Dairy Australia
Your Levy at Work


# Dairy Farm Monitor Project

## South Australia
## annual report 2015–16

# Acknowledgements

The cooperation, patience and goodwill of the farmers who willingly supplied their farm information is gratefully acknowledged.

The project was made possible this year through the guidance and contributions of Verity Ingham from DairySA, Claire Waterman from the Department of Economic Development, Jobs, Transport and Resources, Victoria, and Helen Quinn from Dairy Australia.

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The data in this report and the report itself have been produced by Chris Scheid and Kate Nicholas, from ProAdvice, and Dan Armstrong from D-ARM Consulting in conjunction with Claire Waterman from the Victorian Department of Economic Development, Jobs, Transport and Resources.

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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
- South Australia overview
- Business confidence survey
- Greenhouse gas emissions report
- Historical analysis
- Appendices

Participants were selected for the project in order to represent a distribution of farm sizes, herd sizes and geographical locations within South Australia. The results presented in this report do not represent population averages as the participant farms were not selected using random population sampling.

The report presents visual descriptions of the data for the 2015–16 year. Data are presented for individual farms, as state averages and for the state top 25% of farms ranked by return on assets (RoA). The presented averages should not be considered averages for the population of farms in the state due to the small sample size and these farms not being randomly selected.

The top 25% of farms are presented as lighter coloured bars. Return on assets is the determinant used to identify the top 25% of producers 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, a glossary of terms and a list of standard values used.

Milk production data is presented in kilograms of milk solids (fat + protein) as farmers are paid based on milk solids production.

The report focuses on measures on a per kilogram of milk solids basis, with occasional reference to measures on a per hectare or per cow basis. The appendix tables contain the majority of financial information on a per kilogram of milk solids basis.

Percentage differences are calculated as [(new value – original value)/original value]. For example 'costs went from $80/ha to $120/ha, a 50% increase'; [{(120-80)/80} x (100/1)] = [(40/80) x 100] = 0.5 x 100 = 50%, unless otherwise stated.

The top 25% consists of four farms two from the Central and two from the South East of South Australia from 16 farms across the three dairying areas of South Australia.

Any reference to 'last year' refers to the 2014–15 Dairy Farm Monitor Project report.

Price and cost comparisons between years are nominal unless otherwise stated.

It should be noted that not all of the participants from 2014–15 are in the 2015–16 report. This year, there are three new participating farms. This is important to bear in mind when comparing data sets between years.

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

# What's new in 2015–16?

The Dairy Farm Monitor Report for 2015–16 includes a number of changes since last year's report. The most significant are:

The standard value for imputed owner-operator and family labour was revised from $25/hr to $28/hr to reflect industry rates and inflation.

The standard value for livestock used to calculate livestock trading profit and asset values was revised to reflect market rates and inflation. For example, the value of a mature cow increased from $1,100/head to $1,500/head across all participant farms.

The cost of production calculation was revised to articulate the cost of production on a cash basis, cash plus non-cash basis and also to identify the impact of inventory change on cost of production. This also now aligns with the reporting in Dairy Australia's DairyBase.

The standard values used to estimate the value of livestock and the imputed operators' allowance for labour and management are detailed in the Appendix B.

The method of estimating Australia's dairy industry greenhouse gas emissions, the national greenhouse gas inventory (NGGI), was altered to reflect new research outcomes and align with international guidelines. The global warming potential (GWP) of the main three gases was altered, and pre-farm gate emissions sources are now considered.

Keep an eye on the project website for further reports and updates on the project at agriculture.vic.gov.au/dairyfarmmonitor or www.dairyaustralia.com.au/dairyfarmmonitor

# Summary

# Summary

In 2015–16, the data from 16 participant farms in South Australia showed the average whole farm earnings before interest and tax (EBIT) of $164,253, a 25% decrease on 2014–15 ($217,956). Return on assets was 3.1% compared to last year's 3.9%. Production levels were slightly higher than last year with the average milk solids at 586 kg MS/cow and 751 kg MS/ha.

This is the fourth year of the Dairy Farm Monitor Project in South Australia. The project aims to provide the South Australian dairy industry with valuable farm level data relating to profitability and production.

The lower average milk price received and challenging seasonal conditions again this year, resulted in lower profit performance in 2015–16. In response to these challenges, dairy farmers took advantage of a strong cattle market to reduce cow numbers, save future supplementary feed costs and focused on per cow and per hectare milk production.

Average milk income in 2015–16 was $6.15/kg MS a 3.1% decrease on last year's milk income of $6.35/kg MS. This followed a 7.3% decrease the previous year.

To compensate, participant farmers supplemented gross farm income with 'other income' (including inventory changes, livestock trading profit and other income) which rose 42% from $0.67/kg MS (in 2014–15) to $0.95/kg MS this year. This was a key factor to dairy farmers maintaining their gross farm income at $7.10 this year ($7.03/kg MS in 2014–15).

With average gross farm incomes being maintained at 2014–15 levels, average cost of production was $6.03/kg MS. This at least allowed the average sampled South Australian dairy farmers a cash margin to continue to consolidate their businesses, attend to repairs and maintenance and make minimal capital purchases.

With none of the 16 dairy farms again this year in the project reporting above average rainfall, irrigators used their full water allocations to increase pasture and fodder production.

The tough seasonal conditions again in 2015–16, like 2014–15, resulted in home grown pasture levels and conserved pasture levels remaining the same as last year with the average estimated grazed pasture of 6.4 t DM/milking ha and 1.4 t DM/milking ha from conserved fodder. The lack of available pasture feed was supplemented by concentrates which again this year made up an average of 30% (31% in 2014–15) of total ME fed at an average cost of $366/t compared to $364/t last year.

As in 2014–15, seasonal conditions resulting in poor pasture production and to some degree high livestock prices maintained dairy farmers' focus on per cow milk production. The average stocking rate in South Australia this year rose to 1.4 cows/ha compared to 1.3 cows/ha in 2014–15.

Milk solids production per cow was maintained at 586 kg MS/cow in 2015–16, having had a 24% increase in per cow milk production in 2014–15 (581 kg MS/cow) from 468 kg MS/cow in 2013–14. Milk production per hectare increased slightly to 751 kg MS/ha in 2015–16 compared to 738 kg MS/ha in 2014–15, after a 12% increase the previous year (660 kg MS/ha in 2013–14).

The average earnings before interest and tax of $0.79/kg MS was slightly higher than last year's $0.72/kg MS.

Input costs continue to remain a concern for dairy farmers with the average South Australian participants' average cost of production at $6.03/kg MS ($6.34/kg MS in 2014–15). The top 25% achieved an average cost of production of $4.72/kg MS a decrease on last year's $5.18/kg MS – a key determinant of being a top 25% dairy farmer in 2015–16.

The top 25% have managed to continue to lower their variable costs again this year by 10.7% ($2.99/kg MS from $3.35/kg MS in 2014–15) and they continue to lower their average total overhead costs by 6% this year ($1.90/kg MS from $2.02/kg MS in 2014–15). This is largely due to a higher volume of milk that the top 25% sold per hectare compared to the average South Australian dairy farmer – 1,074 kg MS/ha (top 25%) and 751 kg MS/ha

The top 25% farms spent less on employed labour than the average ($0.66/kg MS top 25% and $0.80/kg MS average). Employed and imputed labour costs accounted for 53% of total overhead costs for the top 25% and 56% for the average South Australian participant.

The key indicators that distinguished the top 25% participants in 2015–16 are improved labour efficiency (113 milking cows/FTE; 88 milking cows/FTE for the average), higher milk sold per hectare (1,074 kg MS/ha top 25%; 751 kg MS/ha the average) due to higher stocking rates (1.9 cows/usable hectare top 25%; and 1.3 cows/usable hectare the average) along with lower costs of production ($4.89/kg MS top 25%; $6.03/kg MS average).

Expectations for 2016–17 were varied, with 43% of producers expecting milk prices to increase, although this information was collected just after the 2016–17 lower opening milk prices were announced. Still, 29% of dairy farmers were expecting milk prices to fall in 2016–17. Although the majority of dairy farmers expected milk prices to increase from those announced, 71% of dairy farmers did not plan to change milk production levels.

Not surpisingly given the lower announced prices for the 2016–17 financial year, most dairy farmers were concerned about milk prices and the flow-on effects on their cashflow and their cost of production.

Greenhouse gases emitted by South Australian dairy farmers were 14.11 t $CO_2$ -e/t MS produced with on average was 63% being $CH_4$, 26% being $CO_2$, and 11% for $N_2O$ emissions.

