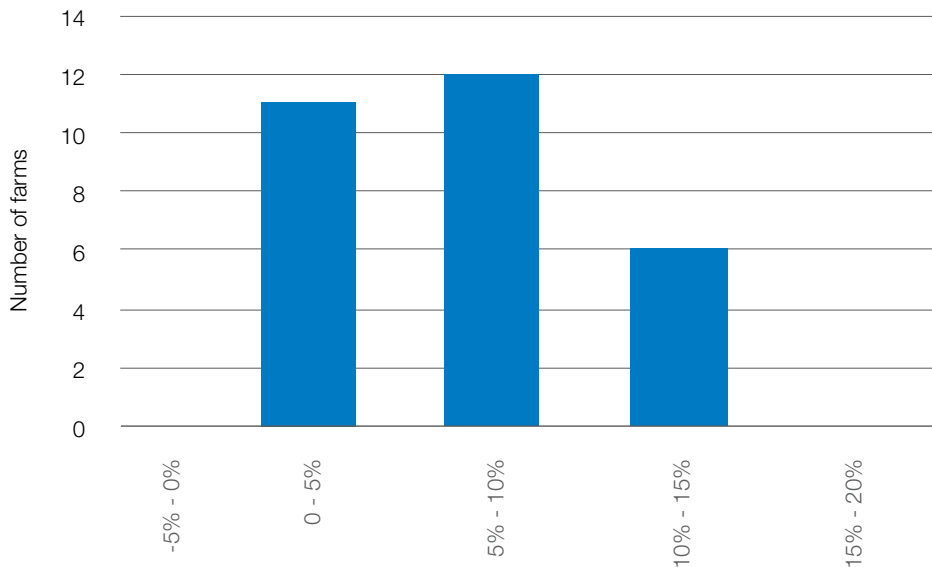
Return on equity (RoE) is the net farm income (earnings before interest and tax less interest and lease charges) expressed as a percentage of

owner's equity. Items not accounted for in net farm income are capital expenditure, principal loan repayments and tax. Return on equity is a measure of the owners' rate of return on their investment.

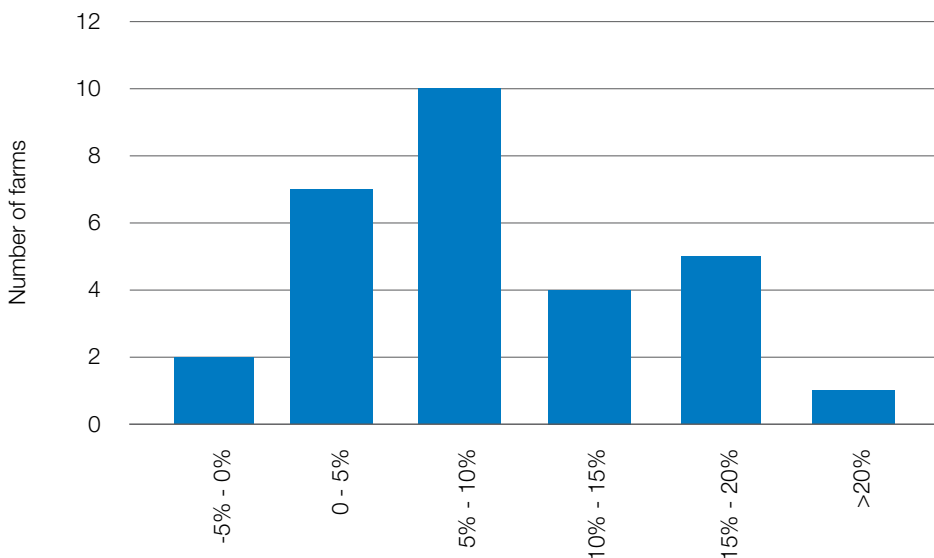
The average return on equity (RoE) for the 29 farms was 9.0% in 2014/15 in contrast to 5.2% last year. RoE ranged from -3.0% to 37.6% with a relatively uniform distribution (Figure 8).

Further discussion of return on assets and return on equity occur in the risk section below. Appendix Table 1 presents all the return on assets and return on equity for the participant farms.

**Figure 7** Distribution of farms by return on assets (excl. Capital Appreciation)



**Figure 8** Distribution of farms by return on equity



## Risk

“Risk is conventionally classified into two types: business risk and financial risk. Business risk is the risk any business faces regardless of how it is financed. It comes from production and price risk, uncertainty and variability. ‘Business risk’ refers to variable yields of crops, reproduction rates, disease outbreaks, climatic variability, unexpected changes in markets and prices, fluctuations in inflation and interest rates, and personal mishap. ‘Financial risk’ derives from the proportion of other people’s money that is used in the business relative to the proportion of owner-operator’s capital...”<sup>2</sup>

Table 3 presents some key risk indicators. Refer to Appendix 2 Glossary of Terms for the definition of terms used in Table 3.

All but one farm in the project rely on imported feed for at least 25% of the herd’s feed requirement. With an average of 37% of feed imported, WA dairy farms are exposed to fluctuations in prices and supply in the feed market. The percentage of

imported feed ranged from 12% to 59% between farms reflecting the range in production systems within the WA dairy industry.

The average price of purchased feed was \$391/t DM, similar to 2013/14, and ranged from \$275/t DM to \$531/t DM.

Equity levels averaged 78%.

The cost structure ratio provides variable costs as a proportion of total costs. A lower ratio implies that overhead costs comprised a greater proportion of total costs which in turn indicates less flexibility in the business. Table 3 shows that across the state for every \$1.00 spent, \$0.63 was used to cover variable costs. One hundred minus this percentage gives the proportion of total costs that are overhead costs.

The debt services ratio shows interest and lease costs, as a proportion of gross farm income. This year’s ratio of 7.1% indicates that on average farms repaid \$0.07 of every dollar of gross farm income to their creditors, which was 13% less than last year’s debt service ratio of 8.2%.

The benefit of taking risks and borrowing money can be seen when farm incomes yield a higher return on equity than on their return on assets. In 2014/15, 21 of the 29 of participant farms (72%) received a return on equity greater than their return on assets. This was an increase from 2013/14, where 17 of 30 farms (57%) recorded a higher return on equity figure.

The higher the risk indicator (or lower with equity %) in Table 3, the greater the exposure to the risk of a shock in those areas of the business. Appendix Tables 4 and 5 show the variable and overhead costs incurred by individual farms expressed in \$/kg MS sold. This data set is best used as risk indicators, given it is measured against the product produced and sold currently and not the capital invested.

<sup>2</sup> Malcolm, L.R., Makeham, J.P. and Wright, V. (2005), *The Farming Game, Agricultural Management and Marketing*, Cambridge University Press, New York. p180

**Table 3** Risk indicators

	Average	Top 25%
Cost structure (proportion of total costs that are variable costs)	63%	65%
Debt services ratio (percentage of income as finance costs)	7.1%	5.1%
Debt per cow	\$2,798	\$2,353
Equity percentage (ownership of total assets managed)	78%	81%
Percentage of feed imported (as a % of total ME)	37%	43%



# Physical measures

## Feed consumption

The contribution of different feed sources to the total metabolisable energy (ME) consumed on the whole farm usable area, including milking and non-milking area, is presented in Figure 9. This includes feed consumed by dry cows and young stock.

A cow's diet can consist of grazed pasture, harvested forage, crops, concentrates and other imported feeds.

In Western Australia, 68% of the diet ME is forage based; with grazed pasture the major component of the cows' diet at 47%.

Concentrates supply the greatest proportion of ME of all the supplements fed, accounting for 32% of the diet.

The remainder of the diet ME was supplied by silage (15%) and hay (6%).

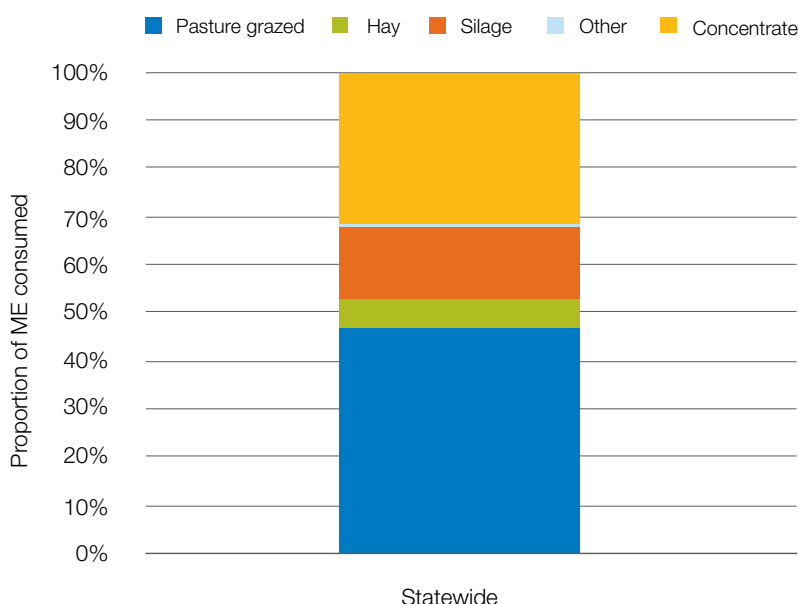
Appendix Table 3 provides further information on purchased feed.

The average estimated home grown feed consumed of 6.3 t DM per milking hectare is shown in Figure 10. This is a combination of 4.6 t DM/ha directly grazed pasture on the milking area on average shown by the blue shading and 1.7 t DM/ milking ha of conserved feed on average as shown by the green shading. Both Figures 9 and 10 were estimated using DEDJTR's Pasture Consumption Calculator which is also available online at [dairypastureconsumptioncalculator.com.au](http://dairypastureconsumptioncalculator.com.au). Initially, this involves a calculation based on the total ME required on the farm, determined by stock numbers on the farm, liveweight, average distance stock walk to and from the dairy and milk production. Metabolisable energy imported from other feed sources is subtracted from the total farm ME requirements over the year to estimate total ME produced on farm, divided into grazed and conserved feed depending on the quantity of fodder production recorded.

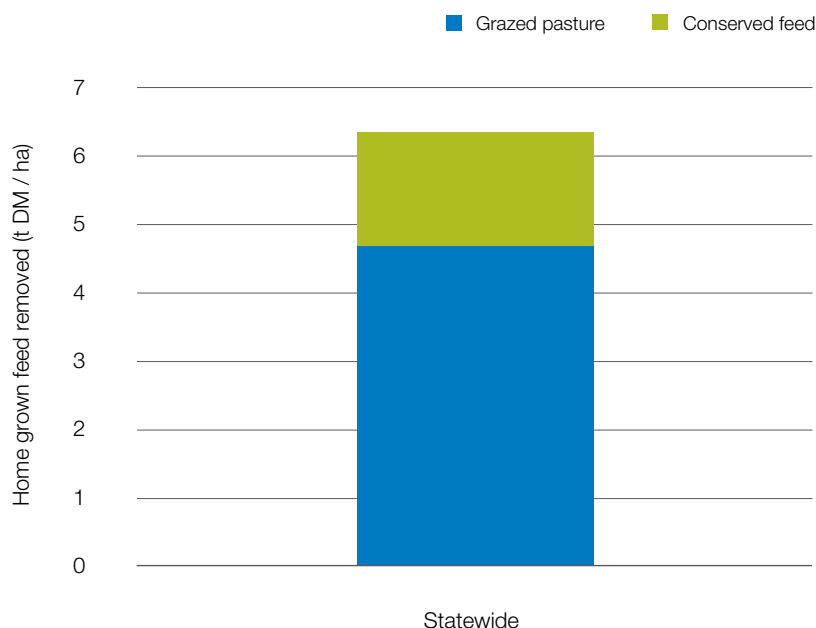
Appendix Table 2 gives estimates of quantity of home grown feed consumed per usable hectare of sample farms across the state. This year the average directly grazed pasture on the usable area was 3.6 t DM/ha and conserved feed

averaged 1.7 t DM/ha on the usable area. The graph in Figure 10 accounts only for the consumption of pasture that occurred on the milking area whether by milking, dry or young stock.

**Figure 9** Sources of whole farm metabolisable energy



**Figure 10** Estimated tonnes of home grown feed consumed per milking hectare



## Fertiliser application

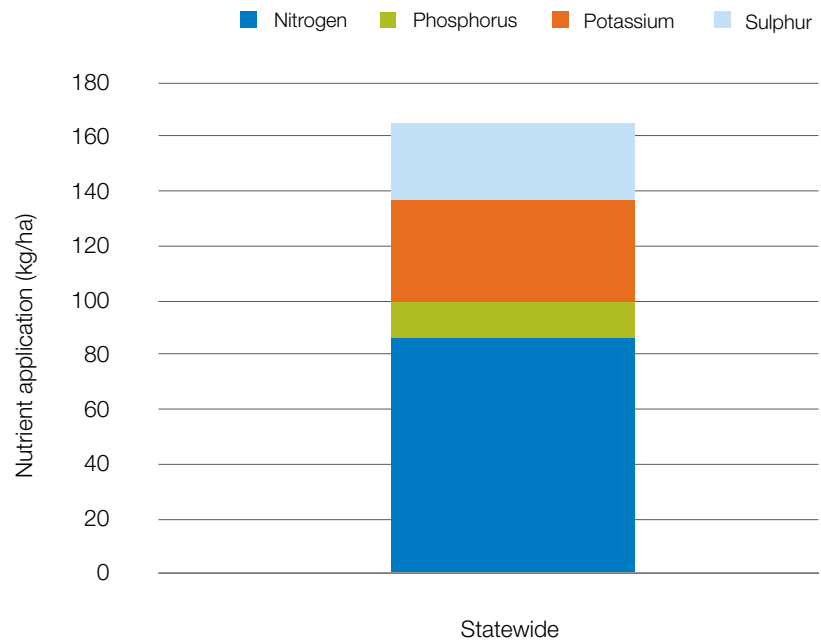
Application of nutrients between 2014/15 and 2013/14 did not vary greatly.

The total nutrient use was 170 kg/ha comprising of 89 kg/ha nitrogen, 14 kg/ha phosphorus, 39 kg/ha potassium and 30 kg/ha sulphur (Figure 11).

It should be noted that water availability, pasture species, soil type, pasture management, seasonal variation in response rates to fertilisers, variations in long-term fertiliser strategies plus other factors will all influence pasture growth and fertiliser application strategies. These particular strategies are not captured as part of this project.

Appendix Table 2 provides further information on fertiliser application.

**Figure 11** Nutrient application per hectare



## Milk production versus calving pattern

Figure 12 shows the average milk sales for all participant farms against the monthly distribution of calves born.

Average monthly distribution of milk production in WA reflects the cost of producing milk in a Mediterranean climate (hot dry summers and mild wet winters) together with processors' requirement for a flatter milk supply for the liquid milk market.

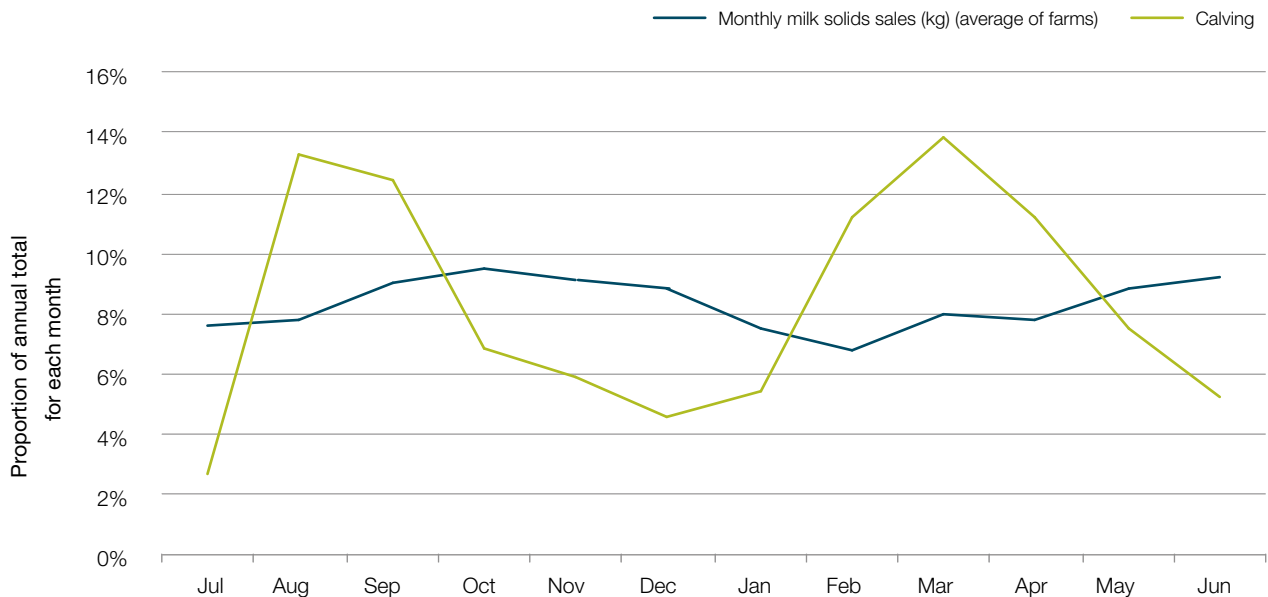
Peak milk production is in spring when pasture growth is greatest and conversely milk production is lowest in summer when reliance on supplements and irrigation is greatest. This is reflected in a peak to trough ratio of 1.27; with 9.5% of annual milk produced in October compared to 6.8% in February.

Most WA herds have a split calving pattern being spring and autumn. Many factors influence choice of calving pattern on individual farms including matching feed supply with

animal demand, receiving seasonal milk price, rainfall and irrigation, ease of management and herd fertility management.

The 29 participant farms calved 33% of their cows in August to October and another 36% in February to April. However within this sample, irrigation farms would typically calve up to 66% of their cows in spring and 33% in autumn. Dryland farms would typically calve up to 33% of their cows in spring and 66% in autumn.

**Figure 12** Monthly distribution of milk production versus calves born



# Whole farm analysis

Key whole farm physical parameters for the 29 Western Australian farms are presented in Table 4. The Q1 – Q3 range shows the band in which the middle 50% of farms for each parameter sit. The top 25% refers to the top seven farms based on return on assets.

The physical characteristics of the top 25% of farms (ranked by return on assets) lie within the middle 50% of the West Australian dataset for all physical parameters except for kilograms of milk solids sold per hectare.