# Farm monitor method

# Farm monitor method

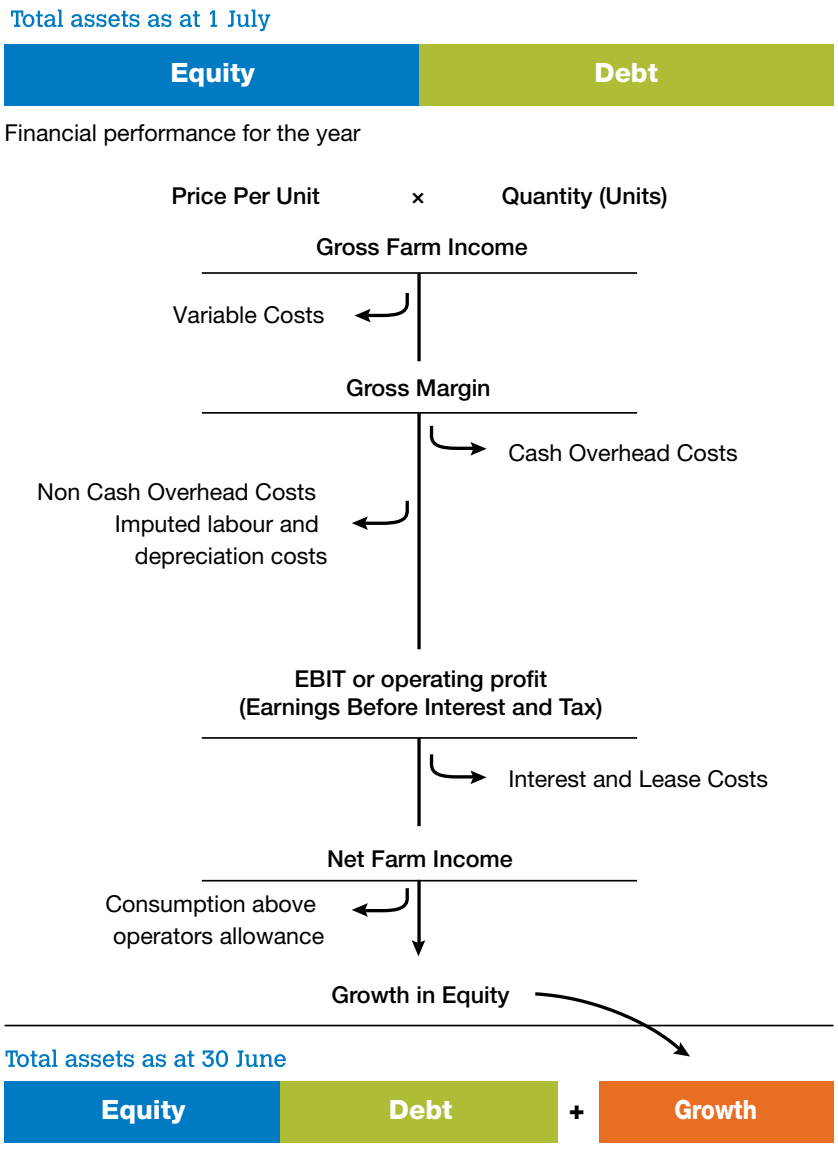
## This chapter explains the method used in the Dairy Farm Monitor Project (DFMP) and defines the key terms used.

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 (DFMP) reports. Readers should be aware that not all benchmarking programs use the same method or terms 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 gross farm 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.

The performance of all participants in the project using this method is shown in Figure 2. Production and economic data are both displayed 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 gross farm 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 DFMP 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

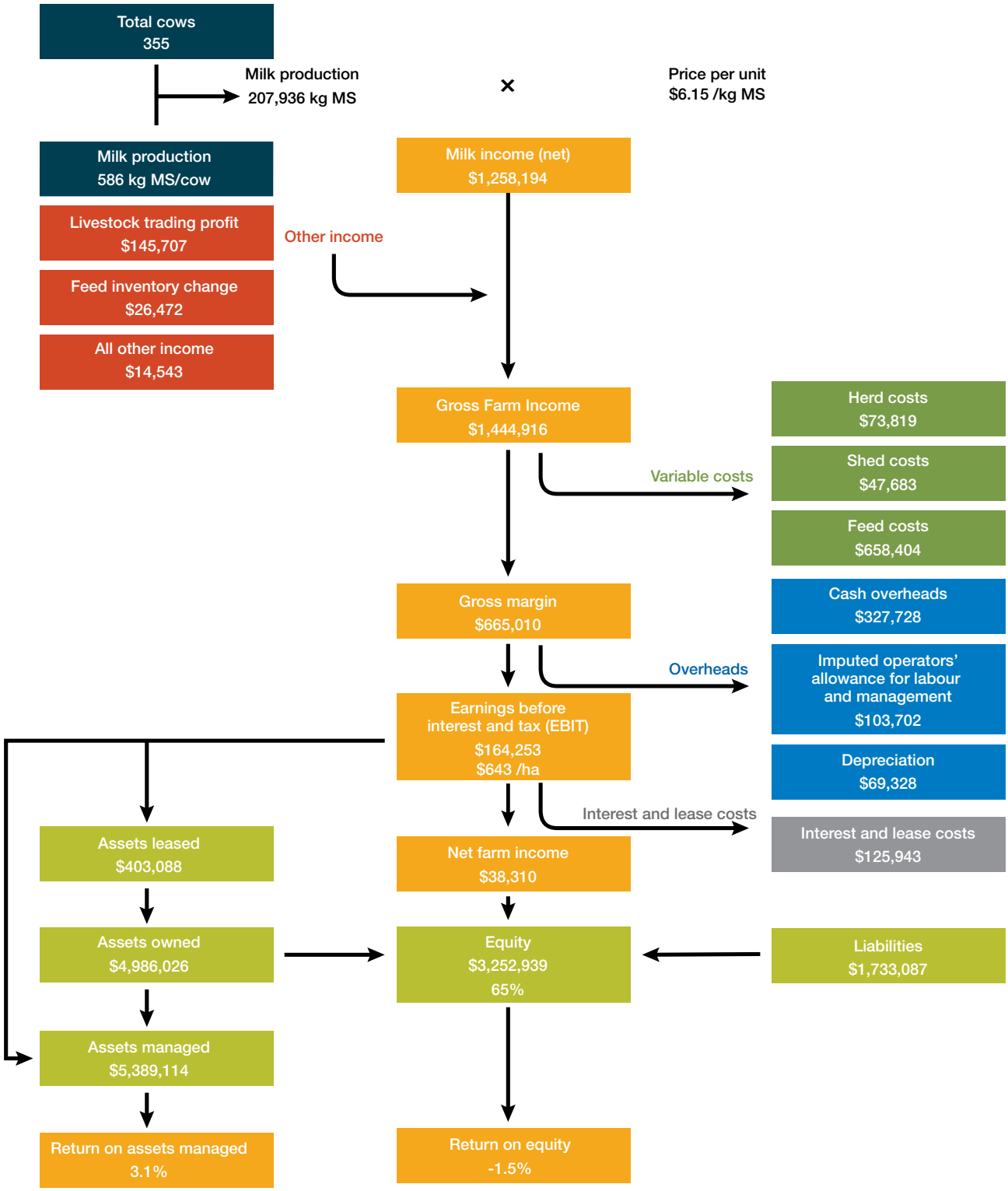
Two commonly used economic indicators of whole farm performance are return on assets (RoA) and return on equity (RoE). They measure the return to their respective capital base.

Return on assets indicates the overall earning of the total farm assets, irrespective of capital structure of the business. It is EBIT expressed as a percentage of the total assets under management in the farm business, including the value of leased assets. Return on assets is sometimes referred to as return on capital.

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. 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 DFMP reports RoE with and without capital appreciation. This is to distinguish between productivity gains (RoE without capital appreciation) and capital gains (RoE with capital appreciation). The RoE including capital appreciation is reported in Appendix Table A1.

**Figure 2** Dairy farm monitor project method profit map – state average 2015–16 data[1]




*1 Profit map adapted from Queensland Dairy Accounting Scheme – 2010 with permission from Ray Murphy, Department of Agriculture, Fisheries and Forestry, Queensland*

# South Australian overview

# South Australian dairy industry

South Australia represents approximately 5.3%, or 516.5 million litres, of the national output of milk in the Australian dairy industry.

The state's industry has a long history of high productivity and quality dairy produce. South Australia's milk has a record of high component values in terms of butterfat and protein which adds to its value in terms of product shelf-life and versatility to a processor.

There are three main dairying regions in South Australia. These are the Mid North, Central and South East as shown in Figure 3.

The Mid North including Barossa (shaded orange) is perhaps better known for its wine and crop production. There is, however, a thriving dairy industry in the region based on dryland systems supported by locally grown grain and hay. Milk production has increased in the past few years as a result of access to quality grain and hay supplies grown throughout the area.

The Central region (shaded blue) has three subregions – the Fleurieu Peninsula, River and Lakes and the Adelaide Hills. The Fleurieu Peninsula and Adelaide Hills traditionally have high average annual rainfalls and higher land values. They are predominantly dryland dairy farming areas. The number of farms in the area is contracting but total cow numbers and milk production are holding steady. These well-known and productive dairy regions are under increasing threat from urban sprawl and other competing land uses, making it difficult to achieve an acceptable return on total assets. However, the farmers in these regions remain committed to high quality milk and have productive herds.

**Figure 3** South Australian dairying regions


The River and Lakes have a history of being affected by severe water restrictions particularly during the 2000s and drought times. These farms are more dependent on irrigation and natural water flows for fodder production and livestock and domestic purposes than the Mid North, Fleurieu Peninsula and Adelaide Hills. The irregularity of Murray River flows during the 2000s has reduced the number of dairy farms in the region but numbers have now stabilised. Dairy farmers from the Rivers and Lakes are resilient and have had to develop more flexible dairy farming models to remain profitable.

The South East of South Australia (shaded green) is regarded as an integral part of the future growth of the "South West Victorian" milk bowl. Its longer growing season (April to end November, or longer) and ready access to high quality underground water enables irrigation to extend the growing season and makes this region a premium dairying area in South Australia. This region produces over 60% of South Australia's milk.

There are a number of different dairying systems in South Australia. These have been developed by dairy farmers to take advantage of regional strengths. For example in the Mid North, River and Lakes regions of South Australia, the close proximity to South Australia's cereal zone has seen 'total (and 'partial') mixed rations' dairies rise in numbers. In the South East of South Australia, the best use of its regional strength – high quality underground water – sees predominantly irrigation and (mainly) grass based dairies, although concentrates still form an integral part of a cow's diet.

It is important to recognise, that this report contains data from all the representative types of dairying systems available in South Australia and not one particular type.

# 2015–16 Seasonal conditions

The 2015–16 year was characterised by a wet winter (July 2015), an early finish to spring with late winter and spring rainfall well below long term trend. Dairy farmers reacted to the poor spring by irrigating more and by maintaining their high conserved fodder reserves (1.4 t DM/milking ha in 2015–16 and 2014–16) to get them through the season. Useful storms in late January/ early February 2016 allowed irrigators to commence irrigating and push pasture production into March with strategic fertiliser use and grazing management but plans for an early break to the season were curtailed by a long, dry autumn for all dairying areas of South Australia that resulted in a May break to the season.

Seasonal conditions were less than favourable across the dairy regions of South Australia during 2015–16. Again, for the second year running, there were no farms that recorded average or above rainfall for the financial year (Figure 4).

The season started with a favourable but late April/May (2015) break followed by winter rainfall averages being well below long term averages (Figure 5). June (2015) was dry and cold but July returned excellent rains and soil moisture reserves were quickly replenished. September and October are usually reliable rainfall months but disappointingly in 2015–16 they were well below average rainfall. Dairy farmers reacted by again, making earlier plans to conserve fodder which was then required to be fed out throughout an expected dry summer and autumn.

The average conserved fodder yields (on the milking area) were 1.4 DM/ha (same as last year) with a range of 0 to 4.6t DM/milking ha.

The top 25% participants also maintained reasonably high levels of conserved fodder in 2015–16 (0.7 t DM/ha compared to 0.9 t DM/ha in 2014–15).

The early finish to spring had irrigation commencing as early as August in the South East of South Australia. Summer storms allowed some Central South Australian dairy farmers with irrigation to recommence irrigating.

Since 2013–14 irrigators have had to use their full water allocations to increase pasture and fodder production to make up for a lack of rainfall. Dry land dairies have had to rely on conserved (spring) fed back out over summer and autumn.

**Figure 4** 2015-16 annual rainfall and long term average rainfall of participant farms

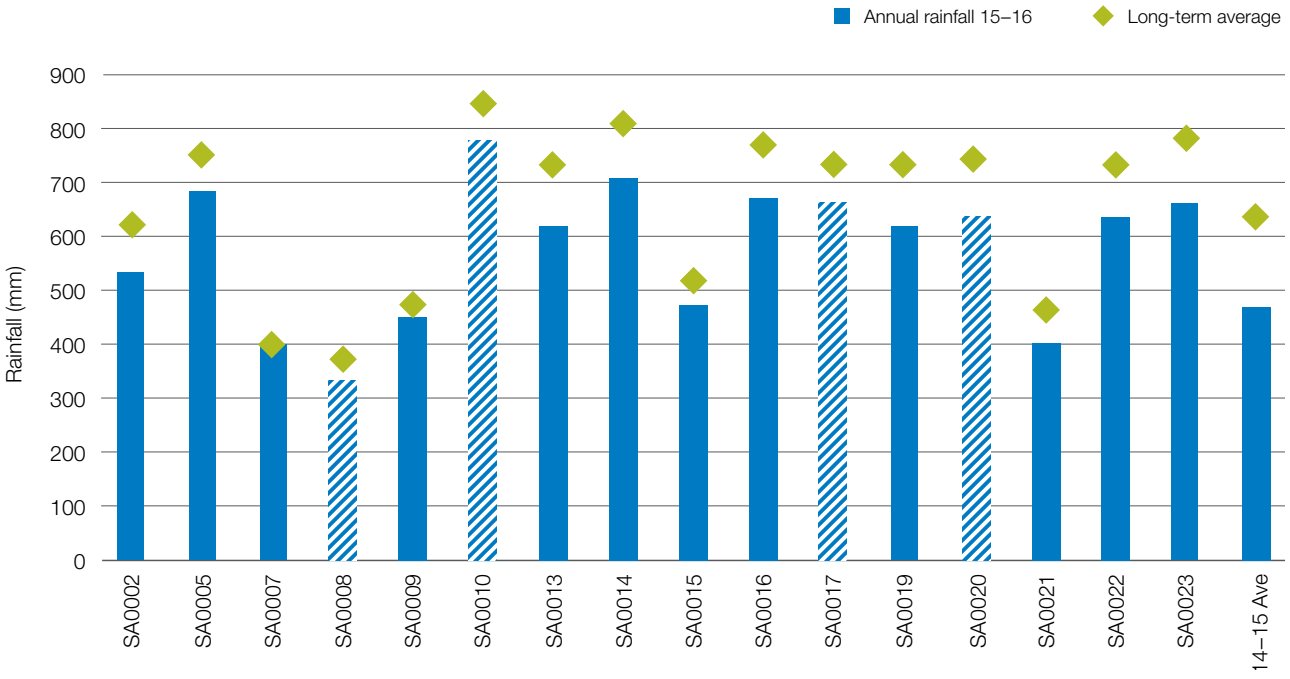
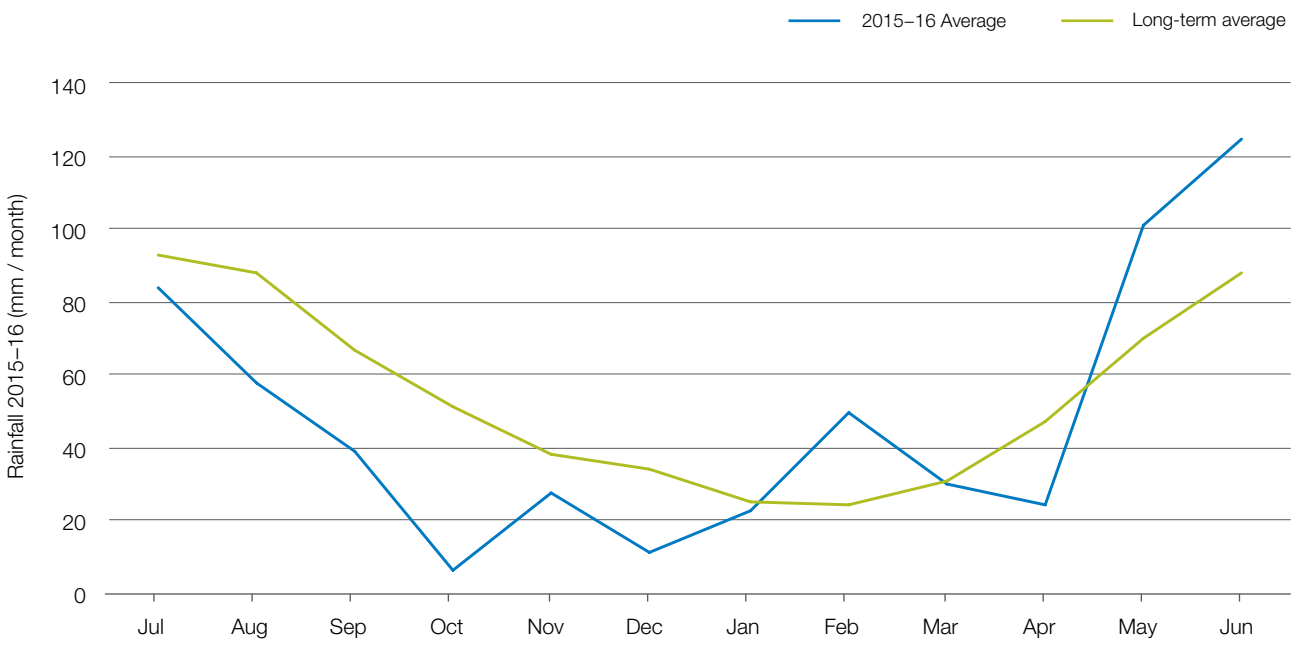


**Figure 5** Monthly average rainfall (all farms)




# Whole farm analysis

The key features that made top 25% farms in South Australia in 2015–16 were the same key features that made 2014–15 top 25% dairy farmers in that year – higher stocking rate producing higher kg milk solids per hectare (not per cow) as a result of growing and utilising more home grown feed through utilising rain and irrigation and milking through labour efficient dairies. Key whole farm physical parameters for South Australia are presented below in Table 1. The Q1 – Q3 range shows the band in which the middle 50% of farms for each parameter sit.

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

South Australian participant dairy farmers for 2015–16 had lower average herd size of 355 cows/farm compared to 362 cows last year (Table 1). They carried an average stocking rate of 1.4 cows/usable hectare compared to the top 25% farms with 1.9 cows/usable hectare.

The top 25% farms produced only 1% more kg milk solids sold (593 kg MS/cow) than the average (586 kg MS/cow). Again this year, through a combination of higher stocking rate (36%) and slightly more productive cows, the top 25% sold 43% more kg milk solids per hectare (1,074 kg MS/ha) than the average (751 kg MS/ha).

The top 25% of South Australian dairy farms achieved these production efficiencies through a combination of pasture production and consumption efficiencies and labour efficiencies. The top 25% grew and utilised more home grown feed (as a % of ME consumed) – 63% of home-grown feed utilised of ME consumed for the top 25% compared to the average of all farms with 48%. One main contributing factor for the top 25% was having access to and utilising more water (rainfall and irrigation) to grow feed (22% more water used – 951 mm of water used compared to 779 mm for the average).

The home grown feed consumed Q1 to Q3 range of 35% to 66% illustrates the wide range of home-grown feed supplied by South Australian dairy farmers (Table 1).

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

| Farm physical parameters | Average | Q1 to Q3 range | Top 25% average |
|---|---|---|---|
| Herd size (no. cows milked for at least 3 months) | 355 | 272 – 430 | 331 |
| Annual Rainfall 2015–16 | 577 | 466 – 664 | 605 |
| Water used (irrigation + rainfall) (mm/ha) | 777 | 503 – 1,022 | 951 |
| Total usable area (hectares) | 447 | 202 – 466 | 244 |
| Milking cows per usable hectares | 1.4 | 0.6 – 1.6 | 1.9 |
| Milk sold (kg MS /cow) | 586 | 549 – 652 | 593 |
| Milk sold (kg MS /ha) | 751 | 371 – 1,010 | 1,074 |
| Home grown feed as % of ME consumed | 48% | 35% – 66% | 63% |
| Labour efficiency (milking cows / FTE) | 88 | 67 – 94 | 113 |
| Labour efficiency (kg MS / FTE) | 50,701 | 40,715 – 54,383 | 65,815 |

The top 25% were also 28% more efficient with their labour use, milking 113 cows per full time equivalent labour unit (cows/FTE) compared to 88 milking cows/FTE for the average, and producing 65,815 kg MS/FTE or 30% more efficient than the average at 50,701 kg MS/FTE.

## Gross farm income

Gross farm income is inclusive of all farm incomes. It includes income from milk sales, livestock trading profit, milk factory shares and increases/decreases of feed inventories.

Figure 6 on page 14 represents the gross farm income for participant farms throughout the South Australian dairying areas. The range of gross farm income received was between $5.95/kg MS and $8.33/kg MS with an average of $7.10/kg MS ($7.03/kg MS in 2014–15). The top 25% averaged $6.57/kg MS (range $5.96/kg MS to $7.44/kg MS), $6.98/kg MS in 2014–15.