The top 25% of farms had 22% higher stocking rate of 1.1 milking cows per usable hectare compared to the state average of 0.9 milking cow per hectare. These farms combined a higher stocking rate with 8% higher milk production per cow at 576 kg MS/cow compared to the average of 535 kg MS/cow. This resulted in the top 25% of farms selling 25% more milk per hectare at 609 kg MS/ha than the average of 486 kg MS/ha for all participant farms.

The top 25% of farms also had a 16% higher labour efficiency, producing 57,997 kg MS/FTE compared to the average of 50,150 kg MS/FTE.

The physical characteristics of the top 25% farms only partly explain their ability to be more profitable. Caution must be taken when looking at these physical parameters in isolation.

## Gross farm income

Gross farm income includes all farm income, whether from milk sales, a change in stock or feed inventories or cash income from livestock trading.

The average gross farm income of \$8.26/kg MS (59.7 c/l) includes milk income of \$7.07/kg MS (51.1 c/l), and all other income of \$1.18/kg MS (8.6 c/l) associated with the dairy business operation. Gross farm income in 2014/15 was 6.6% higher than last year mainly due to higher milk income as all income remained similar between years.

However, there was a large variation in milk income between farms ranging from \$6.10/kg MS to \$8.12/kg MS reflecting a number of factors such as market competition for milk supply, summer growth incentives, milk volume and quality premiums. These factors plus differences in milk components between farms accounted for a variation in milk income of 42.4 c/l to 57.5 c/l.

The top 25% of farms had a 6% higher milk income of \$7.46/kg MS (53.6 c/l) compared to the average of \$7.07/kg MS (51.1 c/l). Figure 13 shows the variation in gross farm

income between participants from \$7.25/kg MS (51.3 c/l) to \$8.83/kg MS (67.7 c/l). This large variation in gross farm income is mainly as a result of a large range to changes in feed inventory of between -\$0.09/kg MS to \$0.44 /kg MS (-1.3 c/l to 8.5 c/l) and a wide range in livestock trading profit between \$0.41/kg MS to \$1.74/kg MS (2.9c/l to 12.1 c/l) for participant farms.

The top 25% of farms received a gross farm income of \$8.57/kg MS (61.6 c/l), consisting of \$7.46/kg MS (53.6 c/l) from milk income and \$1.11/ kg MS (8.0 c/l) from all other income.

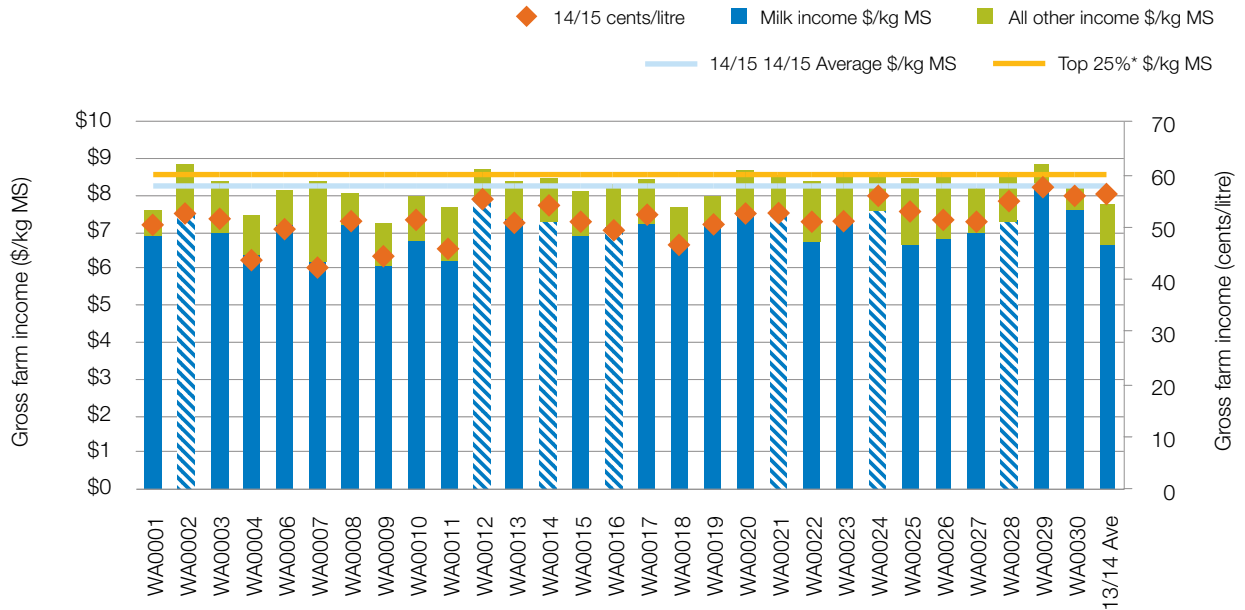
While some farms received high gross income, not all of these farms were in the top 25% based on return on assets. This suggests that the top performing farms have other attributes that enable them to achieve a higher EBIT, other than gross farm income.

**Table 4** Farm physical data

Farm physical parameters	Average	Q1 to Q3 range	Top 25% average
Annual rainfall 14/15 (mm)	882	714 - 1067	858
Water used (irrigation + rainfall) (mm/ha)	930	789 - 1095	889
Total usable area (hectares)	625	372 - 688	601
Milking cows per usable hectare	0.9	0.8 - 1.1	1.1
Milk sold (kg MS/cow)	535	474.6 - 592	576
Milk sold (kg MS/ha)	486	373 - 562	609
Home grown feed as % of ME consumed	63%	57% - 69%	57%
Labour efficiency (milking cows/FTE)	95	81 - 104	101
Labour efficiency (kg MS/FTE)	50,150	41,850 - 55,423	57,997



**Figure 13** Gross farm income per kilogram of milk solid



### Milk solids sold

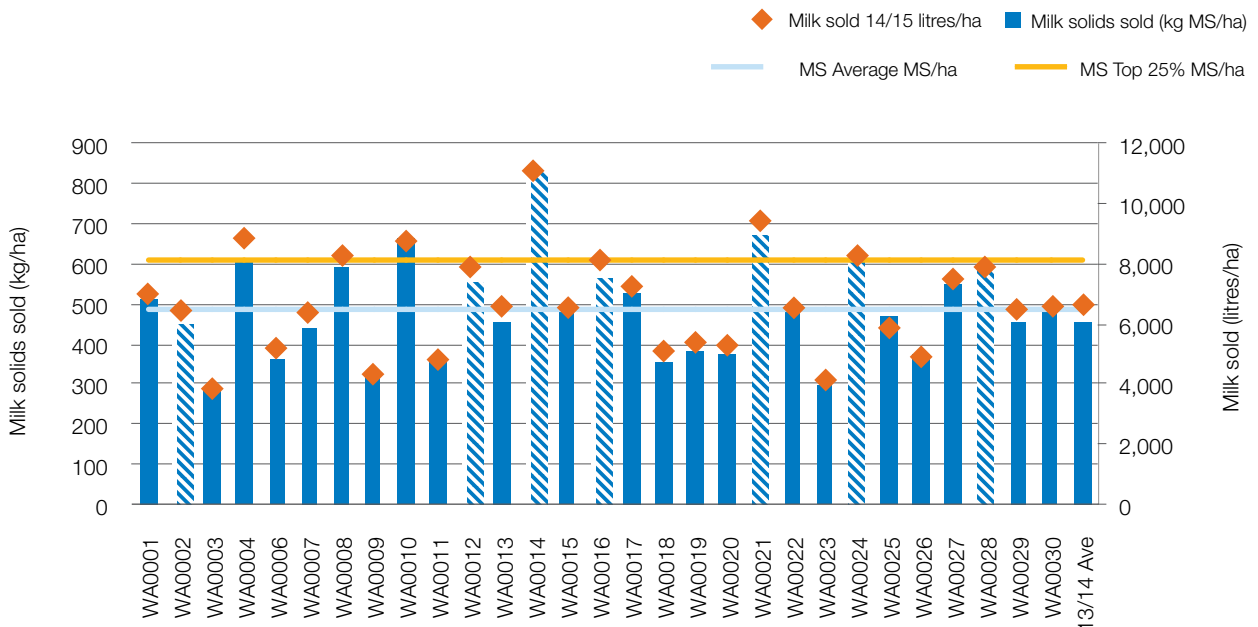
There was a large variation in the amount of milk solids sold per usable hectare with a range of 290 kg MS/ha to 828 kg MS/ha reported (Figure 14). Part of this variation can be accounted for by

farms having runoff areas and out paddocks that were included as part of the total usable area.

The top 25% of farms sold 609 kg MS/ha which was 25% more than the average of 486 kg MS/ha.

The 2014/15 average was 7% higher than last year's average of 453 kg MS/ha. The average kilograms of milk solids sold per cow also increased to 535 kg MS/ha compared to 505 kg MS/cow last year.

**Figure 14** Milk solids sold per hectare



## Variable costs

Variable costs are those costs that change directly according to the amount of output, such as herd, shed and feed costs.

The average variable cost of all participant farms was \$3.82/kg MS (27.6 c/l) as shown in Figure 15. The range was from \$2.82/kg MS to \$5.33/kg MS (20.5 c/l to 39.1 c/l). The average variable cost was relatively similar to last year's average of \$3.79/kg MS. The top 25% had lower variable costs at \$3.61/kg MS (25.9 c/l).

Feed costs were the major variable cost accounting for 87% of total costs. The top 25 of farms feed costs were \$3.06/kg MS (22.1 c/l), 7% less than the average of \$3.31/kg MS (23.9 c/l).

The average price of purchased feed was \$391/t DM, similar to 2013/14, and ranged from \$275 to \$531/t DM.

The percentage breakdown of the variable costs can be found in Appendix Table 6.

## Overhead costs

The calculation of overhead costs in the Dairy Farm Monitor project consists of cash and non-cash costs to the dairy business.

Examples of cash overheads include rates, insurance and employed labour, and non-cash overheads include depreciation and imputed owner/operator and family labour.

Figure 15 further highlights the variation in overhead costs between participant farms with values ranging from \$1.60 to \$3.30/kg MS (11.4 c/l to 24.9 c/l). The top 25% recorded lower overhead costs at \$1.90/kg MS (13.6 c/l) compared to the average of \$2.26/kg MS (16.3 c/l).

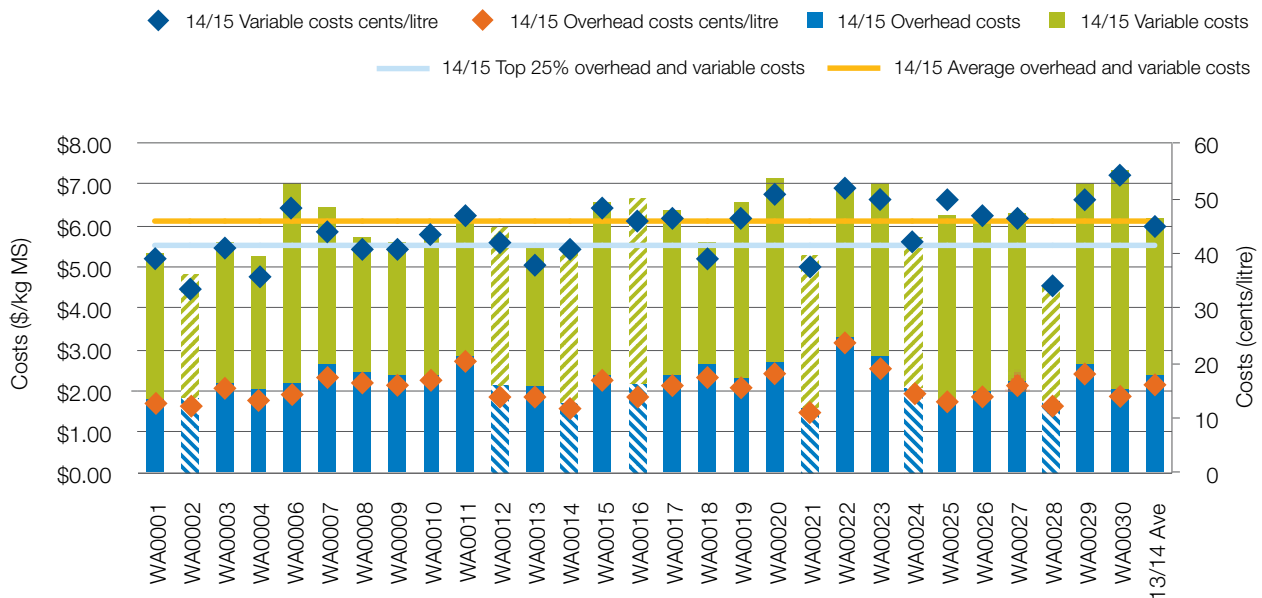
Labour costs, including employed and imputed labour, were the major overhead cost, accounting for 21% of total costs.

The breakdown of overheads cost as expressed in \$/kg MS and as a percentage of total costs for individual farms can be found in Appendix Tables 5 and 7, respectively.

Repairs and maintenance and depreciation are the other two major overhead cost categories. Spending on repairs and maintenance remained similar to the previous year at 8% of costs.

Farms that regularly perform well do so by keeping overhead costs low and manage their variable costs according to the season.

**Figure 15** Whole farm variable and overhead costs per kilogram of milk solids



## Cost of production

Table 5 presents cost of production which includes both variable and overhead costs, as well as changes in fodder inventory and livestock trading losses. Changes in inventory are important to establish the true costs to the business. The changes in fodder inventory count for the net cost of feed from what was fed out, conserved, purchased and stored

over the year. Livestock trading loss is also considered in cost of production; however there was no loss this year for any farms so was not included.

Table 5 shows the average cost of production was \$5.98/kg MS (43.2 c/l), slightly less than last year's \$6.09 (44.2 c/l), with the top 25% of farms 10% lower at \$5.42/kg MS (38.9 c/l).

The average cost of production of the top 25% was 9% lower than participant farms with all costs (except employed labour) being equal to or lower than the average. Having a low cost of production is one key determinant of being in the top 25% of participants in 2014/15.

**Table 5** Cost of production

Farm Costs	Average		Q1 to Q3 range	Top 25% average	
	\$/kg MS	c/l	\$/kg MS	\$/kg MS	c/l
Livestock trading loss	\$0.00	0.0	\$0.00 - \$0.00	\$0.00	0.0
Feed inventory change	-\$0.10	-0.7	-\$0.20 - \$-0.01	-\$0.09	-0.6
<b>Changes in inventory</b>	<b>-\$0.10</b>	<b>-0.7</b>	<b>\$-0.20 - \$-0.01</b>	<b>-\$0.09</b>	<b>-0.6</b>
<b>Variable costs</b>					
Herd costs	\$0.25	1.8	\$0.18 - \$0.29	\$0.27	2.0
Shed costs	\$0.26	1.9	\$0.18 - \$0.30	\$0.26	1.9
Purchased feed and agistment	\$2.12	15.3	\$1.82 - \$2.42	\$2.06	14.7
Home grown feed cost	\$1.19	8.6	\$0.94 - \$1.40	\$1.02	7.3
<b>Total variable costs</b>	<b>\$3.82</b>	<b>27.6</b>	<b>\$3.38 - \$4.23</b>	<b>\$3.61</b>	<b>25.9</b>
<b>Overhead costs</b>					
Rates	\$0.04	0.3	\$0.02 - \$0.05	\$0.03	0.2
Registration and insurance	\$0.02	0.2	\$0.01 - \$0.03	\$0.02	0.1
Farm insurance	\$0.07	0.5	\$0.05 - \$0.09	\$0.06	0.5
Repairs and maintenance	\$0.48	3.4	\$0.38 - \$0.58	\$0.34	2.5
Bank charges	\$0.01	0.1	\$0.00 - \$0.01	\$0.01	0.0
Other overheads	\$0.12	0.9	\$0.07 - \$0.13	\$0.08	0.6
Employed people cost	\$0.73	5.3	\$0.49 - \$0.94	\$0.80	5.7
<b>Total cash overheads (\$/kg MS)</b>	<b>\$1.47</b>	<b>10.6</b>	<b>\$1.31 - \$1.57</b>	<b>\$1.35</b>	<b>9.6</b>
Depreciation	\$0.26	1.9	\$0.18 - \$0.32	\$0.25	1.8
Imputed people cost	\$0.53	3.8	\$0.26 - \$0.76	\$0.30	2.2
<b>Total overhead costs (\$/kg MS)</b>	<b>\$2.26</b>	<b>16.3</b>	<b>\$2.03 - \$2.43</b>	<b>\$1.90</b>	<b>13.6</b>
<b>Total cost of production (\$/kg MS)</b>	<b>\$5.98</b>	<b>43.2</b>	<b>\$5.53 - \$6.40</b>	<b>\$5.42</b>	<b>38.9</b>



### Break-even price required

The break-even price required per kilogram of milk solids sold is calculated as the cost of production less any income from other sources, including livestock trading profit or increase in feed inventory. This is a better relevant risk indicator in

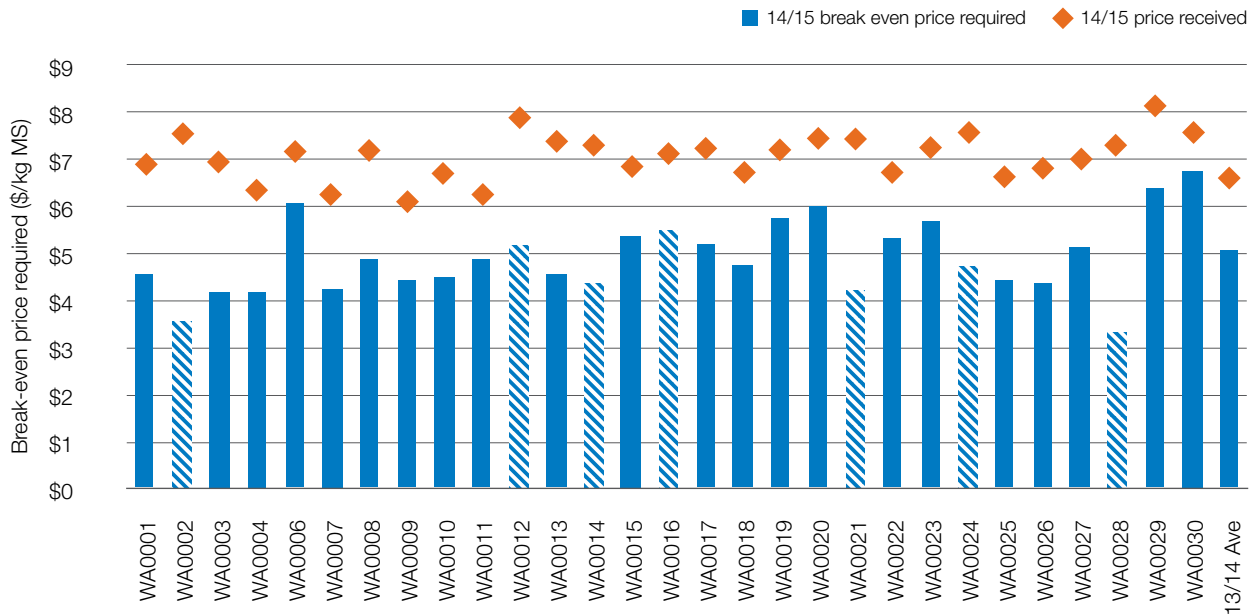
dairying than cost of production as it can be compared directly to the price of the main output in the business, that being milk price.