This year, the difference in the gross income between the average and the top 25% was $0.53/kg and largely due to the higher 'all other income' of the average $0.95/kg MS) as opposed to the top 25% 'all other income' of $0.65/kg MS. Even though there was a large difference in the gross income between the average and the top 25%, gross farm income *per se* was not a determinant of being a top 25% South Australian dairy farmer in 2015–16.

Financial year 2015–16 was a relatively good year for milk prices throughout South Australia with an average of $6.15/kg MS, a decrease of 3.1% on last year when average price received was $6.35/kg MS. This continues a disappointing trend for South Australian dairy farmers with the 2014–15 milk prices achieved being a 7% decrease on the 2013–14 year.

**Figure 6** Gross farm income of per kilogram of milk solids


## Milk solids sold

Figure 7 shows the quantity of milk solids sold per usable hectare. The wide range of the quantity of milk sold per hectare is a reflection of the diverse dairy farming systems throughout South Australia rather than the quality of management.

The quantity of milk solids sold ranged from 137 kg MS/ha to 1,739 kg MS/ha with an average of 751 kg MS/ha (1.8% higher than the 2014–15 average of 738 kg MS/ha). South Australia's top 25% averaged 1,074 kg MS/ha sold, 1.8% lower than 2014–15 when 1,094 kg MS/ha sold was achieved.

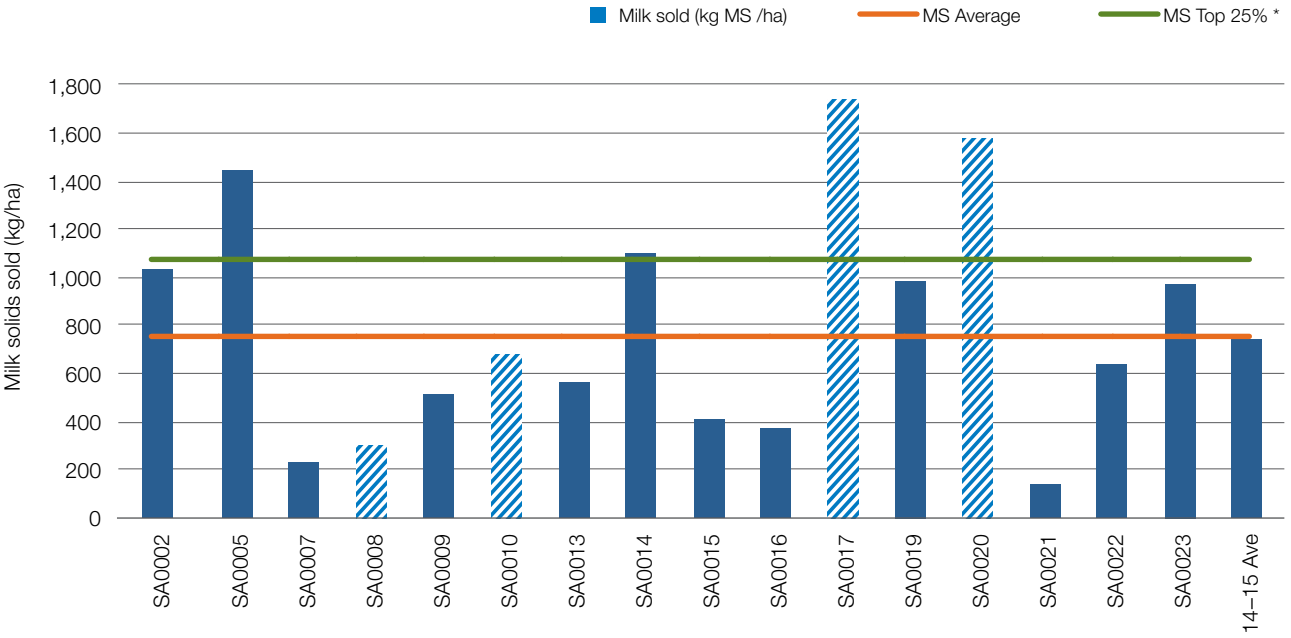
The high average milk solids sold per hectare was due to improved cow productivity and having to maintain high numbers of cows per usable hectare (as was the case in 2014–15) as a result of the tight feed season in 2015–16.

In 2015–16 the average number of cows milked was 355 cows/farm (on 447 hectares usable area) compared to 362 cows/farm in 2014–15 (on 529 hectares usable area).

It was a similar story for the top 25% farmers who maintained their high per cow production (593 kg MS/ha), although a 3.3% reduction from 2014–15 (613 kg MS/cow) after a 30% increase in per head production from the 2013–14 (471 kg MS/cow) due to maintaining high stocking rates – 1.9 cows/usable hectare.

There was a 1.8% increase in milk solids sold per hectare in 2015–16 due to 11 of the 13 dairy farmers

**Figure 7** Milk solids sold per hectare



who participated in both 2014–15 and 2015–16 program increasing their kg MS/ha (on average by 1.3%) and two who reduced their kg MS/ha (on average by 15.2%) but they did reduce production from a low 2014–15 production base so their results require careful consideration.

All four farms in this year's top 25% increased their milk solids sold (kg MS) per hectare by an average of 5.3%. These farms were from two of the state's three dairying regions and three were irrigators.

Such a wide variation in milk solids sold in 2015–16 was due to the differences in rainfall, irrigation use, growing season, soil types and diverse farming systems in the dairying areas of South Australia.

Much of the variation in milk solids per hectare for the top 25% (as compared to the average) can be explained by the fact that the top 25% grew and utilised more home grown feed than the average, as a result of the access to and utilisation of more water to grow feed.

Two of the top 25% farms (only one in 2014–15) were well below the average kg MS/ha line (Figure 7). This suggests that milk solids sold per hectare is not the only determinant to being a top 25% producer in 2015–16.

## Milk sales versus calving pattern

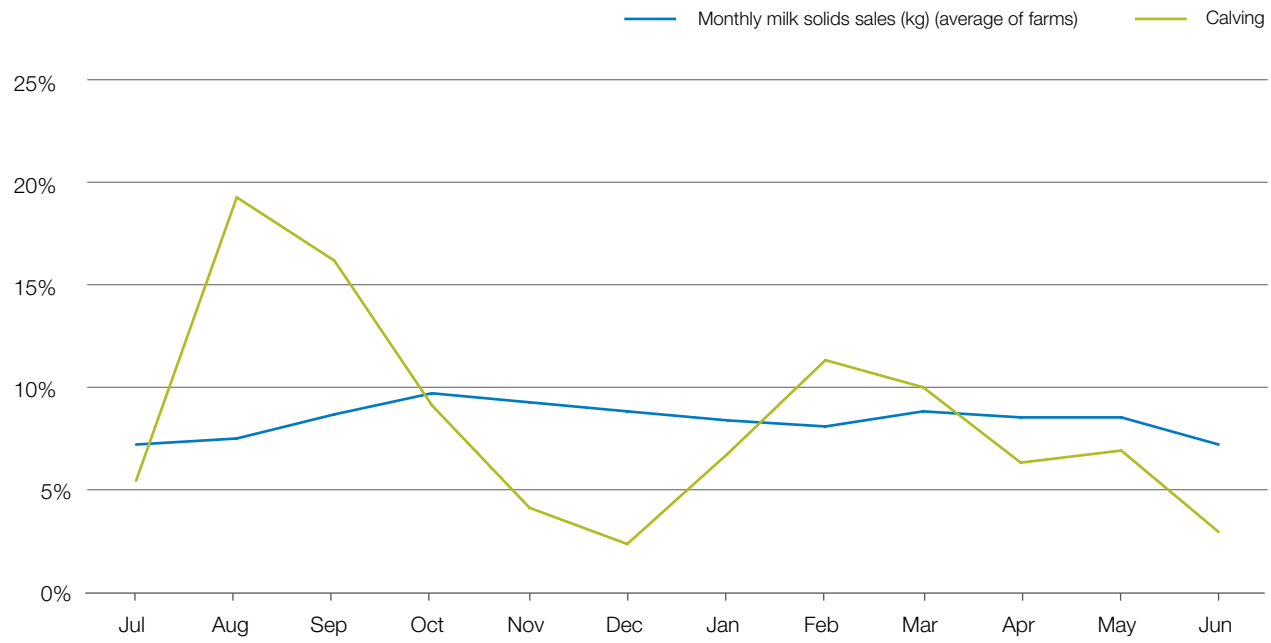
Figure 8 below shows the average milk sales for all participant farms against the monthly distribution of calves born. Year round calving is evident with peaks in spring and autumn.

Although there were peaks and troughs in calving, milk sales were relatively stable with dairy farmers taking advantage of better out-of-season prices than is normally available in spring.

Milk sales recorded the lowest monthly figure amongst dairy farmers in July which reflects of targeting calving to coincide with optimal spring pasture growth. Calvings continue throughout spring. Milk sales dip again in February when autumn calving commences.

This indicates that seasonal, split calving and year round calving patterns are present in South Australia. This has been a relatively stable pattern since the South Australian Dairy Monitor Project commenced in 2012–13.

**Figure 8** Milk sales vs calving pattern



## Variable costs

Variable costs (Figure 9) are those that change directly according to the amount of output and are measured in cost per kilogram of milk solids. Variable costs include herd, shed and feed costs.

Average South Australian variable costs have continued to remain steady (but higher than the top 25%) over the last three years – $3.71/kg MS (2015–16), $3.79/kg MS (2014–15) and $3.81/kg MS (2013–14).

The top 25% however, have reduced their variable costs – $2.99/kg MS (2015–16), $3.35/kg MS (2014–15 and 2013–14) and $3.02/kg MS in 2012–13.

Within total variable costs, there is a considerable difference between the top 25% and the average. Of this year's variable costs, the herd and shed costs were $0.57/kg MS on average for the state and $0.48/kg MS for the top 25% ($0.51/kg MS and $0.53/kg MS in 2014–15, respectively).