Figure 16 shows that the break-even price required ranged between \$3.32/kg MS and \$6.75/kg MS (24.8 to 49.5 c/l), with an average of \$4.90/kg MS (35.4 c/l). The average

milk price received was \$7.07/kg MS (51.1 c/l) which was well above the average break-even price required.

The difference between the price received and the break-even price required is the earnings before interest and tax per kilogram of milk solids sold.

**Figure 16** Break even price required per kilogram of milk solids sold



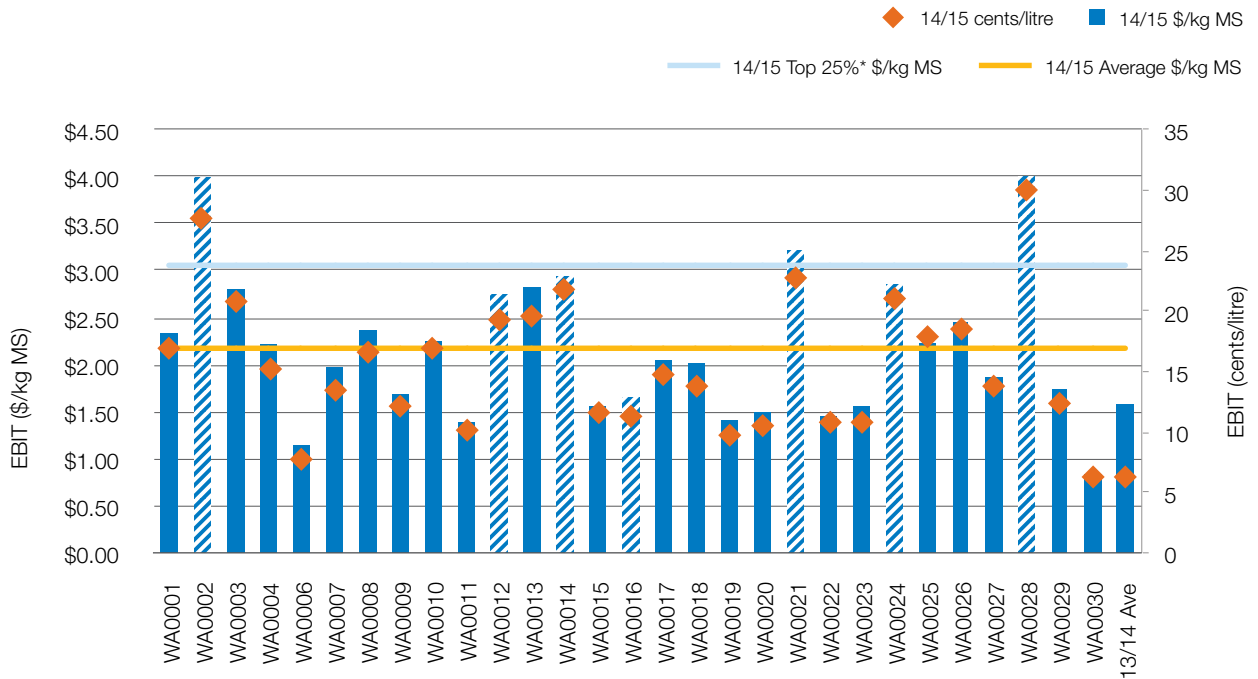
## Earnings before interest and tax

Earnings before interest and tax (EBIT) is the return from all the capital invested in the business and calculated by subtracting variable and overhead costs, including imputed labour costs and depreciation from gross income.

On average, EBIT per kg MS increased to \$2.17/kg MS (15.7 c/l) in 2014/15 from \$1.59/kg MS (11.5 c/l) in 2013/14 (Figure 17). The 36% increase in EBIT was mainly a result of an increase in gross farm income due to the higher milk price in 2014/15.

The strength of the top 25% performers was highlighted with their EBIT of \$3.06/kg MS (22.0 c/l) meaning they were able to retain 36% of their gross farm income compared to 26% for the average.

**Figure 17** Whole farm earnings before interest and tax per kilogram of milk solids sold





## Return on assets and equity

Return on assets is EBIT expressed as a percentage of total assets under management. It is an indicator of the overall earning power of total assets, irrespective of capital structure.

The variation between farms' return on assets reflects the variation between farms' earnings before interest and tax, with differences between those farms with a similar EBIT being explained by the variation in the valuation of the total assets managed. As previously identified in the Statewide Overview section, the market value of land varied widely across the 29 participant farms depending on

location and land capability. While the average land value was \$14,074/ha across all farms (\$13,719/ha average for the top 25%) there were six farms with land values less than \$10,000/ha and two farms with land values greater than \$20,000/ha.

All farms in the project returned a positive return on assets (RoA) ranging from 2.8% to 13.8% during 2014/15. The average RoA for all farms was 6.7%, being 46% higher than 2013/14. The top 25% farms recorded an average return on assets of 11.2%, being 55% higher than 2013/14.

Return on equity is a measure of the owner's rate of return on investment.

It is calculated as EBIT minus interest and lease costs expressed as a percentage of owner's equity. Figures 18 and 19 were calculated excluding capital appreciation. For return on equity including capital appreciation, as well as individual farm results, refer to Appendix Table 1.

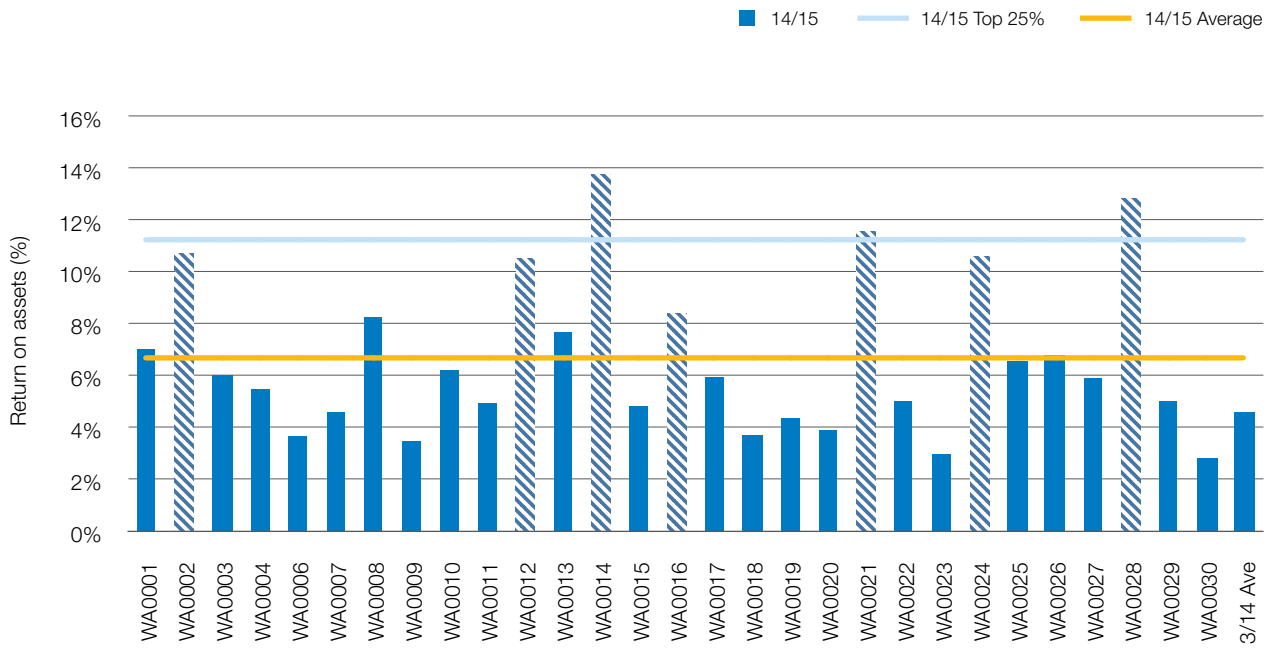
Participants averaged a 9.0% return on equity this year, a 73% increase from an average of 5.2% last year. All but two farms recorded a positive return on equity with individual farm variation shown in Figure 19.

The average return on equity of the top 25% of farms was 14.2%, which was 45% higher than the 9.8% reported in 2013/14.

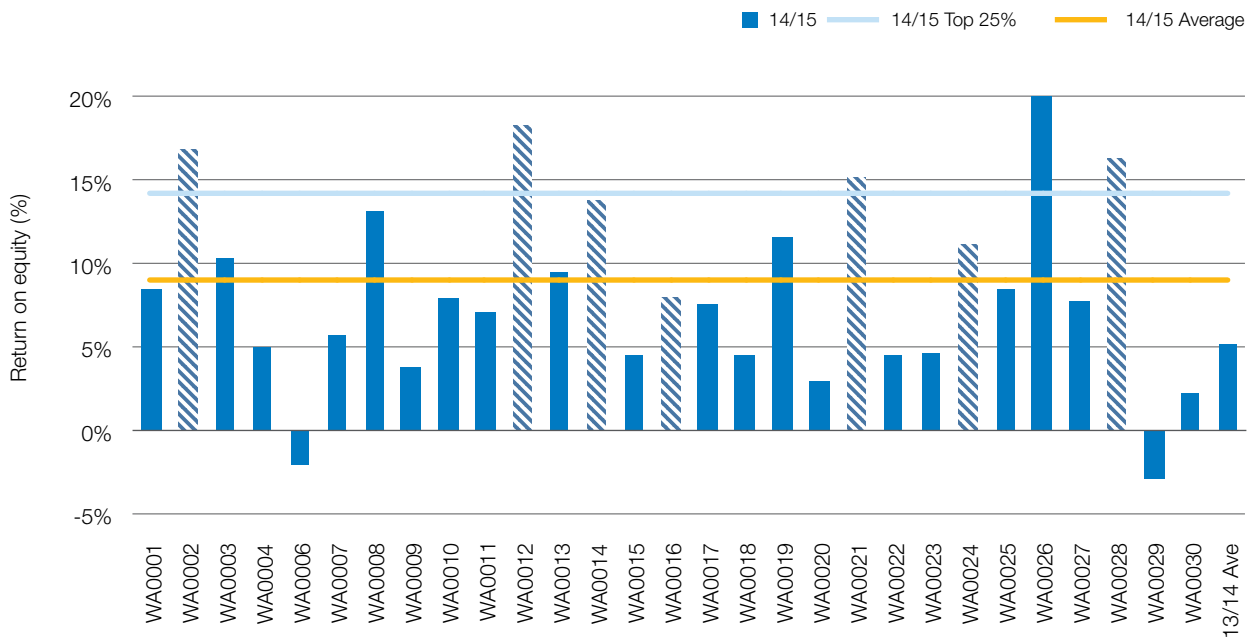




**Figure 18** Return on assets



**Figure 19** Return on equity



# Physical measures

Participant farms sourced 47% of their metabolisable energy (ME) from directly grazed pasture and overall 63% of their metabolisable energy came from home grown feed. Concentrates provided 32% of metabolisable energy.

## Feed consumption and fertiliser

On participant farms, 69% of the diet ME is forage based, with grazed pasture the major component of the cows' diet at 47% similar to the 46% last year.

Concentrates supplied the greatest proportion of ME of all the supplements fed, accounting for 33% of the diet, compared to 33% in 2013/14.

The remainder of the diet ME was supplied by silage (15%) and hay (6%).

Figure 20 shows the relative contribution of each feed type to the ME consumption on farm.

Home grown feed can be grazed pasture (shown by the bottom blue bars in Figure 21) and conserved pasture (shown by the top green bars).

The average total pasture harvested (grazed and conserved) from the milking area was 6.3 t DM/ha.

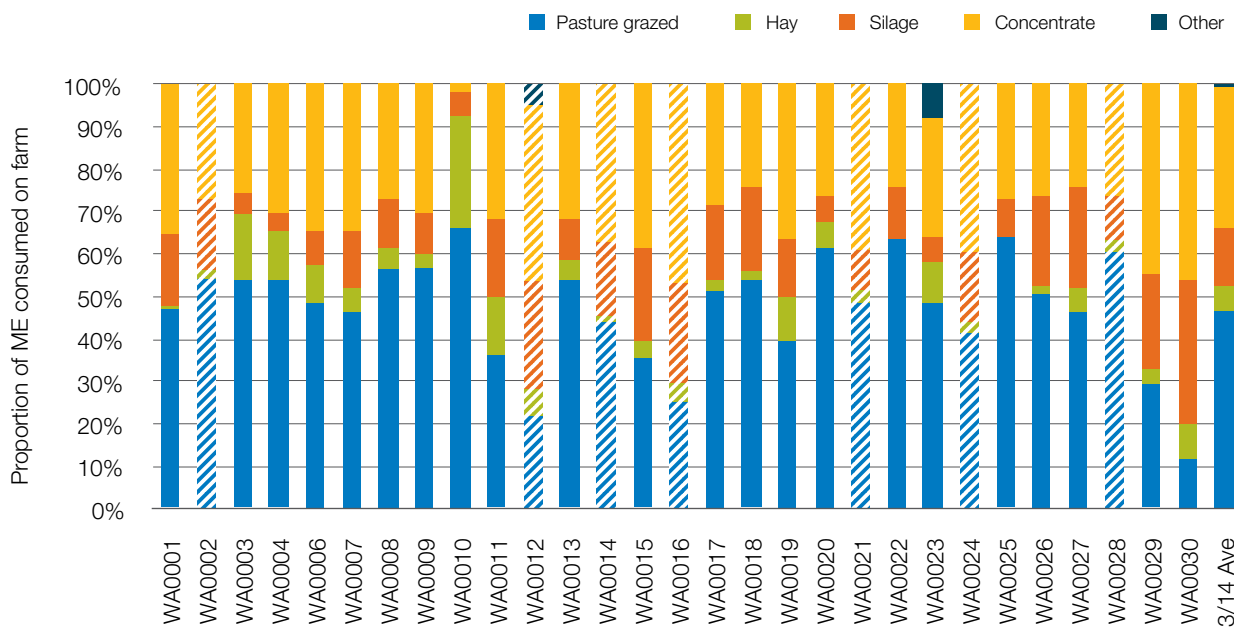
The amount of pasture consumed as grazed feed on the milking area this year averaged 4.6 t DM/ha, ranging from 1.7 t DM/ha to 8.6 t DM/ha.

In some instances it was difficult to track the allocation of different feeds to different classes of stock across the whole farm. For this reason where the feed consumption parameters are reported for milking area there may still be some farms where this parameter may not be as accurate as the feed consumption parameter reported for the entire usable area of the farm.

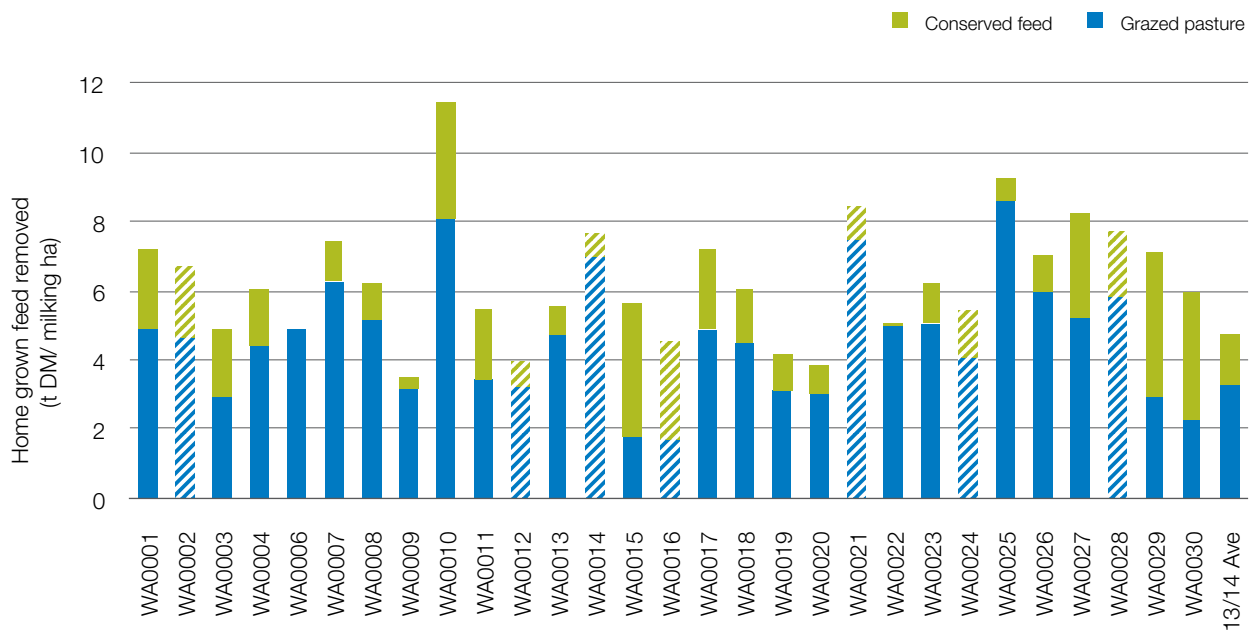
It should be noted that there can be a number of sources of error in the method used to calculate home pasture consumption including incorrect estimation of liveweight,

amounts of fodder and concentrates fed, ME concentration of fodder and concentrate, ME concentration of pasture, wastage of feed and associative effects between feeds when they are digested by the animal. Comparing pasture consumption estimated using the back calculation method between farms can lead to incorrect conclusions due to errors in each farm's estimate and it is best to compare pasture consumption on the same farm over time using the same method of estimation.