The top 25% of dairy farmers had a lower overall cost of home grown and purchased feed than the average of all participant farms. Like 2014–15, the top 25% home grown feed costs were lower (21%) than the average, $0.83/kg MS compared to $1.05/kg MS average for the state. Their purchased feed costs (including agistment) were $1.68/kg MS compared to the average of $2.08/kg MS. The average price of purchased feed, however, was lower at $294/t DM compared to $317/t DM for the top 25%.

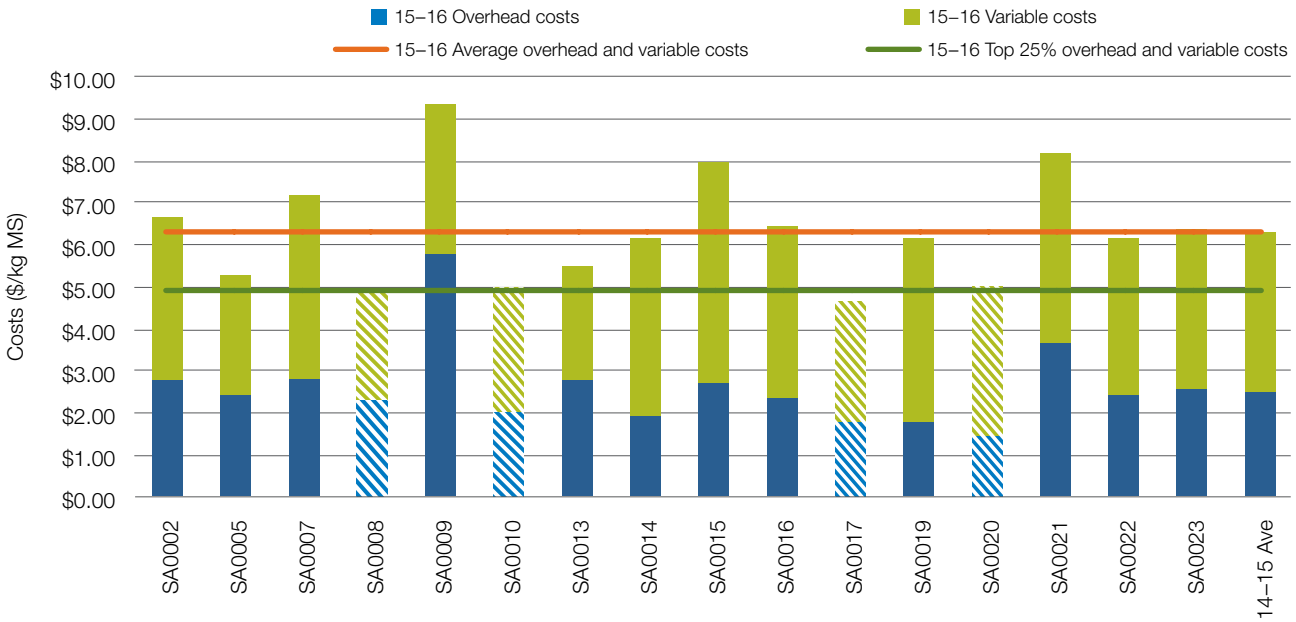
## Overhead costs

Overhead costs are those that do not vary with the level of production. The Dairy Farm Monitor Project includes cash overheads such as rates and insurance as well as non-cash costs such as imputed owner operator and family labour and depreciation of plant and equipment. The overhead costs this year ranged from $1.46/kg MS to $5.80/kg MS (shown as blue bars in Figure 9).

In 2015–16, the average overhead costs ($2.60/kg MS) were 3.1% higher than 2014–15 ($2.52/kg MS). This ends the three-year trend of lower overheads. The rise this year is largely due to an increase in repairs and maintenance ($0.42/kg MS in 2015–16 from $0.37/kg MS in 2014–15), employed labour ($0.77/kg MS in 2014–15 to $0.80/kg MS in 2015–16) and depreciation ($0.28/kg MS in 2014–15 to $0.34/kg MS in 2015–16). For the average sampled South Australian dairy farmer, imputed labour costs fell from $0.75/kg MS (2014–15) to $0.66/kg MS this year even though the imputed labour rate increased from $25/hr to $28/hr.

For the top 25%, their average overhead costs were largely the same in 2015–16 ($1.90/kg MS) as in 2014–15 ($1.89/kg MS). Like last

**Figure 9** Whole farm variable and overhead costs per kilogram of milk solids



year, the top 25% have lower imputed labour costs ($0.35/kg MS) than the average ($0.66/kg MS) that contributes to their lower overhead structure. Additionally, the top 25% have lower employed labour cost ($0.66/kg MS) than the average ($0.80/kg MS).

A large part of the lower overhead costs per kg MS sold for the top 25% than the average can be attributed to a more efficient use of employed and imputed labour. Their cash and non-cash overheads per kg MS sold were 29% and 53% lower than the average, respectively. This allows the top 25% to have a lower overall overhead costs structure than the averge South Austrlian dairy farmer.

A break down of the overhead costs in $/kg MS is provided in Appendix Table A5.

## Cost of production

Cost of production gives an indication of the average cost of producing a kilogram of milk solids. It is calculated as variable plus overhead costs and accounts for changes in fodder inventory and livestock trading losses. Including changes in fodder inventory is 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 the cost of production where there is a net livestock depreciation or reduced stock numbers.

Table 2 shows that the average cost of production (with inventory changes accounted for) was 28% higher ($6.03/kg MS) than the top 25% ($4.72/kg MS).

**Table 2** Cost of production

| Farm costs ($/kg MS) | Average | Q1 to Q3 range | Top 25% average |
|---|---|---|---|
| **Variable costs** | | | |
| Herd costs | $0.34 | $0.27 – $0.41 | $0.26 |
| Shed costs | $0.24 | $0.018 – $0.31 | $0.22 |
| Purchased feed and agistment | $2.08 | $1.68 – $2.36 | $1.68 |
| Home grown feed costs | $1.05 | $0.87 – $1.25 | $0.83 |
| **Total variable costs** | **$3.71** | **$2.92 – $4.25** | **$2.99** |
| | | | |
| **Overhead costs** | | | |
| Employed labour cost | $0.80 | $0.62 – $1.02 | $0.66 |
| Repairs and maintenance | $0.42 | $0.31 – $0.49 | $0.29 |
| All other cash overheads | $0.38 | $0.26 – $0.44 | $0.29 |
| **Total cash overheads** | **$1.60** | **$1.32 – $1.79** | **$1.24** |
| **Cash cost of production** | **$5.31** | **$4.70 – $5.88** | **$4.23** |
| | | | |
| Depreciation | $0.34 | $0.15 – $0.44 | $0.31 |
| Imputed labour costs | $0.66 | $0.34 – $0.82 | $0.35 |
| **Non-cash overheads** | **$1.00** | **$0.53 – $1.35** | **$0.65** |
| **Cost of production without inventory changes** | **$6.31** | **$5.23 – $6.76** | **$4.89** |
| | | | |
| **Inventory changes** | | | |
| +/- feed inventory change | -$0.14 | -$0.25 – $0.00 | -$0.11 |
| +/- livestock inventory change less purchases | -$0.13 | -$0.15 – -$0.01 | -$0.05 |
| **Cost of production with inventory change** | **$6.03** | **$5.12 – $6.51** | **$4.72** |

The average of the sampled South Australian dairy farmer did reduce their cost of production by 4.9% compared to 2014–15 ($6.03/kg MS versus $6.34/kg MS in 2014–15).

The top 25% also managed to reduce their overalll cost of production by 8.9% compared to 2014–15 ($4.72/kg MS versus $5.18/kg MS in 2014–15).

Both the average group of dairy farmers and the top 25% ran down their feed inventories (-$0.14/kg MS average and -$0.11/kg MS top 25%) and livestock inventories ($0.13/kg MS average and -$0.05/kg MS top 25%). Having a low cost of production (variable and cash and non cash overheads) is a key determinant of being a top 25% producer in 2015–16.

## Earnings before interest and tax

Earnings before interest and tax (EBIT) is the gross farm income less variable and overhead costs. As EBIT excludes interest and lease costs, it is a valuable measure of operating profit.

Figure 10 shows that the average EBIT for 2015–16 was $0.79/kg MS, 9.7% higher than 2014–15 ($0.72/kg MS).

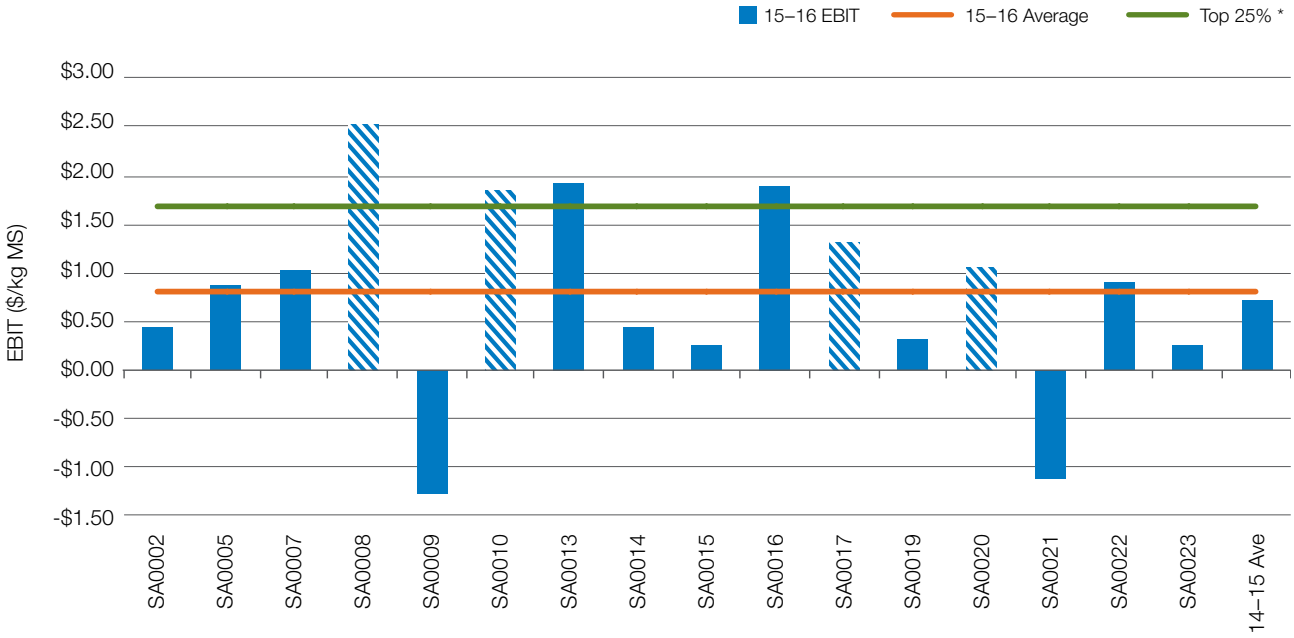
The 9.7% rise in EBIT/kg MS in 2015–16 was a considerable turnaround on last year and is largely explained by a 4.9% reduction in their costs of production ($6.03/kg MS versus $6.34/kg MS in 2014–15) and a 1% increase in gross income/kg MS ($7.10/kg MS in 2015–16 and $7.03/kg MS in 2014–15).