**Figure 20** Sources of whole farm metabolisable energy



**Figure 21** Estimated tonnes of home grown feed consumed per milking hectare



### Fertiliser application

Western Australian farms used a wide range of fertilisers and fertiliser application rates, both between farms and with the mix of key macronutrients on individual farms.

Average nutrient applications in 2014/15 were similar to 2013/14 applications.

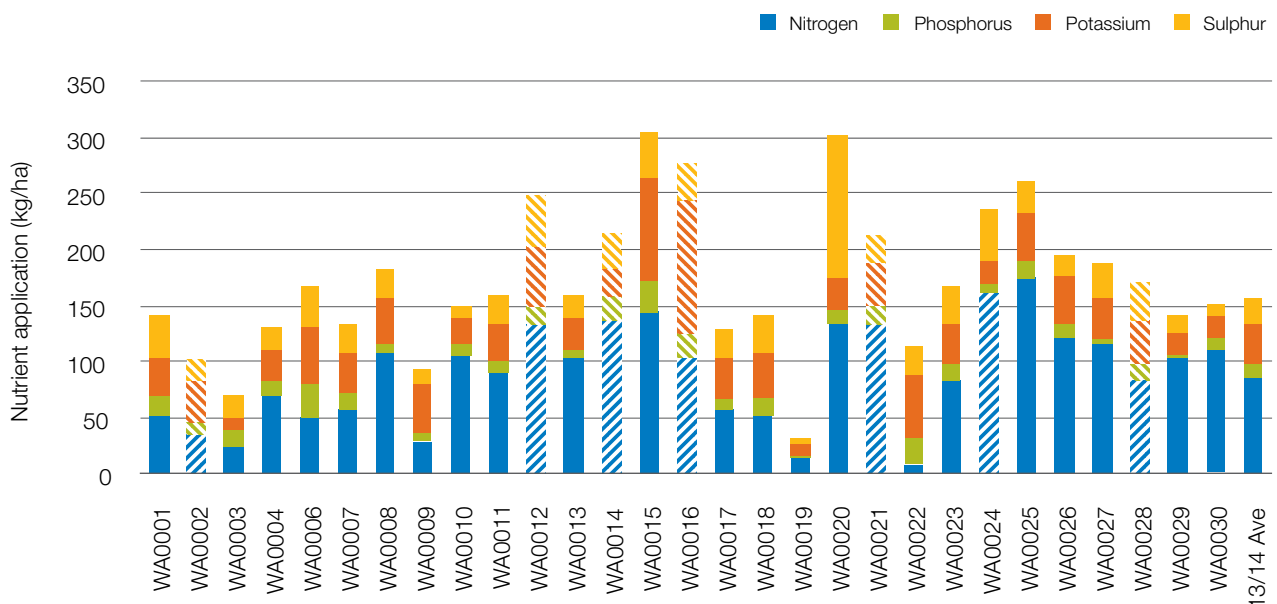
Nitrogen applied varied from 8 kg N/ha up to 176 kg N/ha, with the group average at 89 kg N/ha (Figure 22).

Farms in the top 25% applied 26% more nitrogen than average at 112 kg /ha; similar phosphorus at 16 kg P/ha compared to 14 kg P/ha; 23% more potassium at 48 kg K/ha compared to 39 kg K/ha and more sulphur at 33 kg S/ha compared to 30 kg S/ha.

There does not appear to be any degree of correlation between the pasture harvested (either directly by the cow or mechanically) and fertiliser application rates as seen in Figures 21 and 22.

It should also be recognised that grazing strategies and timing of rainfall and irrigation scheduling would also impact upon pasture growth and consumption. The values for pasture consumption either directly harvested or by mechanical means on the usable area is presented in Appendix Table 2.

**Figure 22** Nutrient application per hectare





# Business confidence survey



# Expectations

Responses to this business confidence survey were made from August to November 2015 with regard to the 2015/16 financial year and the next five years to 2020/21.

## Expectation for business returns

Following a reasonable 2014/15 year, expectations for the coming season were generally positive with 52% of farmers predicting an improvement in farm business returns and 31% predicting no change in their business returns. Only 10% of farmers predicted a decrease in their business returns while a further 7% were not sure what would happen to their business returns in 2015/16.

Responses to the business confidence survey were made with consideration to all aspects of farming, including climate and market conditions for all products bought and sold.

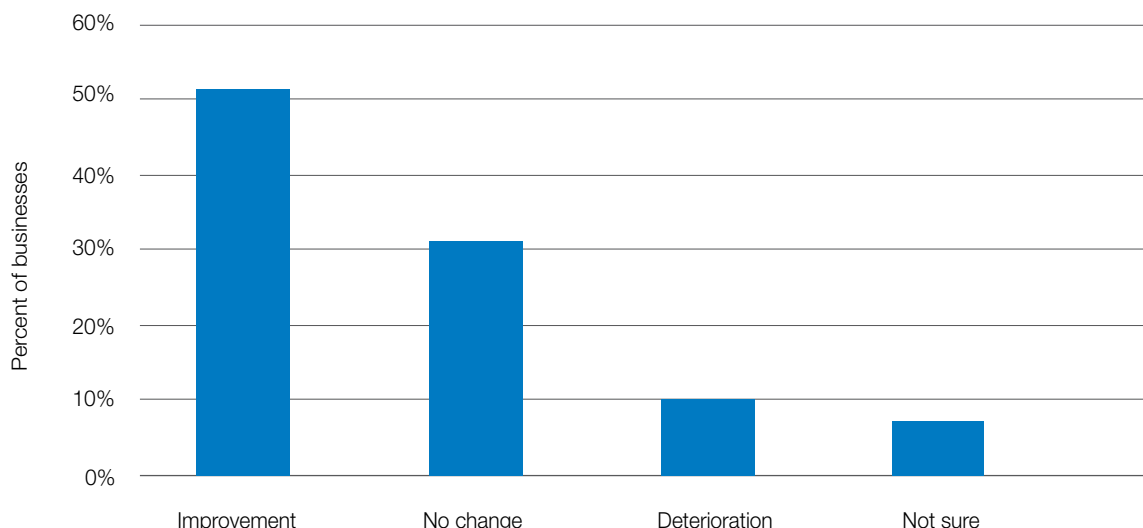
More than half (52%) of respondents were optimistic farm business returns would improve in 2015/16 while a further 31% expected no change to returns (Figure 23). This reflects the growing confidence and buoyancy within the WA dairy industry in

response to growing demand and generally higher milk prices paid in 2014/15.

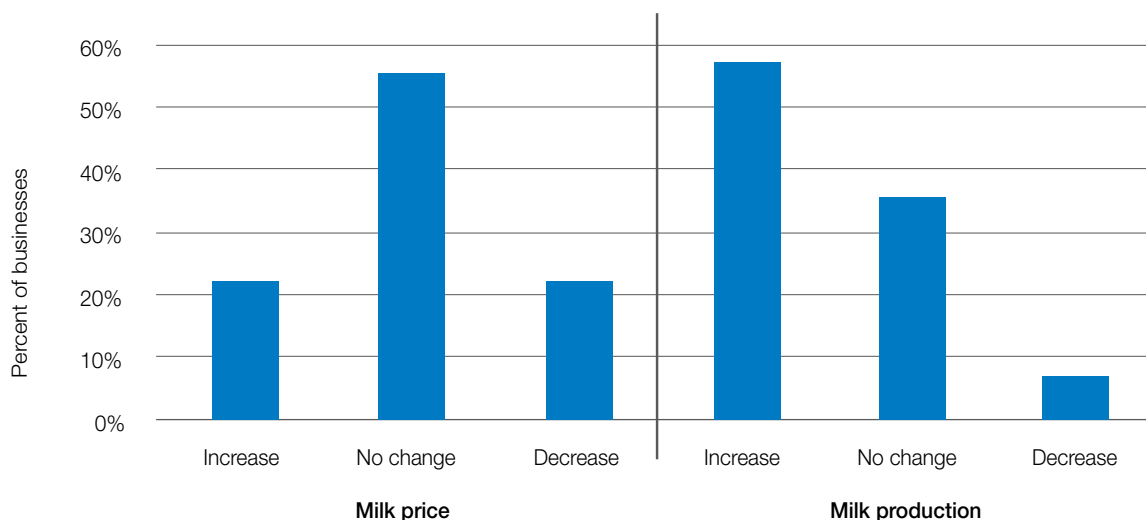
## Price and production expectations – milk

Most of the participant farmers across the state were expecting their milk price to remain stable in 2015/16 (Figure 24). This follows milk price increases for most farms across the state in 2014/15. However, 22% of respondents were predicting their milk price would increase in 2015/16.

**Figure 23** Expected change to farm business returns in 2015/16



**Figure 24** Expectations of prices and production of milk in 2015/16



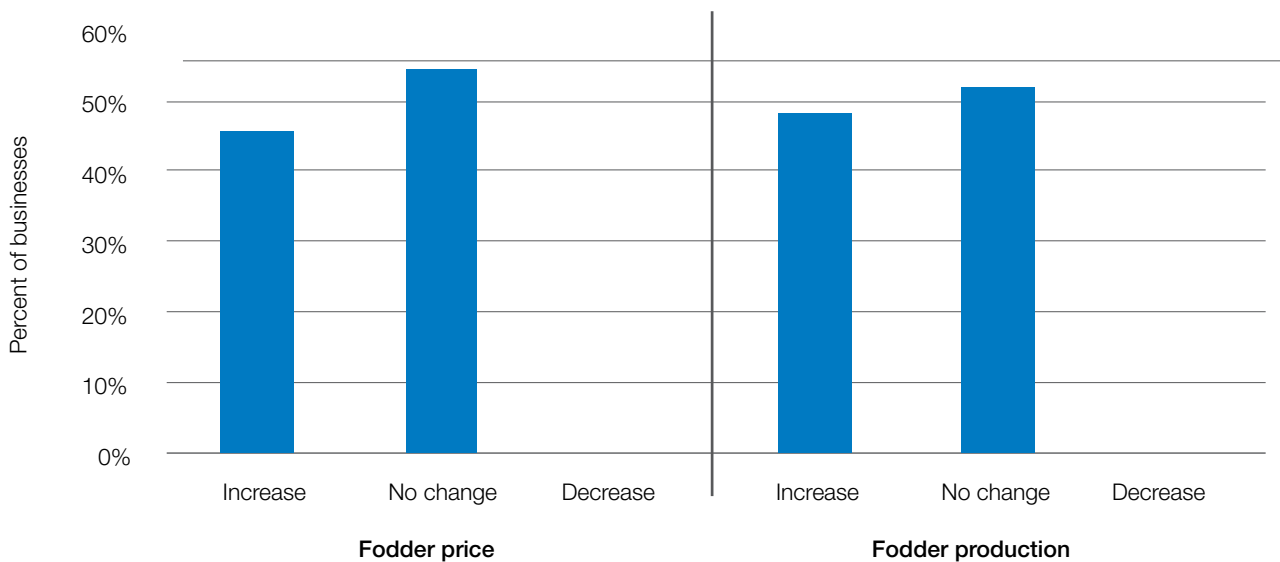


## Price and production expectations – Fodder

The majority of participating farmers expected no change in fodder prices in 2015/16 while 45% expected fodder price to increase (Figure 25).

More farmers (52%) indicated that they expected no change in their fodder production in 2015/16 than those expecting an increase (48%).

**Figure 25** Expectations of prices and production of fodder in 2015/16



## Cost expectations

The majority of farmers expected input costs to remain unchanged or increase in all categories (Figure 26). Over 60% of the participant farmers were not expecting changes to repairs and maintenance costs and half predicted fuel and oil costs for

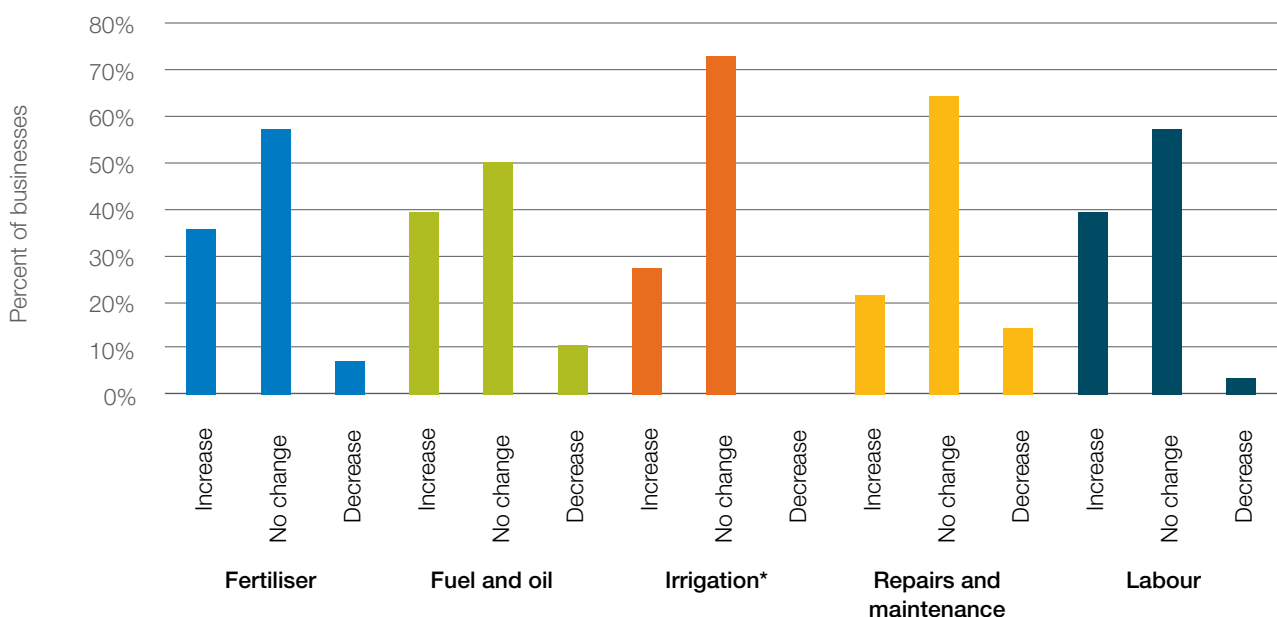
their farm to remain unchanged in the coming year.

Among the irrigators, 27% predicted an increase in irrigation costs to their business. While the majority of the irrigation farms do not expect irrigation costs to increase there is

concern that farms in the Harvey Water Irrigation Area will receive reduced allocation in 2015/16 due to the dry spring in 2015.

The price of labour continues to be an issue and 39% expected it to increase in 2015/16.

**Figure 26** Expectations of costs for the dairy industry in 2015/16



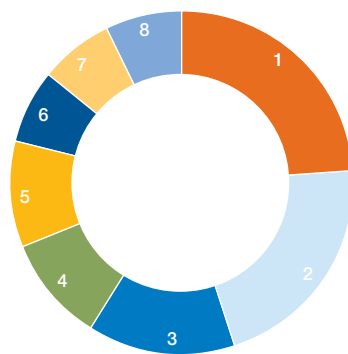


### Major issues facing the dairy industry – the next 12 months

Figure 27 provides a summary of the eight key issues identified by participants for the coming 12 months. A total of 41 responses were recorded from 24 farms; two participating farmers gave “no comment” while three responded with no notable concerns.

Milk price (24% of responses); availability and quality of labour (21%); feed price and efficiency (14%); age and health (10%) and managing seasonal conditions and variability (10%) were the major concerns facing participants for 2015/16.

Farm upgrade, succession planning and work load remained important challenges for the coming year. Other issues mentioned included debt management, water availability and lease of land.



**Figure 27** Major issues for individual businesses – 12 month outlook

- 1 Milk price **24%**
- 2 Labour **21%**
- 3 Feed price and efficiency **14%**
- 4 Age and health **10%**
- 5 Seasonal conditions and variability **10%**
- 6 Farm upgrade **7%**
- 7 Succession planning **7%**
- 8 Work load **7%**

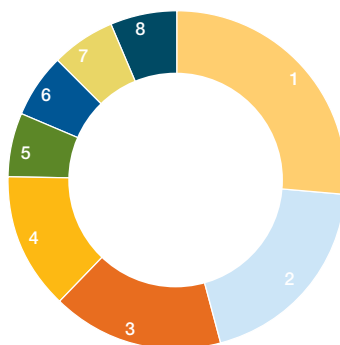
### Major issues facing the dairy industry – the next five years

Participants identified eight key issues for their business over the next five years (Figure 28). A total of 44 responses were recorded from 26 farms with three participants not making any comments.

Retirement and succession planning (26% of responses) was identified as the main issue in the next five years, reflecting the age of some participating farmers. This was followed by labour (19%); milk price (16%) and debt management (13%).

The other major concerns for participants were business planning, financing for business upgrade, interest rates and security of leased land.

A few farmers also made comments on access to suitable land, farm expansion, farm relocation and work-life balance over the next five years.



**Figure 28** Major issues for individual businesses – 5 year outlook

- 1 Retirement and succession planning **26%**
- 2 Labour **19%**
- 3 Milk price **16%**
- 4 Debt management **13%**
- 5 Business planning **6%**
- 6 Financing farm upgrade **6%**
- 7 Interest rate **6%**
- 8 Lease **6%**



## 2014/15 Greenhouse gas emissions





# 2014/15 Greenhouse Gas Emissions

The average level of emission from participating farms was 11.7 t of carbon dioxide equivalents per tonne of milk solids produced (CO<sub>2</sub>-e/t MS) in 2014/15.

Carbon dioxide equivalents (CO<sub>2</sub>-e) are used to standardise the greenhouse potentials from different gases. The Global Warming Potential (GWP) is the index used to convert relevant non-carbon dioxide gases to a carbon dioxide equivalent. This is calculated by multiplying the quantity of each gas by its GWP. All of the data in this section is in CO<sub>2</sub>-e tonnes and expressed per tonne of milk solids produced (CO<sub>2</sub>-e/t MS).

The GWP for the three gases that are discussed in this report are; 1 : 21 : 310 (CO<sub>2</sub> : CH<sub>4</sub> : N<sub>2</sub>O). This means that one CO<sub>2</sub>-e tonne equates to 47.6 kg of methane (CH<sub>4</sub>) and 3.2 kg of nitrous oxide (N<sub>2</sub>O).

The distribution of different emissions for 2014/15 is shown in Figure 29. Greenhouse gas emissions per tonne of milk solids produced ranged from 9.8 t CO<sub>2</sub>-e/t MS to 14.3t CO<sub>2</sub>-e/t MS with an average emission level of 11.7 t CO<sub>2</sub>-e/t MS.