The top 25% in 2015–16, recorded an EBIT of $1.68/kg MS or 127% of the average ($0.79/kg MS). However the top 25% EBIT this year was 3.4% lower than last year's result of $1.74/kg MS.

While the average South Australian dairy farmer has increased their EBIT as a result of reducing costs and increasing gross milk income, they are still not to the same level as that of the top 25%. Like last year, the top 25% in 2015–16 were still able to retain 25% of their gross farm income as EBIT whereas this figure was 11% of gross farm income as EBIT for the average in 2015–16 and 10% in 2014–15.

Even though the average gross income was 7.5% higher than the top 25% ($7.10/kg MS for the average versus $6.57/kg MS for the top 25%), it was not a key determinant to reliably generate a high EBIT/kg MS. In 2015–16, the key determinant to generating high EBIT/kg MS for the top 25% was a lower cost rather than higher income. The top 25% incurred a 22% lower cost of production ($4.72/kg MS versus $6.03/kg MS for the average). Their total milk solids sold was 8% lower (191,938 kg MS compared to the average of 207,936 kg MS) and their average milk income was 3.9% lower than the average ($5.92/kg MS and $6.15/kg MS for the average).

**Figure 10** Whole farm earnings before interest and tax per kilogram of milk solids



## Return on assets and equity

Return on assets is the 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. Figure 11 to Figure 14 were calculated excluding capital appreciation. For return on equity including capital appreciation refer to the Appendices.

The average return on assets for participants across South Australia was 3.1% with the top 25% achieving 6.2%. Although lower than last year's return on assets (3.9% the average and 9.3% top 25%), this was still a good result for both groups considering the growing season challenges.

In 2015–16, no farms achieved a return on assets greater than 10%, six farms recorded between 5% and 10%, eight farms achieved between 0% and 5% and two farms had returns on assets of between -5% and 0% (Figure 11).

These were still good performances given the early finish to spring 2015 similar to 2014–15, lower milk prices and higher feed costs experienced in the 2015–16 season.

In achieving an average return on assets of 6.2% (range 5.5% to 7.9%), the top 25% continued to have business choices for their profit – consolidate short and long term debt and/or purchase capital items (Figure 12).

The average of the South Australian participants however, relied upon good milk prices rather than efficient management of costs – with their cost of production at $6.03/kg MS.

**Figure 11** Distribution of farms by return on assets

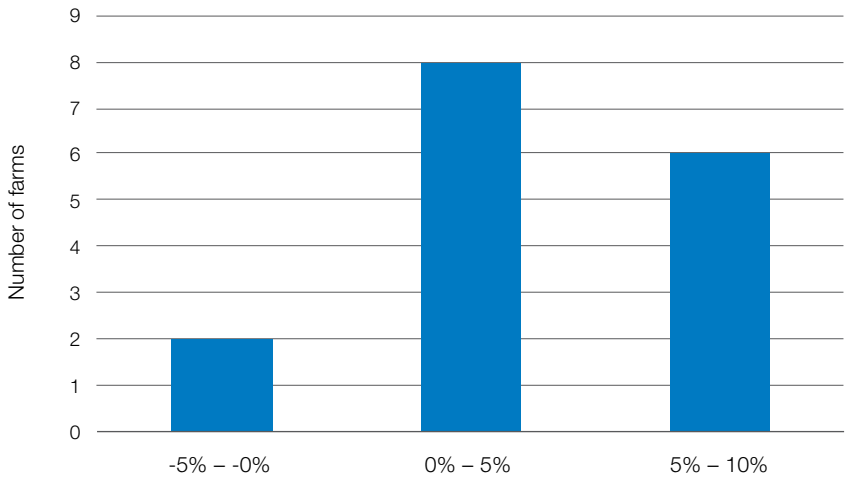
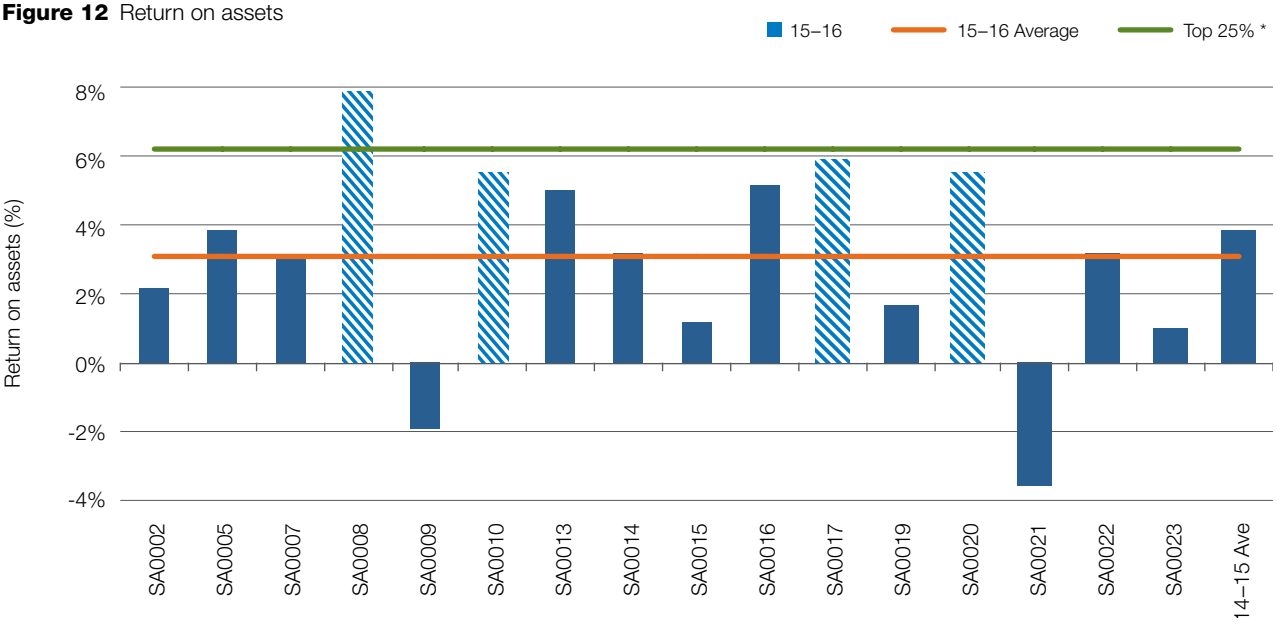



**Figure 12** Return on assets



Return on equity is the net farm income expressed as a percentage of owners' equity. It is a measure of the owners' rate of return on their investment.

Nine farms posted positive return on equity (Figure 13). Three farms recorded return on equity of between 0% and -5% and two farms with equity of between -5% and -10% and two farms with return on equity of lower than -15%.

The average return on equity this year was -1.5% (Figure 14), compared to 3.6% in 2014–15, 8.5% in 2013–14 and -4.9% in 2012–13 when the South Australian dairy farm monitoring program began.

Given the average return on assets in 2015–16 was 3.1% and average return on equity was -1.5% this indicates that gearing levels and the servicing of debt are beginning to bite into owners' equity.

The top 25% recorded an average return on equity of 6% considerably lower than 2014–15 return on equity of 12.7% (and 16.3% in 2013–14). Their return on equity and return on assets of 6.2% indicates that their gearing levels are sustainable for now.

For more information, Appendix A1 presents the return on assets and return on equity for all participant farms.