Methane was identified as the main greenhouse gas emitted from dairy farms, accounting for 70% of all greenhouse emissions. There are two main sources of CH<sub>4</sub> emissions on farm: ruminant digestion and anaerobic digestion in effluent management systems. Methane produced from ruminant digestion is known as enteric CH<sub>4</sub> and was the major source of emissions from all farms in this report, with an average of 65% of total emissions. Methane

from effluent ponds accounted for 5% of total emissions on average in 2014/15.

The most efficient strategy to reduce enteric CH<sub>4</sub> production is manipulating the diet by increasing the diet quality through improved pastures or supplementation with particular concentrates. Adding fat supplements into the diet can also reduce CH<sub>4</sub> emissions. This is a simple and effective method however it is recommended that fats should not constitute more than 6-7% of the dietary dry matter intake.

**“Methane was identified as the main greenhouse gas emitted from dairy farms accounting for 70% of all greenhouse emissions in 2014/15.”**

The second main greenhouse gas emission is nitrous oxide accounting for 21.6% of total emissions or 2.5 t CO<sub>2</sub>-e/t MS. Nitrous oxide emissions on dairy farms are primarily derived from direct emissions; including nitrogen fertiliser application, effluent management systems, and animal excreta (dung and urine), as well as indirect emissions such as from ammonia and nitrate loss in soils.

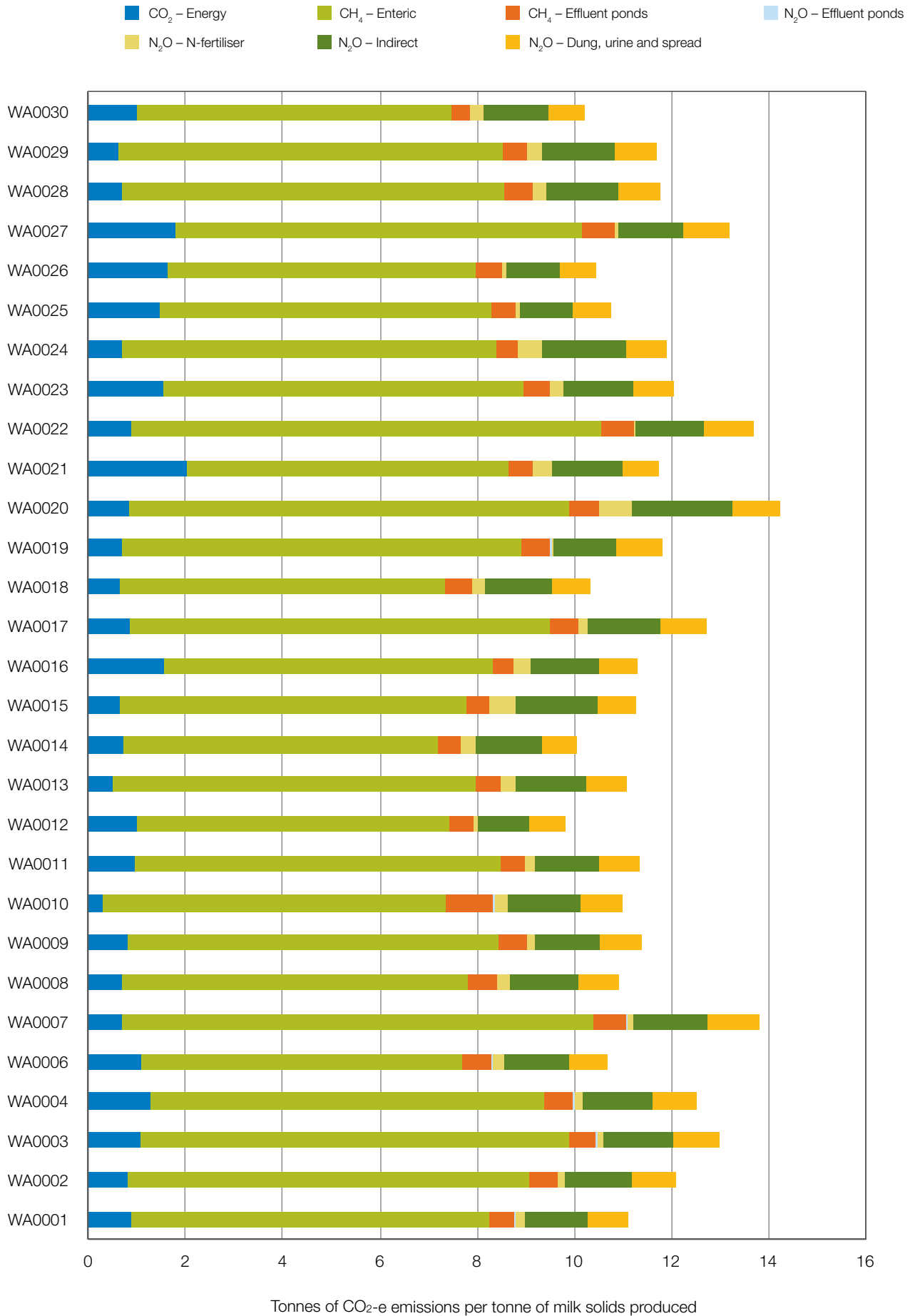
Nitrous oxide emissions from fertiliser accounted for 2.0% of total emissions, effluent ponds accounted for 0.1% and excreta accounted for 7.3%. Nitrous oxide from indirect emissions was 12.1%. Nitrous oxide emissions are highest in warm, waterlogged soils with readily available nitrogen. Over application of nitrogen, high stocking intensity and flood irrigation are all potential causes of increased nitrogen loss as N<sub>2</sub>O. Strategic fertiliser management practices can reduce N<sub>2</sub>O emissions and improve nitrogen efficiency.

The third main greenhouse gas emission is CO<sub>2</sub> which is produced primarily from fossil fuel consumption as either electricity or petrochemicals. Carbon dioxide accounted for 8.5% of total emissions (1.0 t CO<sub>2</sub>-e/t MS). There are a number of technologies available to improve energy efficiency in the dairy while reducing electricity costs.

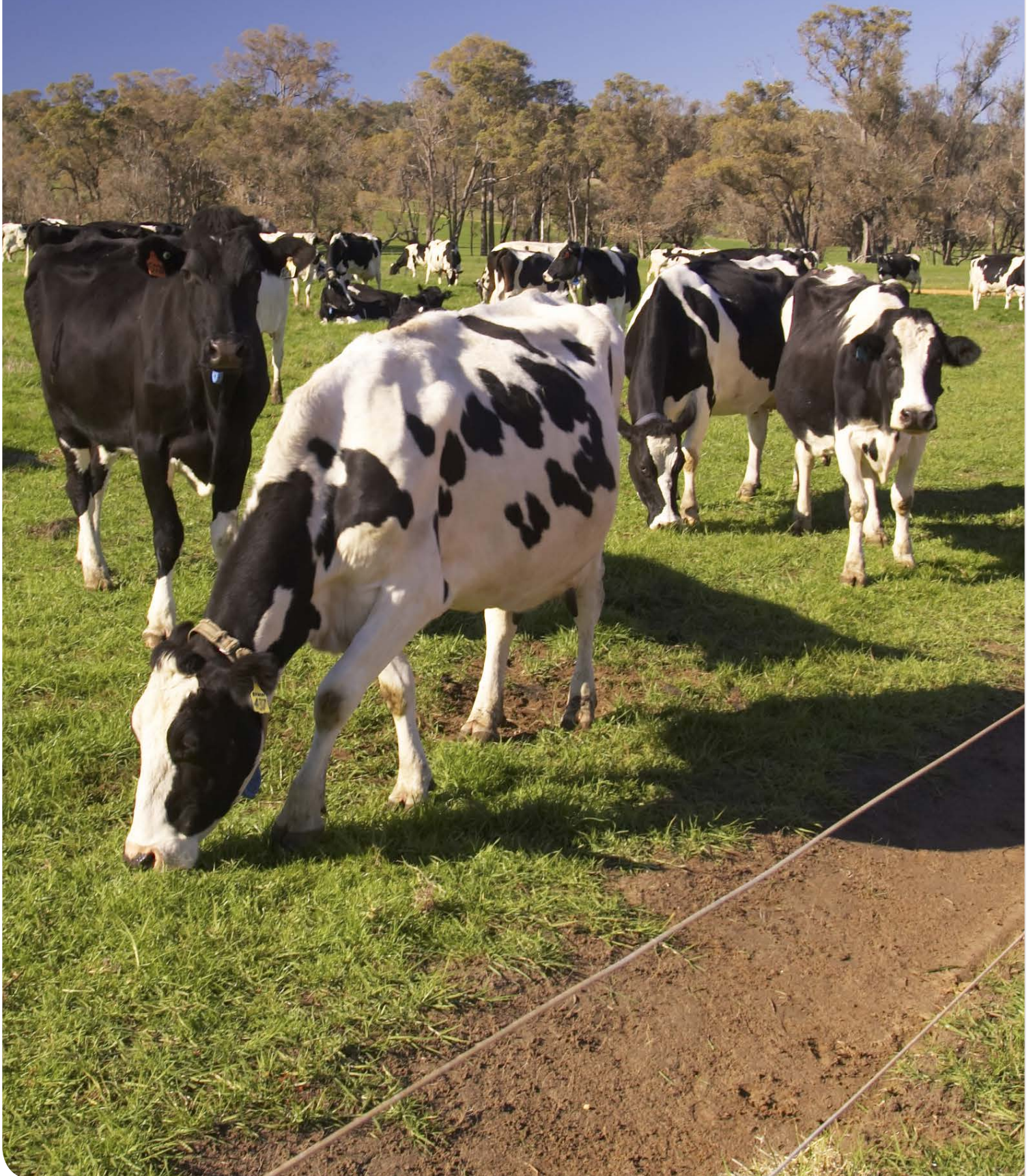
We are currently seeing the importance of understanding and monitoring greenhouse gas emissions, and these are likely to become more important into the future. To find detailed information on the Australian National Greenhouse Gas Inventory, strategies for reducing greenhouse gasses and more details on sources of greenhouse gases on dairy farms visit the Australian Greenhouse Office's website at [environment.gov.au/climate-change](http://environment.gov.au/climate-change)



**Figure 23** Greenhouse gas emissions per tonne of milk solids sold



# Appendices





**Table A1** Main Financial indicators

Farm number	Milk income (net)	All other income	Gross farm income	Total variable costs	Total overhead costs	Cost structure (Variable costs / Total costs)	Earnings Before Interest and Tax	Return on assets (excl. capital apprec.)	Interest and lease charges	Debt servicing ratio	Net farm income	Return on equity	Return on equity (incl. capital apprec.)
	\$/ kg MS	\$/ kg MS	\$/ kg MS	\$/ kg MS	\$/ kg MS	%	\$/ kg MS	%	\$/ kg MS	% of income	\$/ kg MS	%	%
WA0001	\$6.86	\$0.76	\$7.62	\$3.48	\$1.82	66%	\$2.32	7.0%	\$0.64	8.4%	\$1.68	8.5%	8.8%
<b>WA0002</b>	<b>\$7.55</b>	<b>\$1.27</b>	<b>\$8.83</b>	<b>\$2.98</b>	<b>\$1.85</b>	<b>62%</b>	<b>\$3.99</b>	<b>10.7%</b>	<b>\$0.78</b>	<b>8.9%</b>	<b>\$3.21</b>	<b>16.8%</b>	<b>17.5%</b>
WA0003	\$6.94	\$1.45	\$8.39	\$3.38	\$2.21	60%	\$2.79	6.0%	\$0.73	8.7%	\$2.07	10.3%	10.6%
WA0004	\$6.40	\$1.07	\$7.47	\$3.22	\$2.03	61%	\$2.22	5.5%	\$0.65	8.7%	\$1.57	5.1%	5.1%
WA0006	\$7.21	\$0.94	\$8.15	\$4.83	\$2.18	69%	\$1.14	3.7%	\$1.53	18.8%	-\$0.39	-2.1%	-2.1%
WA0007	\$6.22	\$2.18	\$8.40	\$3.79	\$2.64	59%	\$1.97	4.6%	\$0.75	8.9%	\$1.22	5.6%	5.8%
WA0008	\$7.21	\$0.89	\$8.10	\$3.31	\$2.43	58%	\$2.35	8.3%	\$0.21	2.6%	\$2.14	13.1%	13.0%
WA0009	\$6.10	\$1.16	\$7.25	\$3.19	\$2.38	57%	\$1.68	3.5%	\$0.29	4.0%	\$1.40	3.8%	3.8%
WA0010	\$6.76	\$1.20	\$7.96	\$3.36	\$2.36	59%	\$2.24	6.2%	\$0.19	2.4%	\$2.06	7.9%	8.1%
WA0011	\$6.22	\$1.46	\$7.68	\$3.42	\$2.88	54%	\$1.38	5.0%	\$0.70	9.1%	\$0.69	7.2%	7.3%
<b>WA0012</b>	<b>\$7.91</b>	<b>\$0.79</b>	<b>\$8.71</b>	<b>\$3.82</b>	<b>\$2.13</b>	<b>64%</b>	<b>\$2.75</b>	<b>10.5%</b>	<b>\$0.56</b>	<b>6.4%</b>	<b>\$2.19</b>	<b>18.3%</b>	<b>16.7%</b>
WA0013	\$7.37	\$0.99	\$8.36	\$3.43	\$2.11	62%	\$2.82	7.7%	\$0.25	3.0%	\$2.58	9.4%	9.3%
<b>WA0014</b>	<b>\$7.30</b>	<b>\$1.16</b>	<b>\$8.45</b>	<b>\$3.80</b>	<b>\$1.72</b>	<b>69%</b>	<b>\$2.94</b>	<b>13.8%</b>	<b>\$0.00</b>	<b>0.1%</b>	<b>\$2.94</b>	<b>13.8%</b>	<b>13.9%</b>
WA0015	\$6.91	\$1.21	\$8.11	\$4.15	\$2.40	63%	\$1.56	4.8%	\$0.21	2.6%	\$1.35	4.6%	4.6%
<b>WA0016</b>	<b>\$7.12</b>	<b>\$1.19</b>	<b>\$8.31</b>	<b>\$4.49</b>	<b>\$2.18</b>	<b>67%</b>	<b>\$1.65</b>	<b>8.4%</b>	<b>\$0.76</b>	<b>9.1%</b>	<b>\$0.89</b>	<b>8.0%</b>	<b>8.2%</b>
WA0017	\$7.24	\$1.21	\$8.45	\$4.04	\$2.37	63%	\$2.05	6.0%	\$0.43	5.1%	\$1.62	7.7%	7.9%
WA0018	\$6.75	\$0.89	\$7.64	\$2.96	\$2.67	53%	\$2.02	3.7%	\$0.33	4.4%	\$1.68	4.4%	4.5%
WA0019	\$7.17	\$0.80	\$7.97	\$4.23	\$2.33	64%	\$1.40	4.4%	\$0.39	4.9%	\$1.02	11.6%	11.9%
WA0020	\$7.46	\$1.19	\$8.66	\$4.48	\$2.69	63%	\$1.49	3.9%	\$0.88	10.2%	\$0.61	2.9%	2.9%
<b>WA0021</b>	<b>\$7.43</b>	<b>\$1.07</b>	<b>\$8.51</b>	<b>\$3.69</b>	<b>\$1.60</b>	<b>70%</b>	<b>\$3.21</b>	<b>11.6%</b>	<b>\$0.36</b>	<b>4.3%</b>	<b>\$2.85</b>	<b>15.2%</b>	<b>16.2%</b>
WA0022	\$6.74	\$1.62	\$8.36	\$3.60	\$3.30	52%	\$1.45	5.1%	\$0.47	5.6%	\$0.98	4.5%	4.5%
WA0023	\$7.25	\$1.36	\$8.61	\$4.23	\$2.82	60%	\$1.56	3.0%	\$0.83	9.6%	\$0.73	4.6%	4.8%
<b>WA0024</b>	<b>\$7.58</b>	<b>\$1.00</b>	<b>\$8.58</b>	<b>\$3.65</b>	<b>\$2.07</b>	<b>64%</b>	<b>\$2.85</b>	<b>10.6%</b>	<b>\$0.23</b>	<b>2.7%</b>	<b>\$2.62</b>	<b>11.2%</b>	<b>10.6%</b>
WA0025	\$6.63	\$1.83	\$8.47	\$4.47	\$1.77	72%	\$2.23	6.6%	\$0.55	6.5%	\$1.68	8.4%	8.7%
WA0026	\$6.81	\$1.82	\$8.63	\$4.18	\$1.99	68%	\$2.46	6.8%	\$0.92	10.7%	\$1.54	37.6%	43.1%
WA0027	\$6.98	\$1.21	\$8.18	\$4.03	\$2.28	64%	\$1.87	6.0%	\$0.50	6.2%	\$1.37	7.8%	7.8%
<b>WA0028</b>	<b>\$7.32</b>	<b>\$1.25</b>	<b>\$8.57</b>	<b>\$2.82</b>	<b>\$1.75</b>	<b>62%</b>	<b>\$4.00</b>	<b>12.8%</b>	<b>\$0.38</b>	<b>4.4%</b>	<b>\$3.62</b>	<b>16.3%</b>	<b>16.6%</b>
WA0029	\$8.12	\$0.69	\$8.81	\$4.40	\$2.66	62%	\$1.75	5.0%	\$2.06	23.4%	-\$0.31	-3.0%	-3.1%
WA0030	\$7.59	\$0.61	\$8.20	\$5.33	\$2.03	72%	\$0.84	2.8%	\$0.56	6.9%	\$0.28	2.2%	2.9%
<b>Average</b>	<b>\$7.07</b>	<b>\$1.18</b>	<b>\$8.26</b>	<b>\$3.82</b>	<b>\$2.26</b>	<b>63%</b>	<b>\$2.17</b>	<b>6.7%</b>	<b>\$0.59</b>	<b>7.1%</b>	<b>\$1.58</b>	<b>9.0%</b>	<b>9.3%</b>
<b>Top 25%*</b>	<b>\$7.46</b>	<b>\$1.11</b>	<b>\$8.57</b>	<b>\$3.61</b>	<b>\$1.90</b>	<b>65%</b>	<b>\$3.06</b>	<b>11.2%</b>	<b>\$0.44</b>	<b>5.1%</b>	<b>\$2.62</b>	<b>14.2%</b>	<b>14.2%</b>