**Figure 13** Distribution of farms by return on equity

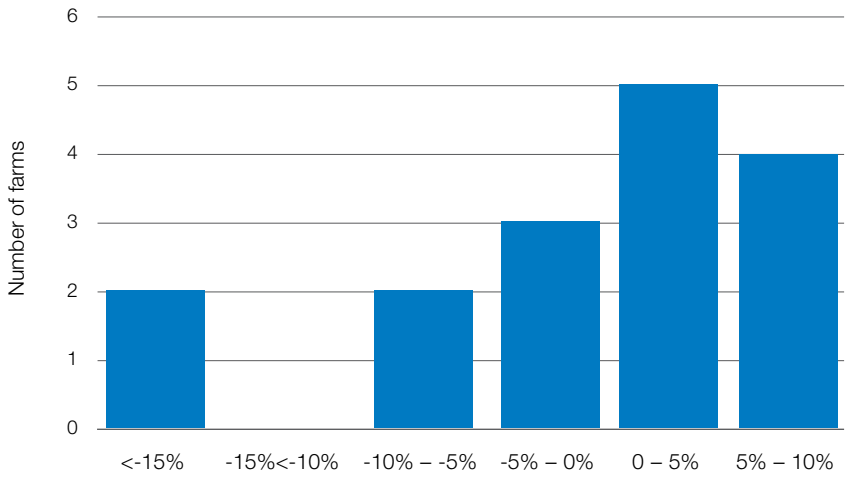
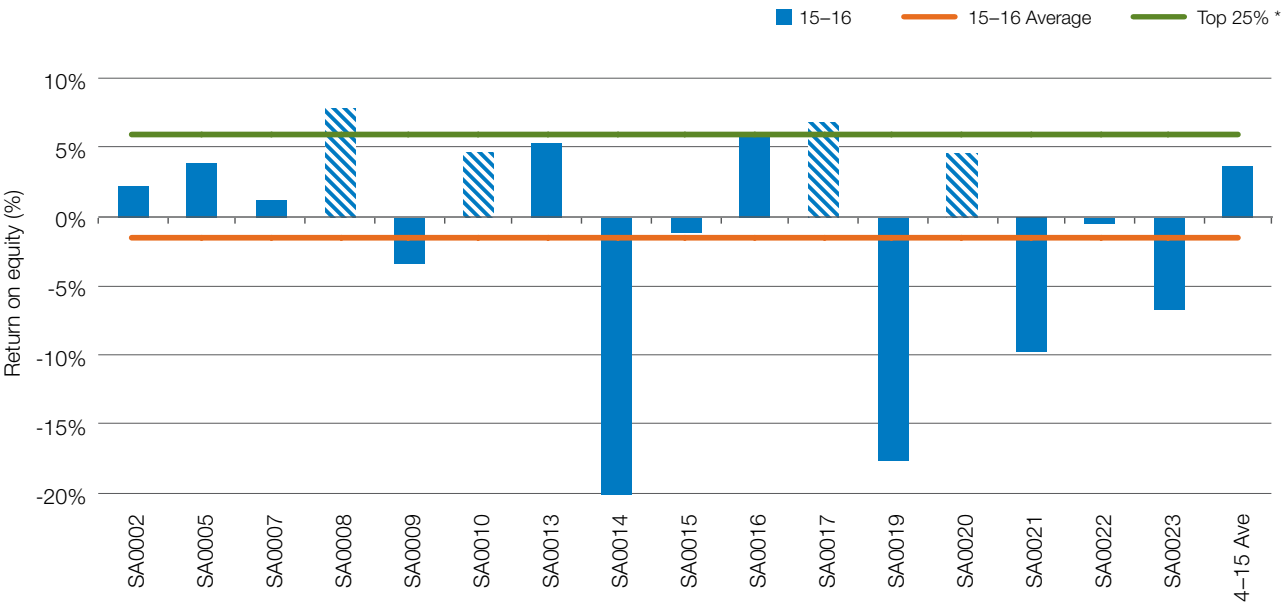



**Figure 14** Return on equity



## 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"[2].

Table 3 presents some key risk indicators. Refer to Appendix E for the definition of terms used in Table 3. These indicators can also be found in Appendix Tables A1, A3 and A8.

Exposure to risk in business is entirely rational if not unavoidable. It is through managing risk that greater profits can be made. It is also the case that by accepting a level of risk in one area of business, a greater risk in another area can be avoided. Using the example of feed sources, dairy farmers are generally better at dairy farming than they are at grain production. Thus by allowing someone who is experienced in producing grain to supply them, they lessen the production and other business risks as well as the financial risks dairy farmers would have exposed themselves to by including extensive cropping in their own business. The trade-off is that they are in turn exposed to price and supply risks.

The trade-off between perceived risk and expected profitability will dictate the level of risk a given individual is willing to take. It then holds that in regions where risk is higher, less risk is taken. While in good times this will result in lower returns, in more challenging times it will lessen the losses.

The higher the risk indicator (or lower equity %) in Table 3, the greater the exposure to the risk of a shock in those areas of the business. Further, the data in Appendix Tables A4 and A5 are in cost per kilogram of milk solids sold. This data set is best used as risk indictors, given it is measured against the product produced and sold currently and not the capital invested.

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, $0.59 was used to cover variable costs in 2015–16. However it is worth noting that cost structure varies between farms. One hundred minus this percentage gives the proportion of total costs that are overhead costs.

The debt servicing ratio shows interest and lease costs, as a proportion of gross farm income. The ratio of 8% this year is similar to previous years. It indicates that on average, farms repaid $0.08 of every dollar of gross farm income to their creditors.

Equity levels across the state decreased this year, with an average of 65% reported in 2015–16 compared to 69% the previous two years (2013–14 and 2014–15) and much lower than in 2012–13. Caution should be exercised when comparing equity levels between years as the farms in the sample changes.

The benefit of taking risks and borrowing money can be seen when farm incomes yield a higher RoE than on their RoA. When the percentage of RoE increases compared to RoA, it is the result of a higher return from the additional assets than the interest or lease rate. In 2015–16, only four of the 16 (25%) participant farms received a RoE greater than their RoA. Last year six of the 20 (30%) participant farms achieved this.

This year, all farms in the DFMP sourced at least some of their metabolisable energy (ME) from imported feeds and are therefore somewhat exposed to fluctuations in prices and supply in the market for feed. The proportion of imported feed has been increasing. In 2015–16 the average proportion of imported feed slightly increased from 2014–15 and much higher than in 2013–14, reflecting the challenging climatic conditions.

**Table 3** Risk Indicators – Statewide

| | 2012–13 | 2013–14 | 2014–15 | 2015–16 |
|---|---|---|---|---|
| Cost structure (proportion of total costs that are variable costs) | 57% | 57% | 61% | 59% |
| Debt servicing ratio (percentage of income as finance costs) | 8% | 7% | 8% | 8% |
| Debt per cow | $3,411 | $3,439 | $3,991 | $4,803 |
| Equity percentage (ownership of total assets managed) | 74% | 69% | 69% | 65% |
| Percentage of feed imported (as a % of total ME) | 49% | 43% | 51% | 52% |

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

# Physical measures

Dairy farms in South Australia exhibited a wide range of feeding systems. Directly grazed pasture was the dominant source of metabolisable energy supplying on average 37% of metabolisable energy fed to livestock, similar to last year's 40%. In 2015–16, farmers applied an average of 192 kg/ha of nutrients, 63% being nitrogen.

## Feed consumption

Pasture consumption is calculated as the gap between the total energy required on farm for all livestock classes and the energy provided from concentrates, silage, hay and other sources. A further description of the Energetics method used to calculate energy sources and feed consumption can be found in the Appendix B.

The range of home grown feed consumed per milking hectare varied greatly between sampled South Australian producers (Figure 15). For 13 of 16 farms, pasture grazed accounted for a large source of metabolisable energy (ME) fed to livestock at an average of 40% of total ME. Notably, the top 25% averaged 51% (61% in 2014–15) of ME sourced from grazed pasture (range 30% to 71%), with one farm achieving 71% of total ME sourced from pasture grazed.

The average estimated grazed pasture and conserved feed per milking hectare were the same as last year's – 6.4 t DM/ha grazed and 1.4 t DM/ha harvested as conserved feed.

The top 25% grazed pasture was 8.3 t DM/ha (11.7 t DM/ha in 2014–15), or 30% more than the average (6.4 t DM/ha). Clearly, the top 25% grew more grazed pasture than the average and sourced 51% of ME from grazed pasture (37% the average). Lower feed cost is one of the key determinants to being a top 25% dairy farmer in 2015–16, as is growing more grazed pasture.

Concentrates were the next highest source of total ME fed to livestock with an average of 30% of total ME fed and 28.5% of total ME fed by the top 25%. The dairy farmers maintained the average proportion of concentrates in total ME fed (30% also in 2014–15) because the prices were similar ($366/t DM in 2015–16 and $364/t DM in 2014–15). The top 25% paid a lower price of $339/t DM than the average.

Fodder conserved averaged (1.4 t DM/ha) and ranged from 0 t DM/ha to 4.6 t DM/ha (Figure 16). The top 25% conserved less quantities of fodder (higher utilisation of grazed pasture) with 0.7 t DM/ha fodder conserved ranging from 0 t DM/ha to 1.3 t DM/ha.

Grazed pasture consumption was estimated by using a back calculation method. It should be noted that there can be a number of sources of error in this method 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 15** Sources of whole farm metabolisable energy