\* The top 25% are bold and italicised

**Table A2** Physical information

Farm number	Water used	Milking cows per usable area	Milk sold	Milk sold	Fat	Protein
	mm/ha	hd/ha	kg MS/ cow	kg MS/ ha	%	%
WA0001	1,168	1.0	488	513	4.1%	3.3%
<b>WA0002</b>	<b>1,168</b>	<b>0.9</b>	<b>506</b>	<b>449</b>	<b>3.7%</b>	<b>3.2%</b>
WA0003	1,208	0.6	447	290	4.1%	3.3%
WA0004	1,095	1.1	536	606	3.6%	3.2%
WA0006	1,143	0.6	579	363	3.7%	3.2%
WA0007	1,104	1.1	398	437	3.6%	3.2%
WA0008	817	0.9	624	591	3.9%	3.3%
WA0009	1,142	0.7	466	316	4.0%	3.3%
WA0010	789	1.2	563	667	4.2%	3.4%
WA0011	721	0.6	561	357	4.2%	3.2%
<b>WA0012</b>	<b>852</b>	<b>0.9</b>	<b>610</b>	<b>553</b>	<b>3.8%</b>	<b>3.2%</b>
WA0013	809	0.7	642	457	3.7%	3.2%
<b>WA0014</b>	<b>738</b>	<b>1.4</b>	<b>605</b>	<b>828</b>	<b>4.2%</b>	<b>3.3%</b>
WA0015	751	1.0	502	482	4.1%	3.3%
<b>WA0016</b>	<b>796</b>	<b>0.9</b>	<b>635</b>	<b>562</b>	<b>3.9%</b>	<b>3.0%</b>
WA0017	1,095	0.8	649	529	4.0%	3.2%
WA0018	1,065	0.6	563	356	3.9%	3.1%
WA0019	751	0.8	466	381	3.9%	3.1%
WA0020	926	0.8	475	372	3.8%	3.2%
<b>WA0021</b>	<b>1,060</b>	<b>1.2</b>	<b>576</b>	<b>670</b>	<b>3.9%</b>	<b>3.2%</b>
WA0022	894	1.2	412	492	4.2%	3.3%
WA0023	722	0.5	588	293	3.8%	3.2%
<b>WA0024</b>	<b>821</b>	<b>1.0</b>	<b>597</b>	<b>611</b>	<b>4.0%</b>	<b>3.3%</b>
WA0025	1,126	1.0	461	466	4.4%	3.6%
WA0026	969	0.9	431	373	4.1%	3.5%
WA0027	833	1.1	520	547	4.0%	3.3%
<b>WA0028</b>	<b>788</b>	<b>1.2</b>	<b>500</b>	<b>590</b>	<b>4.2%</b>	<b>3.3%</b>
WA0029	869	0.9	522	454	3.7%	3.3%
WA0030	735	0.8	592	488	4.0%	3.3%
<b>Average</b>	<b>930</b>	<b>0.9</b>	<b>535</b>	<b>486</b>	<b>4.0%</b>	<b>3.3%</b>
<b>Top 25%*</b>	<b>889</b>	<b>1.1</b>	<b>576</b>	<b>609</b>	<b>3.9%</b>	<b>3.2%</b>

\* The top 25% are bold and italicised



**Table A2** Physical information (continued)

Farm number	Estimated grazed pasture**	Estimated conserved feed**	Home grown feed as % of ME consumed	Nitrogen application	Phosphorous application	Potassium application	Sulphur application	Labour efficiency	Labour efficiency
	t DM/ ha	t DM/ ha	% of ME	kg/ ha	kg/ ha	kg/ ha	kg/ ha	hd/ FTE	kg MS/ FTE
WA0001	3.7	1.8	64%	51.7	18.6	33.6	36.6	149	73,008
<b>WA0002</b>	<b>4.3</b>	<b>2.1</b>	<b>72%</b>	<b>33.1</b>	<b>10.9</b>	<b>35.8</b>	<b>18.1</b>	<b>113</b>	<b>57,329</b>
WA0003	2.8	1.2	68%	23.0	15.0	11.5	21.2	81	36,083
WA0004	5.4	1.5	66%	68.7	12.6	28.6	20.7	90	48,295
WA0006	2.7	0.5	56%	50.0	29.1	53.0	34.3	87	50,596
WA0007	3.8	2.3	61%	57.4	15.3	35.1	25.8	94	37,420
WA0008	5.2	1.7	69%	108.5	6.9	40.6	25.6	81	50,477
WA0009	2.8	1.1	69%	27.9	9.7	41.6	13.3	90	41,850
WA0010	6.5	2.6	88%	104.3	11.0	23.0	9.9	81	45,562
WA0011	2.0	2.7	67%	90.7	9.9	32.8	26.4	64	36,208
<b>WA0012</b>	<b>1.7</b>	<b>2.5</b>	<b>41%</b>	<b>132.8</b>	<b>16.2</b>	<b>53.8</b>	<b>45.5</b>	<b>73</b>	<b>44,691</b>
WA0013	3.9	0.8	60%	104.0	7.4	26.2	21.1	86	55,423
<b>WA0014</b>	<b>5.1</b>	<b>0.8</b>	<b>49%</b>	<b>136.2</b>	<b>22.1</b>	<b>24.8</b>	<b>31.2</b>	<b>133</b>	<b>80,352</b>
WA0015	2.6	2.9	60%	144.9	26.9	92.7	39.9	107	53,714
<b>WA0016</b>	<b>2.0</b>	<b>2.7</b>	<b>52%</b>	<b>103.4</b>	<b>21.8</b>	<b>118.9</b>	<b>32.7</b>	<b>83</b>	<b>52,705</b>
WA0017	4.7	1.7	66%	57.0	9.1	36.3	26.3	72	46,383
WA0018	2.7	1.3	74%	50.7	16.1	41.5	31.9	67	37,776
WA0019	2.0	1.2	56%	13.7	2.4	10.6	5.6	94	43,663
WA0020	4.1	1.0	69%	133.9	13.7	27.4	127.8	73	34,714
<b>WA0021</b>	<b>4.4</b>	<b>1.2</b>	<b>58%</b>	<b>133.3</b>	<b>16.6</b>	<b>38.4</b>	<b>23.9</b>	<b>95</b>	<b>54,825</b>
WA0022	5.5	0.1	64%	5.4	16.3	40.4	18.2	91	37,664
WA0023	2.3	0.7	58%	82.8	14.4	37.7	33.1	61	35,921
<b>WA0024</b>	<b>4.1</b>	<b>2.3</b>	<b>57%</b>	<b>160.6</b>	<b>8.9</b>	<b>21.4</b>	<b>43.6</b>	<b>99</b>	<b>59,041</b>
WA0025	4.3	1.3	72%	175.5	13.6	43.0	29.0	167	77,169
WA0026	2.6	1.7	72%	120.5	13.9	42.9	16.7	121	52,405
WA0027	4.0	2.6	66%	116.9	4.6	35.9	29.8	104	53,928
<b>WA0028</b>	<b>5.8</b>	<b>1.5</b>	<b>70%</b>	<b>83.3</b>	<b>14.6</b>	<b>38.7</b>	<b>34.1</b>	<b>114</b>	<b>57,034</b>
WA0029	2.1	2.8	55%	102.8	2.8	19.1	17.0	84	44,061
WA0030	0.8	3.2	42%	106.5	11.9	19.5	10.0	95	56,039
<b>Average</b>	<b>3.58</b>	<b>1.7</b>	<b>63%</b>	<b>89.0</b>	<b>13.5</b>	<b>38.1</b>	<b>29.3</b>	<b>95</b>	<b>50,150</b>
<b>Top 25%*</b>	<b>3.93</b>	<b>1.9</b>	<b>57%</b>	<b>111.8</b>	<b>15.9</b>	<b>47.4</b>	<b>32.7</b>	<b>101</b>	<b>57,997</b>

\* The top 25% are bold and italicised  
\*\* on usable area

**Table A3** Purchased feed

Farm number	Purchased feed per milker	Concentrate price	Silage price	Hay price	Other feed price	Average purchased feed price	Average ME of purchased feed	Average purchased feed price	Percent of total energy imported
	t DM/hd	\$/ t DM	\$/ t DM	\$/ t DM	\$/ t DM	\$/ t DM	MJ ME/ kg	c/ MJ	% of ME
WA0001	2.1	\$381		\$261		\$379	13.4	2.9	36%
<b>WA0002</b>	<b>1.9</b>	<b>\$373</b>				<b>\$373</b>	<b>12.9</b>	<b>2.9</b>	<b>28%</b>
WA0003	2.2	\$454		\$28		\$370	12.4	3.0	32%
WA0004	2.7	\$451		\$244		\$421	11.8	3.6	34%
WA0006	3.6	\$474		\$239		\$414	11.6	3.6	44%
WA0007	2.6	\$343		\$166		\$319	12.2	2.7	39%
WA0008	2.8	\$446		\$180		\$402	12.0	3.4	31%
WA0009	1.9	\$355				\$355	13.1	2.7	31%
WA0010	2.4	\$586		\$194		\$432	4.6	9.9	12%
WA0011	2.5	\$340		\$167	\$2,513	\$336	12.4	2.7	33%
<b>WA0012</b>	<b>4.0</b>	<b>\$370</b>	<b>\$245</b>	<b>\$148</b>	<b>\$135</b>	<b>\$334</b>	<b>12.4</b>	<b>2.8</b>	<b>59%</b>
WA0013	3.3	\$443	\$182			\$391	12.8	3.1	40%
<b>WA0014</b>	<b>3.9</b>	<b>\$350</b>	<b>\$250</b>			<b>\$316</b>	<b>12.4</b>	<b>2.6</b>	<b>51%</b>
WA0015	2.4	\$531				\$531	13.5	4.0	40%
<b>WA0016</b>	<b>3.4</b>	<b>\$348</b>				<b>\$348</b>	<b>12.9</b>	<b>2.7</b>	<b>48%</b>
WA0017	3.6	\$513	\$235	\$183		\$444	11.7	3.9	34%
WA0018	1.7	\$440		\$212		\$436	12.9	3.4	26%
WA0019	2.2	\$567		\$194		\$525	12.1	4.4	44%
WA0020	2.3	\$459	\$193			\$416	12.4	3.4	31%
<b>WA0021</b>	<b>2.9</b>	<b>\$417</b>		<b>\$254</b>		<b>\$403</b>	<b>12.7</b>	<b>3.2</b>	<b>42%</b>
WA0022	2.5	\$311	\$222			\$275	11.8	2.4	36%
WA0023	3.3	\$362		\$74	\$405	\$310	12.1	2.7	42%
<b>WA0024</b>	<b>3.3</b>	<b>\$365</b>	<b>\$67</b>			<b>\$344</b>	<b>13.5</b>	<b>2.6</b>	<b>43%</b>
WA0025	1.6	\$457				\$457	12.9	3.6	28%
WA0026	1.4	\$426		\$318		\$424	12.4	3.5	28%
WA0027	2.3	\$398		\$174	\$1,473	\$357	11.4	3.2	34%
<b>WA0028</b>	<b>1.8</b>	<b>\$380</b>		<b>\$240</b>		<b>\$364</b>	<b>12.7</b>	<b>2.9</b>	<b>30%</b>
WA0029	2.9	\$384			\$372	\$384	12.5	3.1	45%
WA0030	3.1	\$476			\$788	\$478	12.9	3.7	58%
<b>Average</b>	<b>2.6</b>	<b>\$421</b>	<b>\$199</b>	<b>\$193</b>	<b>\$948</b>	<b>\$391</b>	<b>12.2</b>	<b>3.4</b>	<b>37%</b>
<b>Top 25%*</b>	<b>3.0</b>	<b>\$372</b>	<b>\$187</b>	<b>\$214</b>	<b>\$135</b>	<b>\$355</b>	<b>12.8</b>	<b>2.8</b>	<b>43%</b>

\* The top 25% are bold and italicised

**Table A4** Variable costs

Farm number	AI and herd test	Animal health	Calf rearing	Shed power	Dairy supplies	Total herd and shed costs	Fertiliser	Irrigation	Hay and silage making
	\$/ kg MS	\$/ kg MS	\$/ kg MS	\$/ kg MS	\$/ kg MS	\$/ kg MS	\$/ kg MS	\$/ kg MS	\$/ kg MS
WA0001	\$0.14	\$0.07	\$0.01	\$0.17	\$0.09	\$0.48	\$0.72	\$0.00	\$0.04
<b>WA0002</b>	<b>\$0.32</b>	<b>\$0.08</b>	<b>\$0.00</b>	<b>\$0.12</b>	<b>\$0.22</b>	<b>\$0.74</b>	<b>\$0.45</b>	<b>\$0.00</b>	<b>\$0.15</b>
WA0003	\$0.10	\$0.06	\$0.01	\$0.17	\$0.06	\$0.40	\$0.66	\$0.00	\$0.05
WA0004	\$0.08	\$0.05	\$0.00	\$0.10	\$0.08	\$0.31	\$0.35	\$0.00	\$0.02
WA0006	\$0.13	\$0.19	\$0.00	\$0.06	\$0.18	\$0.56	\$0.81	\$0.38	\$0.29
WA0007	\$0.01	\$0.17	\$0.01	\$0.14	\$0.16	\$0.48	\$0.51	\$0.00	\$0.13
WA0008	\$0.15	\$0.13	\$0.00	\$0.07	\$0.09	\$0.45	\$0.39	\$0.17	\$0.32
WA0009	\$0.07	\$0.19	\$0.02	\$0.16	\$0.14	\$0.59	\$0.43	\$0.00	\$0.22
WA0010	\$0.07	\$0.06	\$0.00	\$0.09	\$0.34	\$0.55	\$0.36	\$0.27	\$0.08
WA0011	\$0.08	\$0.19	\$0.00	\$0.12	\$0.09	\$0.48	\$0.62	\$0.00	\$0.33
<b>WA0012</b>	<b>\$0.08</b>	<b>\$0.16</b>	<b>\$0.01</b>	<b>\$0.12</b>	<b>\$0.14</b>	<b>\$0.50</b>	<b>\$0.56</b>	<b>\$0.00</b>	<b>\$0.00</b>
WA0013	\$0.10	\$0.02	\$0.06	\$0.13	\$0.04	\$0.35	\$0.51	\$0.23	\$0.03
<b>WA0014</b>	<b>\$0.02</b>	<b>\$0.15</b>	<b>\$0.00</b>	<b>\$0.13</b>	<b>\$0.06</b>	<b>\$0.35</b>	<b>\$0.69</b>	<b>\$0.00</b>	<b>\$0.25</b>
WA0015	\$0.05	\$0.04	\$0.00	\$0.14	\$0.10	\$0.33	\$0.85	\$0.00	\$0.08
<b>WA0016</b>	<b>\$0.14</b>	<b>\$0.18</b>	<b>\$0.05</b>	<b>\$0.17</b>	<b>\$0.19</b>	<b>\$0.73</b>	<b>\$0.75</b>	<b>\$0.00</b>	<b>\$0.07</b>
WA0017	\$0.23	\$0.20	\$0.05	\$0.13	\$0.10	\$0.70	\$0.41	\$0.00	\$0.12
WA0018	\$0.07	\$0.12	\$0.07	\$0.13	\$0.08	\$0.46	\$0.77	\$0.00	\$0.07
WA0019	\$0.15	\$0.12	\$0.01	\$0.15	\$0.02	\$0.46	\$0.13	\$0.00	\$0.34
WA0020	\$0.16	\$0.07	\$0.01	\$0.16	\$0.14	\$0.54	\$0.72	\$0.49	\$0.15
<b>WA0021</b>	<b>\$0.14</b>	<b>\$0.09</b>	<b>\$0.00</b>	<b>\$0.09</b>	<b>\$0.17</b>	<b>\$0.48</b>	<b>\$0.52</b>	<b>\$0.22</b>	<b>\$0.20</b>
WA0022	\$0.00	\$0.06	\$0.00	\$0.22	\$0.42	\$0.69	\$0.39	\$0.00	\$0.04
WA0023	\$0.09	\$0.15	\$0.03	\$0.18	\$0.28	\$0.74	\$0.74	\$0.02	\$0.39
<b>WA0024</b>	<b>\$0.08</b>	<b>\$0.12</b>	<b>\$0.00</b>	<b>\$0.14</b>	<b>\$0.09</b>	<b>\$0.44</b>	<b>\$0.60</b>	<b>\$0.18</b>	<b>\$0.25</b>
WA0025	\$0.11	\$0.05	\$0.00	\$0.10	\$0.05	\$0.31	\$0.80	\$0.19	\$0.50
WA0026	\$0.11	\$0.13	\$0.00	\$0.07	\$0.04	\$0.36	\$0.60	\$0.04	\$0.69
WA0027	\$0.11	\$0.24	\$0.02	\$0.14	\$0.15	\$0.66	\$0.65	\$0.20	\$0.20
<b>WA0028</b>	<b>\$0.16</b>	<b>\$0.14</b>	<b>\$0.00</b>	<b>\$0.09</b>	<b>\$0.11</b>	<b>\$0.49</b>	<b>\$0.45</b>	<b>\$0.00</b>	<b>\$0.04</b>
WA0029	\$0.13	\$0.31	\$0.00	\$0.20	\$0.14	\$0.78	\$0.41	\$0.29	\$0.05
WA0030	\$0.08	\$0.10	\$0.00	\$0.11	\$0.05	\$0.33	\$0.54	\$0.14	\$0.92
<b>Average</b>	<b>\$0.109</b>	<b>\$0.126</b>	<b>\$0.012</b>	<b>\$0.131</b>	<b>\$0.132</b>	<b>\$0.509</b>	<b>\$0.565</b>	<b>\$0.097</b>	<b>\$0.207</b>
<b>Top 25%*</b>	<b>\$0.134</b>	<b>\$0.131</b>	<b>\$0.008</b>	<b>\$0.122</b>	<b>\$0.138</b>	<b>\$0.534</b>	<b>\$0.575</b>	<b>\$0.057</b>	<b>\$0.137</b>

\* The top 25% are bold and italicised



**Table A4** Variable costs (continued)

Farm number	Fuel and oil	Pasture improvement/cropping	Other feed costs	Fodder purchases	Grain/concentrates/other	Agistment costs	Total feed costs	Total variable costs
	\$/ kg MS	\$/ kg MS	\$/ kg MS	\$/ kg MS	\$/ kg MS	\$/ kg MS	\$/ kg MS	\$/ kg MS
WA0001	\$0.23	\$0.12	\$0.19	\$0.02	\$1.67	\$0.00	\$3.00	\$3.48
<b>WA0002</b>	<b>\$0.14</b>	<b>\$0.03</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$1.48</b>	<b>\$0.00</b>	<b>\$2.25</b>	<b>\$2.98</b>
WA0003	\$0.40	\$0.05	\$0.00	\$0.03	\$1.81	\$0.00	\$2.98	\$3.38
WA0004	\$0.10	\$0.10	\$0.00	\$0.20	\$2.04	\$0.10	\$2.91	\$3.22
WA0006	\$0.11	\$0.09	\$0.00	\$0.38	\$2.20	\$0.00	\$4.27	\$4.83
WA0007	\$0.15	\$0.15	\$0.04	\$0.15	\$2.18	\$0.00	\$3.31	\$3.79
WA0008	\$0.07	\$0.10	\$0.00	\$0.15	\$1.64	\$0.01	\$2.86	\$3.31
WA0009	\$0.10	\$0.26	\$0.00	\$0.00	\$1.60	\$0.00	\$2.60	\$3.19
WA0010	\$0.08	\$0.20	\$0.00	\$0.32	\$1.50	\$0.01	\$2.81	\$3.36
WA0011	\$0.21	\$0.24	\$0.02	\$0.03	\$1.49	\$0.00	\$2.94	\$3.42
<b>WA0012</b>	<b>\$0.14</b>	<b>\$0.20</b>	<b>\$0.00</b>	<b>\$0.39</b>	<b>\$2.02</b>	<b>\$0.00</b>	<b>\$3.32</b>	<b>\$3.82</b>
WA0013	\$0.13	\$0.15	\$0.00	\$0.19	\$1.83	\$0.01	\$3.08	\$3.43
<b>WA0014</b>	<b>\$0.19</b>	<b>\$0.18</b>	<b>\$0.09</b>	<b>\$0.54</b>	<b>\$1.50</b>	<b>\$0.00</b>	<b>\$3.45</b>	<b>\$3.80</b>
WA0015	\$0.17	\$0.15	\$0.00	\$0.00	\$2.57	\$0.00	\$3.82	\$4.15
<b>WA0016</b>	<b>\$0.22</b>	<b>\$0.15</b>	<b>\$0.25</b>	<b>\$0.00</b>	<b>\$2.27</b>	<b>\$0.06</b>	<b>\$3.76</b>	<b>\$4.49</b>
WA0017	\$0.07	\$0.14	\$0.02	\$0.27	\$2.30	\$0.00	\$3.33	\$4.04
WA0018	\$0.08	\$0.12	\$0.11	\$0.05	\$1.30	\$0.00	\$2.49	\$2.96
WA0019	\$0.21	\$0.04	\$0.00	\$0.11	\$2.46	\$0.50	\$3.78	\$4.23
WA0020	\$0.24	\$0.19	\$0.03	\$0.19	\$1.93	\$0.00	\$3.94	\$4.48
<b>WA0021</b>	<b>\$0.08</b>	<b>\$0.08</b>	<b>\$0.11</b>	<b>\$0.11</b>	<b>\$1.89</b>	<b>\$0.00</b>	<b>\$3.21</b>	<b>\$3.69</b>
WA0022	\$0.16	\$0.10	\$0.43	\$0.56	\$1.22	\$0.00	\$2.91	\$3.60
WA0023	\$0.19	\$0.14	\$0.08	\$0.12	\$1.81	\$0.00	\$3.49	\$4.23
<b>WA0024</b>	<b>\$0.08</b>	<b>\$0.12</b>	<b>\$0.07</b>	<b>\$0.03</b>	<b>\$1.88</b>	<b>\$0.02</b>	<b>\$3.22</b>	<b>\$3.65</b>
WA0025	\$0.03	\$0.35	\$0.73	\$0.00	\$1.57	\$0.00	\$4.16	\$4.47
WA0026	\$0.07	\$0.23	\$0.78	\$0.04	\$1.38	\$0.00	\$3.83	\$4.18
WA0027	\$0.14	\$0.49	\$0.01	\$0.18	\$1.41	\$0.09	\$3.37	\$4.03
<b>WA0028</b>	<b>\$0.10</b>	<b>\$0.05</b>	<b>\$0.02</b>	<b>\$0.12</b>	<b>\$1.50</b>	<b>\$0.04</b>	<b>\$2.32</b>	<b>\$2.82</b>
WA0029	\$0.16	\$0.20	\$0.12	\$0.00	\$2.38	\$0.00	\$3.62	\$4.40
WA0030	\$0.22	\$0.57	\$0.09	\$0.00	\$2.49	\$0.02	\$4.99	\$5.33
<b>Average</b>	<b>\$0.15</b>	<b>\$0.17</b>	<b>\$0.11</b>	<b>\$0.14</b>	<b>\$1.84</b>	<b>\$0.03</b>	<b>\$3.31</b>	<b>\$3.82</b>
<b>Top 25%*</b>	<b>\$0.13</b>	<b>\$0.12</b>	<b>\$0.08</b>	<b>\$0.17</b>	<b>\$1.79</b>	<b>\$0.02</b>	<b>\$3.08</b>	<b>\$3.61</b>

\* The top 25% are bold and italicised

**Table A5** Overhead costs

Farm number	Rates	Registration and insurance	Farm insurance	Repairs and maintenance	Bank charges	Other overheads	Employed Labour	Total cash overheads	Depreciation	Imputed owner/operator and family labour	Total overheads
	\$/ kg MS	\$/ kg MS	\$/ kg MS	\$/ kg MS	\$/ kg MS	\$/ kg MS	\$/ kg MS	\$/ kg MS	\$/ kg MS	\$/ kg MS	\$/ kg MS
WA0001	\$0.03	\$0.03	\$0.07	\$0.24	\$0.03	\$0.08	\$0.24	\$0.73	\$0.48	\$0.61	\$1.82
<b>WA0002</b>	<b>\$0.03</b>	<b>\$0.01</b>	<b>\$0.09</b>	<b>\$0.33</b>	<b>\$0.00</b>	<b>\$0.13</b>	<b>\$0.76</b>	<b>\$1.35</b>	<b>\$0.26</b>	<b>\$0.24</b>	<b>\$1.85</b>
WA0003	\$0.04	\$0.03	\$0.00	\$0.47	\$0.01	\$0.08	\$0.53	\$1.18	\$0.27	\$0.76	\$2.21
WA0004	\$0.07	\$0.02	\$0.03	\$0.48	\$0.01	\$0.06	\$0.77	\$1.43	\$0.19	\$0.41	\$2.03
WA0006	\$0.02	\$0.01	\$0.04	\$0.54	\$0.01	\$0.06	\$1.05	\$1.75	\$0.25	\$0.18	\$2.18
WA0007	\$0.03	\$0.01	\$0.12	\$0.48	\$0.01	\$0.21	\$0.66	\$1.51	\$0.46	\$0.67	\$2.64
WA0008	\$0.05	\$0.01	\$0.10	\$0.57	\$0.01	\$0.21	\$0.50	\$1.44	\$0.18	\$0.81	\$2.43
WA0009	\$0.12	\$0.02	\$0.14	\$0.44	\$0.00	\$0.06	\$0.72	\$1.50	\$0.25	\$0.63	\$2.38
WA0010	\$0.08	\$0.04	\$0.00	\$0.75	\$0.00	\$0.07	\$0.49	\$1.43	\$0.13	\$0.80	\$2.36
WA0011	\$0.01	\$0.03	\$0.07	\$0.63	\$0.01	\$0.12	\$0.60	\$1.47	\$0.30	\$1.11	\$2.88
<b>WA0012</b>	<b>\$0.03</b>	<b>\$0.02</b>	<b>\$0.03</b>	<b>\$0.41</b>	<b>\$0.00</b>	<b>\$0.07</b>	<b>\$1.17</b>	<b>\$1.73</b>	<b>\$0.25</b>	<b>\$0.15</b>	<b>\$2.13</b>
WA0013	\$0.06	\$0.01	\$0.06	\$0.58	\$0.00	\$0.08	\$0.70	\$1.48	\$0.27	\$0.36	\$2.11
<b>WA0014</b>	<b>\$0.02</b>	<b>\$0.02</b>	<b>\$0.07</b>	<b>\$0.38</b>	<b>\$0.02</b>	<b>\$0.12</b>	<b>\$0.45</b>	<b>\$1.08</b>	<b>\$0.35</b>	<b>\$0.29</b>	<b>\$1.72</b>
WA0015	\$0.04	\$0.02	\$0.09	\$0.64	\$0.00	\$0.06	\$0.73	\$1.57	\$0.30	\$0.54	\$2.40
<b>WA0016</b>	<b>\$0.01</b>	<b>\$0.01</b>	<b>\$0.08</b>	<b>\$0.26</b>	<b>\$0.00</b>	<b>\$0.00</b>	<b>\$1.41</b>	<b>\$1.77</b>	<b>\$0.35</b>	<b>\$0.06</b>	<b>\$2.18</b>
WA0017	\$0.04	\$0.01	\$0.07	\$0.63	\$0.01	\$0.15	\$0.34	\$1.26	\$0.12	\$0.98	\$2.37
WA0018	\$0.06	\$0.03	\$0.06	\$0.57	\$0.01	\$0.08	\$0.39	\$1.21	\$0.33	\$1.13	\$2.67
WA0019	\$0.02	\$0.01	\$0.14	\$0.57	\$0.02	\$0.11	\$0.46	\$1.33	\$0.18	\$0.83	\$2.33
WA0020	\$0.06	\$0.08	\$0.08	\$0.63	\$0.00	\$0.14	\$0.45	\$1.45	\$0.08	\$1.15	\$2.69
<b>WA0021</b>	<b>\$0.04</b>	<b>\$0.03</b>	<b>\$0.06</b>	<b>\$0.20</b>	<b>\$0.00</b>	<b>\$0.10</b>	<b>\$0.49</b>	<b>\$0.93</b>	<b>\$0.13</b>	<b>\$0.54</b>	<b>\$1.60</b>
WA0022	\$0.03	\$0.07	\$0.15	\$0.53	\$0.01	\$0.13	\$1.36	\$2.28	\$0.46	\$0.56	\$3.30
WA0023	\$0.04	\$0.07	\$0.15	\$0.43	\$0.00	\$0.11	\$1.02	\$1.81	\$0.32	\$0.69	\$2.82
<b>WA0024</b>	<b>\$0.06</b>	<b>\$0.02</b>	<b>\$0.05</b>	<b>\$0.47</b>	<b>\$0.01</b>	<b>\$0.13</b>	<b>\$0.51</b>	<b>\$1.26</b>	<b>\$0.29</b>	<b>\$0.53</b>	<b>\$2.07</b>
WA0025	\$0.01	\$0.00	\$0.00	\$0.31	\$0.08	\$0.35	\$0.66	\$1.42	\$0.29	\$0.06	\$1.77
WA0026	\$0.01	\$0.00	\$0.00	\$0.20	\$0.08	\$0.31	\$0.94	\$1.56	\$0.31	\$0.12	\$1.99
WA0027	\$0.02	\$0.02	\$0.06	\$0.58	\$0.00	\$0.12	\$1.16	\$1.96	\$0.14	\$0.18	\$2.28
<b>WA0028</b>	<b>\$0.04</b>	<b>\$0.00</b>	<b>\$0.06</b>	<b>\$0.34</b>	<b>\$0.00</b>	<b>\$0.04</b>	<b>\$0.83</b>	<b>\$1.31</b>	<b>\$0.15</b>	<b>\$0.29</b>	<b>\$1.75</b>
WA0029	\$0.01	\$0.01	\$0.11	\$0.55	\$0.02	\$0.10	\$1.16	\$1.95	\$0.45	\$0.26	\$2.66
WA0030	\$0.03	\$0.02	\$0.07	\$0.65	\$0.00	\$0.10	\$0.57	\$1.45	\$0.11	\$0.47	\$2.03
<b>Average</b>	<b>\$0.04</b>	<b>\$0.02</b>	<b>\$0.07</b>	<b>\$0.48</b>	<b>\$0.01</b>	<b>\$0.12</b>	<b>\$0.73</b>	<b>\$1.47</b>	<b>\$0.26</b>	<b>\$0.53</b>	<b>\$2.26</b>
<b>Top 25%*</b>	<b>\$0.03</b>	<b>\$0.02</b>	<b>\$0.06</b>	<b>\$0.34</b>	<b>\$0.01</b>	<b>\$0.08</b>	<b>\$0.80</b>	<b>\$1.35</b>	<b>\$0.25</b>	<b>\$0.30</b>	<b>\$1.90</b>

\* The top 25% are bold and italicised

**Table A6** Variable costs

Farm number	AI and herd test	Animal health	Calf rearing	Shed power	Dairy supplies	Total herd and shed costs	Fertiliser	Irrigation	Hay and silage making
	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs
WA0001	2.6%	1.3%	0.2%	3.2%	1.8%	9.1%	13.6%	0.0%	0.8%
<b>WA0002</b>	<b>6.6%</b>	<b>1.7%</b>	<b>0.0%</b>	<b>2.5%</b>	<b>4.5%</b>	<b>15.2%</b>	<b>9.3%</b>	<b>0.0%</b>	<b>3.2%</b>
WA0003	1.7%	1.1%	0.1%	3.0%	1.1%	7.1%	11.7%	0.0%	0.8%
WA0004	1.6%	0.9%	0.0%	2.0%	1.5%	6.0%	6.6%	0.0%	0.3%
WA0006	1.8%	2.8%	0.0%	0.9%	2.5%	8.0%	11.6%	5.5%	4.1%
WA0007	0.2%	2.6%	0.2%	2.1%	2.4%	7.5%	8.0%	0.0%	2.0%
WA0008	2.6%	2.3%	0.0%	1.3%	1.6%	7.8%	6.8%	2.9%	5.6%
WA0009	1.3%	3.3%	0.4%	2.9%	2.6%	10.6%	7.7%	0.0%	3.9%
WA0010	1.2%	1.0%	0.0%	1.5%	6.0%	9.7%	6.2%	4.7%	1.4%
WA0011	1.3%	3.0%	0.0%	1.8%	1.5%	7.7%	9.8%	0.0%	5.2%
<b>WA0012</b>	<b>1.3%</b>	<b>2.7%</b>	<b>0.1%</b>	<b>2.0%</b>	<b>2.3%</b>	<b>8.4%</b>	<b>9.5%</b>	<b>0.0%</b>	<b>0.0%</b>
WA0013	1.7%	0.4%	1.0%	2.3%	0.8%	6.3%	9.1%	4.1%	0.6%
<b>WA0014</b>	<b>0.4%</b>	<b>2.7%</b>	<b>0.0%</b>	<b>2.3%</b>	<b>1.0%</b>	<b>6.4%</b>	<b>12.5%</b>	<b>0.0%</b>	<b>4.6%</b>
WA0015	0.7%	0.6%	0.0%	2.2%	1.5%	5.0%	13.0%	0.0%	1.2%
<b>WA0016</b>	<b>2.1%</b>	<b>2.7%</b>	<b>0.8%</b>	<b>2.5%</b>	<b>2.8%</b>	<b>10.9%</b>	<b>11.3%</b>	<b>0.0%</b>	<b>1.1%</b>
WA0017	3.6%	3.1%	0.8%	2.0%	1.5%	11.0%	6.5%	0.0%	1.9%
WA0018	1.2%	2.2%	1.2%	2.2%	1.4%	8.2%	13.6%	0.0%	1.2%
WA0019	2.3%	1.8%	0.2%	2.3%	0.3%	7.0%	2.0%	0.0%	5.1%
WA0020	2.2%	1.0%	0.1%	2.2%	2.0%	7.6%	10.0%	6.9%	2.1%
<b>WA0021</b>	<b>2.6%</b>	<b>1.6%</b>	<b>0.0%</b>	<b>1.7%</b>	<b>3.2%</b>	<b>9.2%</b>	<b>9.8%</b>	<b>4.2%</b>	<b>3.7%</b>
WA0022	0.0%	0.9%	0.0%	3.2%	6.0%	10.0%	5.7%	0.0%	0.6%
WA0023	1.3%	2.2%	0.4%	2.6%	4.0%	10.5%	10.5%	0.2%	5.5%
<b>WA0024</b>	<b>1.5%</b>	<b>2.1%</b>	<b>0.0%</b>	<b>2.4%</b>	<b>1.6%</b>	<b>7.6%</b>	<b>10.5%</b>	<b>3.1%</b>	<b>4.4%</b>
WA0025	1.7%	0.8%	0.0%	1.6%	0.8%	5.0%	12.8%	3.0%	8.0%
WA0026	1.8%	2.1%	0.0%	1.2%	0.7%	5.8%	9.7%	0.7%	11.2%
WA0027	1.7%	3.8%	0.4%	2.2%	2.4%	10.5%	10.3%	3.1%	3.1%
<b>WA0028</b>	<b>3.5%</b>	<b>3.1%</b>	<b>0.0%</b>	<b>1.9%</b>	<b>2.4%</b>	<b>10.8%</b>	<b>9.9%</b>	<b>0.0%</b>	<b>0.9%</b>
WA0029	1.8%	4.4%	0.0%	2.9%	2.0%	11.0%	5.9%	4.1%	0.8%
WA0030	1.1%	1.3%	0.0%	1.5%	0.6%	4.5%	7.3%	1.9%	12.6%
<b>Average</b>	<b>1.85%</b>	<b>2.06%</b>	<b>0.20%</b>	<b>2.15%</b>	<b>2.17%</b>	<b>8.42%</b>	<b>9.35%</b>	<b>1.53%</b>	<b>3.30%</b>
<b>Top 25%*</b>	<b>2.56%</b>	<b>2.37%</b>	<b>0.13%</b>	<b>2.19%</b>	<b>2.54%</b>	<b>9.80%</b>	<b>10.39%</b>	<b>1.04%</b>	<b>2.53%</b>

\* The top 25% are bold and italicised



**Table A6** Variable costs (continued)

Farm number	Fuel and oil	Pasture improvement/cropping	Other feed costs	Fodder purchases	Grain/concentrates/other	Agistment costs	Total feed costs	Total variable costs
	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs
WA0001	4.4%	2.2%	3.6%	0.4%	31.5%	0.0%	56.5%	65.6%
<b>WA0002</b>	<b>2.8%</b>	<b>0.5%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>30.7%</b>	<b>0.0%</b>	<b>46.5%</b>	<b>61.8%</b>
WA0003	7.1%	0.8%	0.0%	0.5%	32.4%	0.0%	53.3%	60.4%
WA0004	2.0%	1.9%	0.0%	3.9%	38.8%	1.9%	55.3%	61.3%
WA0006	1.6%	1.3%	0.0%	5.5%	31.4%	0.0%	60.9%	68.9%
WA0007	2.3%	2.4%	0.6%	2.3%	33.9%	0.0%	51.5%	59.0%
WA0008	1.2%	1.7%	0.0%	2.7%	28.6%	0.2%	49.8%	57.6%
WA0009	1.7%	4.7%	0.0%	0.0%	28.7%	0.0%	46.7%	57.3%
WA0010	1.4%	3.5%	0.0%	5.6%	26.1%	0.2%	49.1%	58.8%
WA0011	3.4%	3.7%	0.4%	0.4%	23.7%	0.0%	46.6%	54.3%
<b>WA0012</b>	<b>2.4%</b>	<b>3.3%</b>	<b>0.0%</b>	<b>6.6%</b>	<b>33.9%</b>	<b>0.0%</b>	<b>55.8%</b>	<b>64.2%</b>
WA0013	2.3%	2.8%	0.0%	3.4%	33.1%	0.2%	55.7%	62.0%
<b>WA0014</b>	<b>3.4%</b>	<b>3.3%</b>	<b>1.6%</b>	<b>9.9%</b>	<b>27.3%</b>	<b>0.0%</b>	<b>62.5%</b>	<b>68.9%</b>
WA0015	2.6%	2.2%	0.0%	0.0%	39.3%	0.0%	58.3%	63.3%
<b>WA0016</b>	<b>3.2%</b>	<b>2.2%</b>	<b>3.8%</b>	<b>0.0%</b>	<b>34.0%</b>	<b>0.8%</b>	<b>56.4%</b>	<b>67.4%</b>
WA0017	1.1%	2.1%	0.3%	4.2%	35.9%	0.0%	52.1%	63.0%
WA0018	1.4%	2.1%	2.0%	0.8%	23.2%	0.0%	44.3%	52.6%
WA0019	3.2%	0.6%	0.0%	1.6%	37.5%	7.6%	57.5%	64.5%
WA0020	3.3%	2.7%	0.4%	2.7%	26.9%	0.0%	55.0%	62.5%
<b>WA0021</b>	<b>1.6%</b>	<b>1.6%</b>	<b>2.2%</b>	<b>2.1%</b>	<b>35.7%</b>	<b>0.0%</b>	<b>60.6%</b>	<b>69.8%</b>
WA0022	2.3%	1.5%	6.3%	8.1%	17.7%	0.0%	42.1%	52.2%
WA0023	2.8%	2.0%	1.2%	1.7%	25.7%	0.0%	49.5%	60.0%
<b>WA0024</b>	<b>1.3%</b>	<b>2.1%</b>	<b>1.2%</b>	<b>0.5%</b>	<b>32.8%</b>	<b>0.3%</b>	<b>56.2%</b>	<b>63.8%</b>
WA0025	0.6%	5.6%	11.6%	0.0%	25.1%	0.0%	66.6%	71.6%
WA0026	1.1%	3.7%	12.6%	0.7%	22.4%	0.0%	62.0%	67.8%
WA0027	2.2%	7.8%	0.1%	2.9%	22.4%	1.4%	53.4%	63.9%
<b>WA0028</b>	<b>2.1%</b>	<b>1.1%</b>	<b>0.5%</b>	<b>2.6%</b>	<b>32.9%</b>	<b>0.9%</b>	<b>50.8%</b>	<b>61.7%</b>
WA0029	2.3%	2.8%	1.7%	0.0%	33.8%	0.0%	51.3%	62.3%
WA0030	2.9%	7.8%	1.2%	0.0%	33.9%	0.3%	67.9%	72.4%
<b>Average</b>	<b>2.4%</b>	<b>2.8%</b>	<b>1.8%</b>	<b>2.4%</b>	<b>30.3%</b>	<b>0.5%</b>	<b>54.3%</b>	<b>62.7%</b>
<b>Top 25%*</b>	<b>2.4%</b>	<b>2.0%</b>	<b>1.3%</b>	<b>3.1%</b>	<b>32.5%</b>	<b>0.3%</b>	<b>55.6%</b>	<b>65.4%</b>

\* The top 25% are bold and italicised

**Table A7** Overhead costs

Farm number	Rates	Registration and insurance	Farm insurance	Repairs and maintenance	Bank charges	Other overheads	Employed labour	Total cash overheads	Depreciation	Imputed owner/operator and family labour	Total overheads
	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs
WA0001	0.5%	0.6%	1.4%	4.5%	0.6%	1.6%	4.6%	13.7%	9.1%	11.6%	34.4%
<b>WA0002</b>	<b>0.5%</b>	<b>0.3%</b>	<b>1.8%</b>	<b>6.8%</b>	<b>0.1%</b>	<b>2.7%</b>	<b>15.7%</b>	<b>27.9%</b>	<b>5.3%</b>	<b>5.0%</b>	<b>38.2%</b>
WA0003	0.8%	0.5%	0.1%	8.5%	0.2%	1.5%	9.5%	21.1%	4.9%	13.6%	39.6%
WA0004	1.2%	0.4%	0.6%	9.1%	0.1%	1.1%	14.6%	27.2%	3.6%	7.9%	38.7%
WA0006	0.4%	0.2%	0.6%	7.8%	0.1%	0.9%	15.0%	24.9%	3.6%	2.6%	31.1%
WA0007	0.5%	0.2%	1.8%	7.4%	0.1%	3.2%	10.3%	23.5%	7.1%	10.5%	41.0%
WA0008	0.9%	0.2%	1.7%	9.9%	0.1%	3.6%	8.7%	25.1%	3.2%	14.1%	42.4%
WA0009	2.1%	0.3%	2.6%	7.9%	0.1%	1.1%	13.0%	27.0%	4.4%	11.3%	42.7%
WA0010	1.4%	0.7%	0.0%	13.1%	0.0%	1.3%	8.5%	25.0%	2.2%	14.0%	41.2%
WA0011	0.1%	0.4%	1.1%	10.1%	0.2%	1.9%	9.6%	23.3%	4.7%	17.6%	45.7%
<b>WA0012</b>	<b>0.5%</b>	<b>0.3%</b>	<b>0.6%</b>	<b>6.9%</b>	<b>0.1%</b>	<b>1.2%</b>	<b>19.6%</b>	<b>29.0%</b>	<b>4.2%</b>	<b>2.6%</b>	<b>35.8%</b>
WA0013	1.0%	0.2%	1.0%	10.4%	0.0%	1.4%	12.6%	26.8%	4.9%	6.4%	38.0%
<b>WA0014</b>	<b>0.4%</b>	<b>0.4%</b>	<b>1.2%</b>	<b>6.9%</b>	<b>0.3%</b>	<b>2.2%</b>	<b>8.2%</b>	<b>19.5%</b>	<b>6.3%</b>	<b>5.2%</b>	<b>31.1%</b>
WA0015	0.5%	0.3%	1.3%	9.7%	0.1%	0.9%	11.1%	24.0%	4.5%	8.2%	36.7%
<b>WA0016</b>	<b>0.2%</b>	<b>0.2%</b>	<b>1.3%</b>	<b>3.8%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>21.1%</b>	<b>26.5%</b>	<b>5.3%</b>	<b>0.8%</b>	<b>32.6%</b>
WA0017	0.7%	0.2%	1.1%	9.9%	0.1%	2.4%	5.4%	19.7%	1.9%	15.4%	37.0%
WA0018	1.0%	0.6%	1.1%	10.2%	0.3%	1.4%	7.0%	21.5%	5.8%	20.2%	47.4%
WA0019	0.4%	0.2%	2.1%	8.6%	0.2%	1.7%	7.0%	20.3%	2.7%	12.6%	35.5%
WA0020	0.8%	1.1%	1.2%	8.8%	0.0%	2.0%	6.3%	20.3%	1.1%	16.1%	37.5%
<b>WA0021</b>	<b>0.7%</b>	<b>0.5%</b>	<b>1.2%</b>	<b>3.8%</b>	<b>0.1%</b>	<b>1.9%</b>	<b>9.3%</b>	<b>17.5%</b>	<b>2.5%</b>	<b>10.1%</b>	<b>30.2%</b>
WA0022	0.5%	1.0%	2.2%	7.6%	0.1%	1.8%	19.7%	33.0%	6.7%	8.1%	47.8%
WA0023	0.5%	1.0%	2.1%	6.1%	0.0%	1.5%	14.5%	25.7%	4.5%	9.8%	40.0%
<b>WA0024</b>	<b>1.0%</b>	<b>0.4%</b>	<b>0.9%</b>	<b>8.3%</b>	<b>0.1%</b>	<b>2.3%</b>	<b>9.0%</b>	<b>21.9%</b>	<b>5.0%</b>	<b>9.3%</b>	<b>36.2%</b>
WA0025	0.2%	0.0%	0.0%	5.0%	1.2%	5.6%	10.6%	22.8%	4.7%	0.9%	28.4%
WA0026	0.2%	0.0%	0.0%	3.3%	1.3%	5.1%	15.3%	25.3%	5.1%	1.9%	32.2%
WA0027	0.4%	0.4%	0.9%	9.3%	0.0%	1.8%	18.3%	31.1%	2.3%	2.8%	36.1%
<b>WA0028</b>	<b>1.0%</b>	<b>0.1%</b>	<b>1.2%</b>	<b>7.4%</b>	<b>0.0%</b>	<b>1.0%</b>	<b>18.1%</b>	<b>28.7%</b>	<b>3.3%</b>	<b>6.3%</b>	<b>38.3%</b>
WA0029	0.2%	0.1%	1.5%	7.8%	0.3%	1.4%	16.4%	27.6%	6.4%	3.7%	37.7%
WA0030	0.4%	0.3%	1.0%	8.8%	0.1%	1.4%	7.7%	19.7%	1.5%	6.4%	27.6%
<b>Average</b>	<b>0.66%</b>	<b>0.38%</b>	<b>1.16%</b>	<b>7.84%</b>	<b>0.21%</b>	<b>1.93%</b>	<b>11.95%</b>	<b>24.12%</b>	<b>4.37%</b>	<b>8.79%</b>	<b>37.29%</b>
<b>Top 25%*</b>	<b>0.62%</b>	<b>0.30%</b>	<b>1.17%</b>	<b>6.27%</b>	<b>0.10%</b>	<b>1.59%</b>	<b>14.41%</b>	<b>24.45%</b>	<b>4.57%</b>	<b>5.63%</b>	<b>34.65%</b>

\* The Top 25% are bold and italicised

**Table A8** Capital structure

	FARM ASSETS				OTHER FARM ASSETS (PER USABLE HECTARE)				Total assets
	Land value	Land value	Permanent water value	Permanent water value	Plant and equipment	Livestock	Hay and grain	Other assets	
	\$/ha	\$/cow	\$/ha	\$/cow	\$/ha	\$/ha	\$/ha	\$/ha	\$/ha
Average	\$14,074	\$9,972	\$406	\$259	\$1,244	\$1,538	\$73	\$41	\$12,190
Top 25%*	\$13,719	\$9,567	\$0	\$0	\$1,452	\$1,755	\$100	\$120	\$13,677

	LIABILITIES		ASSETS	
	Liabilities per usable hectare	Liabilities per milking cow	Equity per usable hectare	Average equity
	\$/ha	\$/cow	\$/ha	%
Average	\$2,496	\$2,798	\$9,694	78%
Top 25%*	\$2,362	\$2,353	\$11,315	81%



## Appendix B: Glossary of terms

### All other income

Income to the farm from all sources except milk. Includes livestock trading profit, feed inventory change, dividends, interest payments received, rent from cottages, rebates and grants.

### Annual hours

Total hours worked by a person during the given twelve month period.

### Appreciation

An increase in the value of an asset in the market place. Often only applicable to land value.

### Asset

Anything managed by the farm, whether it is owned or not. Assets include land and buildings, plant and machinery, fixtures and fittings, trading stock, investments, debtors, and cash.

### Break-even price required

Cost of production minus income only sourced from the main enterprise output. Allows for direct comparison with price received of main output.

### Cash overheads

All fixed costs that have a cash cost to the business. Includes all overhead costs except imputed people costs and depreciation.

### Cost of production

Variable costs plus overhead costs. Usually expressed in terms of the main enterprise output ie kilograms of milk solids.

### Cost structure

Variable costs as a percentage of total costs, where total costs equals variable costs plus overhead costs.

### Debt servicing ratio

Interest and lease costs as a percentage of gross farm income.

### Depreciation

Decrease in value over time of capital asset, usually as a result of using the asset. Depreciation is not cash, but reduces the book value of the asset and is therefore a cost.

### Earnings before interest and tax (EBIT)

Gross income minus total variable costs and total overhead costs.

### EBIT %

The ratio of EBIT compared to gross income. Indicates the percentage of each dollar of gross income that is retained as EBIT.

### Employed labour cost

Cash cost of any paid employee, including on-costs such as superannuation, workcover etc.

### Equity

Total assets minus total liabilities. Equal to the total value of capital invested in the farm business by the owner/operator(s).

### Equity %

Total equity as a percentage of the total assets managed. The proportion of the total assets owned by the business.

### Farm income

See gross farm income.

### Feed costs

Cost of fertiliser, irrigation (including effluent), hay and silage making, fuel and oil, pasture improvement, fodder purchases, grain/concentrates, agistment and lease costs associated with any of the above costs.

### Finance costs

Total interest plus total lease costs paid.

### Full time equivalent (FTE)

Standardised people unit. Equal to 2400 hours a year. Calculated as 50 hours a week, 48 weeks a year.

### Grazed area

Total usable area minus any area used only for fodder production during the year.

### Grazed pasture

Calculated using the energetics method. Grazed pasture is calculated as the gap between total energy required by livestock over the year and amount of energy available from other sources (hay, silage, grain and concentrates).

Total energy required by livestock is a factor of; age, weight, growth rate, pregnancy and lactation requirements, distance to shed and terrain, and number of animals.

Total energy available is the sum of energy available from all feed sources except pasture, calculated as (weight (kg) × dry matter content (DM %) × metabolisable energy (MJ/kg DM)).

### Gross farm income

Farm income including milk sales, livestock and feed trading gains and other income such as income from grants and rebates.

### Gross margin

Gross income minus total variable costs.

### Herd costs

Cost of AI and herd tests, animal health and calf rearing.

### Imputed

An estimated amount, introduced into economic management analysis to allow reasonable comparisons between years and between other businesses.

### Imputed labour cost

An allocated allowance for cost of owner/operator, family and sharefarmer time in the business, taken as the greater of \$400 per cow less employed labour or \$25 per hour.

**Liability**

Money owed to someone else, e.g. family or an institution such as a bank

**Metabolisable energy**

Energy available to livestock in feed, expressed in megajoules per kilogram of dry matter (MJ/kg DM).

**Milk income**

Income through the sales of milk.

**Milking area**

Total usable area minus outblocks or run-off areas.

**Net farm income**

Previously reported as business profit

Earnings before interest and tax minus interest and lease costs. The amount of profit available for capital investment, loan principal repayments and tax.

**Number of milkers**

Total number of cows milked for at least three months.

**Other income**

Income to the farm from other farm owned assets and external sources. Includes dividends, interest payments received, rents from cottage, rebates and grants.

**Overhead costs**

All fixed costs incurred by the farm business e.g. rates, administration, depreciation, insurance, imputed labour. Note: interest, leases, capital expenditure, principal repayments and tax are not included.

**Labour cost**

Cost of the labour resource on farm. Includes both imputed and employed labour cost.

**Labour efficiency**

FTEs per cow and per kilogram of milk solid. Measures of productivity of the total labour resources in the business.

**Labour resource**

Any person who works in the business, be they the owner, family, sharefarmer or employed on a permanent, part time or contract basis.

**Livestock trading profit**

An estimate of the annual contribution to gross income by accounting for the changes in the number and value of livestock during the year. It is calculated as the trading income from sales minus purchases, plus changes in the value and number of livestock on hand at the start and end of the year, and accounting for births and deaths. An increase in livestock trading indicates there was an appreciation of livestock or an increase in livestock numbers over the year.

**Return on assets (RoA)**

Earnings before interest and tax divided by the value of total assets under management.

**Return on equity (RoE)**

Net farm income divided by the value of total equity.

**Shed costs**

Cost of shed power and dairy supplies such as filter socks, rubber ware, vacuum pump oil etc.

**Total income**

See gross farm income.

**Total usable area**

Total hectares managed minus that area of land which is of little or no value for livestock production e.g. house and shed area.

**Total water used**

Total rainfall plus average irrigation water used expressed as millimetres per hectare, where irrigation water is calculated as:  $(\text{total megalitres of water used} / \text{total usable area}) \times 100$ .

**Variable costs**

All costs that vary with the size of production in the enterprise e.g. herd, shed and feed costs.

## List of abbreviations

<b>AI</b>	Artificial insemination.	<b>kg</b>	Kilograms.
<b>BPR</b>	Break-even price required.	<b>LRWS</b>	Low Reliability Water Shares.
<b>CH<sub>4</sub></b>	Methane gas.	<b>ME</b>	Metabolisable energy (MJ/kg).
<b>CO<sub>2</sub></b>	Carbon dioxide gas.	<b>MJ</b>	Megajoules of energy.
<b>CO<sub>2</sub>-e</b>	Carbon dioxide equivalent.	<b>mm</b>	Millimetres. 1 mm is equivalent to 4 points or 1/25th of an inch of rainfall.
<b>CoP</b>	Cost of production.	<b>MS</b>	Milk solids (proteins and fats).
<b>DEDJTR</b>	Department of Economics Development, Jobs, Transport and Resources, Victoria	<b>N<sub>2</sub>O</b>	Nitrous oxide gas.
<b>DM</b>	Dry matter of feed stuffs.	<b>Q1</b>	First quartile, i.e. the value of which one quarter, or 25%, of data in that range is less than.
<b>EBIT</b>	Earnings before interest and tax.	<b>Q3</b>	Third quartile, i.e. the value of which one quarter, or 25%, of data in that range is greater than.
<b>FTE</b>	Full time equivalent.	<b>RoA</b>	Return on assets.
<b>GWP</b>	Global Warming Potential.	<b>RoE</b>	Return on equity.
<b>ha</b>	Hectares.	<b>t</b>	Tonne = 1,000 kg.
<b>hd</b>	Head of cattle.		
<b>HRWS</b>	High Reliability Water Shares.		







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