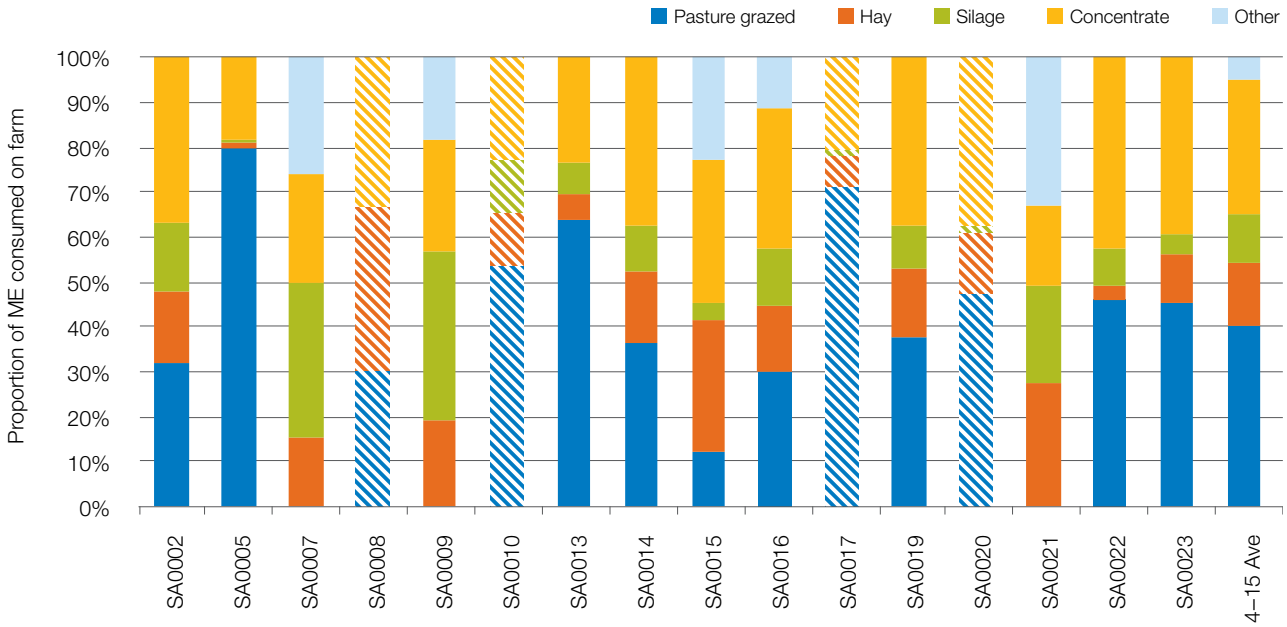
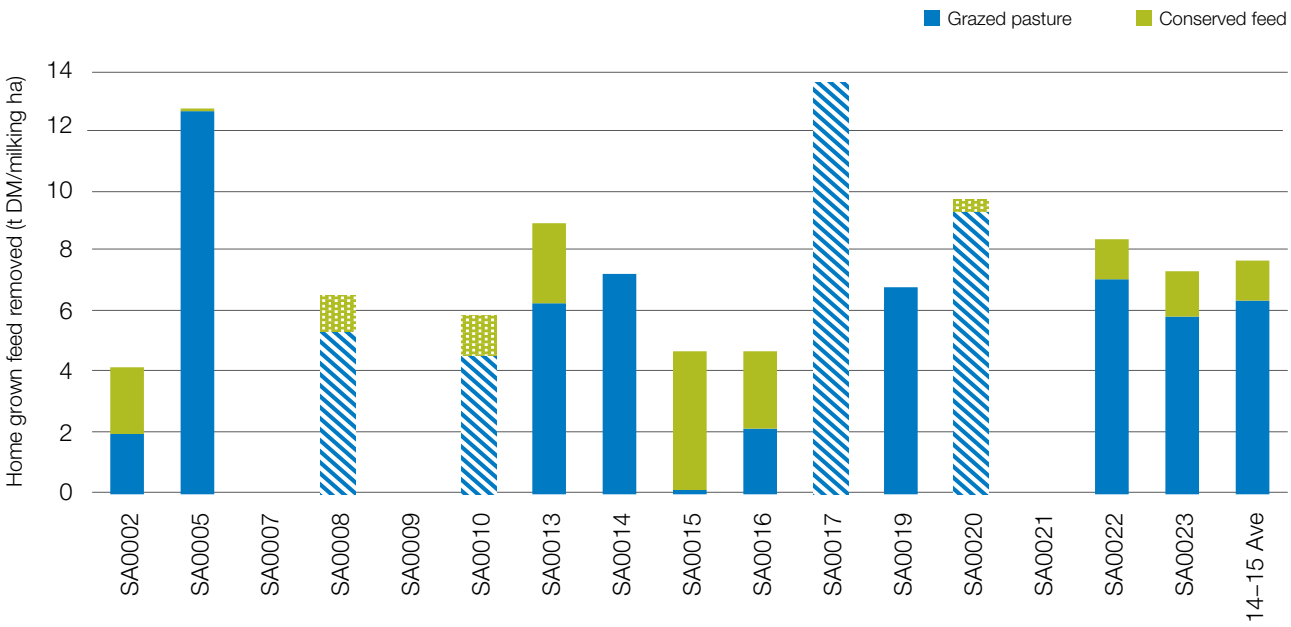


**Figure 16** Estimated tonnes of home grown feed consumed per milking hectare




More details on how pasture consumption was calculated can be found in Appendix B.

Farms SA0007 and SA0009 and SA0021 have minimal milking areas and could be considered feedlots. This feeding system is reflected in both Figures 15 and 16 where there was no grazed pasture shown.

## Fertiliser application

Dairy farms across South Australia used a wide variety of fertilisers and application rates.

Table 4 shows that the application rates of phosphorous, potassium and to some degree sulphur have been relatively consistent over the past four years of data collection.

There was a 26% increase in fertiliser application from 151.8 t/ha in 2014–15 to 191.9 t/ha in 2015–16. The notable increase was in the use of nitrogen by South Australian participant farmers. This was due to higher than usual February and May 2016 rains (coming out of a long, dry summer and autumn) that enabled dairy farmers to push grass production before the onset of winter.

The average fertiliser application compared to 2014–15 – nitrogen 121 kg/ha, a 33% increase; phosphorous 12.2 kg/ha, a 16% increase; potassium 29 kg/ha, a 6% decrease, and sulphur 29.7 kg/ha, a 52% increase.

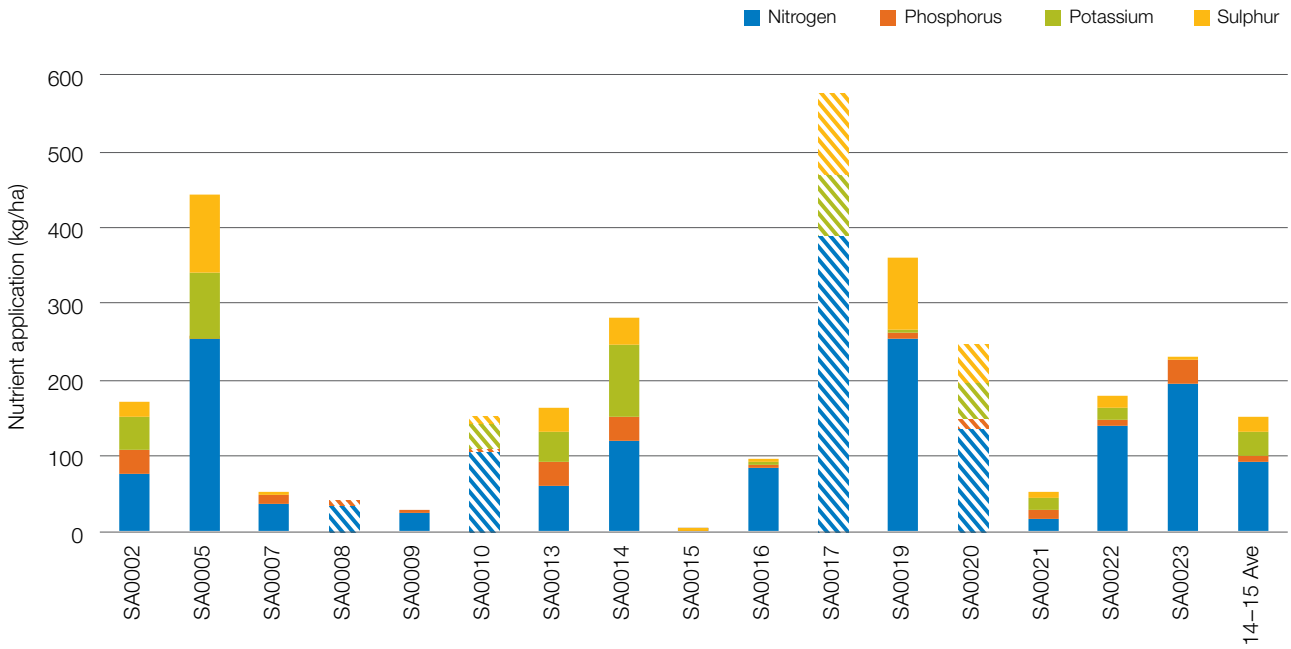
The top 25% of South Australian dairy farms (three of four were irrigated farms in 2015–16) continued to use fertiliser (particularly nitrogen) to drive pasture and conserved fodder production. Compared to the average in 2015–16, the top 25% applied an average of 166.8 kg/ha for nitrogen (138% of the average); 5.8 kg/ha phosphorous 47.5% of average); 39.8 kg/ha potassium (137% of the average) and 41.4 kg/ha sulphur (139% of the average).

Being an irrigated dairy farm is not necessarily a pre-determinant to being in the top 25%. In 2015–16, three of four top 25% were irrigated compared to 2014–15 when all the top 25% in 2014–15 were irrigated. In the 2013–14 dairy farm

**Table 4** Fertiliser use hectare

| | 2012–13 | 2013–14 | 2014–15 | 2015–16 |
|---|---|---|---|---|
| Nitrogen kg/ha | 70 | 62 | 91 | 121 |
| Phosphorus kg/ha | 11 | 10 | 11 | 12 |
| Potassium kg/ha | 32 | 27 | 31 | 29 |
| Sulphur kg/ha | 15 | 18 | 20 | 30 |

**Figure 17** Fertiliser application (kg/ha)




monitoring report only two of five in the top 25% were irrigated dairy farms.

Fertilisers used on dryland pastures were urea and diammonium phospate (DAP) which are both leading sources of nitrogen. Irrigators who elected to apply fertiliser more frequently used custom fertilisers to optimise feed growth.

Figure 17 shows the distribution of application rates used on properties. There could be other factors beyond fertiliser application that influence the production of home grown feed including soil fertility, climate and management of pastures.

The range in use of nitrogen was quite significant, ranging from 1.2 kg/ha to 390.2 kg/ha. The application rate on irrigated pastures was higher with an average of 147 kg/ha (131 kg/ha in 2014–15), range of 18 kg/ha to 390.2 kg/ha).

Phosphorous use ranged from 0 kg/ha to 31.6 kg/ha. The application rates of phosphorous on irrigated pastures were lower this year at 14.3 kg/ha (17.4 kg/ha in 2014–15), range 0 kg/ha to 31.6 kg/ha.

Potassium use ranged from 0 kg/ha to 94.5 kg/ha. The application rate of potassium on irrigated pastures was lower this year at 38.6 kg/ha (45.5 kg/ha in 2014–15), range 0 kg/ha to 94.5 kg/ha.

Sulphur use ranged from 0 kg/ha to 106.2 kg/ha. The application rates of suplhur on irrgiated pastures was lower this year at 38.8 kg/ha (45.5 kg/ha in 2014–15), ranging from 0 kg/ha to 106.2 kg/ha.

# Business confidence survey

# Expectations and issues

Responses to this business confidence survey were made in July and August 2016 with regard to the 2016–17 financial year and the next five years to 2020–21.

## Expectation for business returns

Following the 2015–16 year, expectations for the coming financial year were negative with more than 60% of dairy farmers predicting a deterioration in their business returns and less than 20% predicting an improvement. This is notably different to last year's business expectations when 35% of dairy farmers were expecting improved returns and 35% expecting no change.

Responses to the survey took into consideration all aspects of farming including climate and market conditions for all products bought and sold.

While expectations varied across all categories, participants were more negative about returns in 2016–17 as shown in Figure 18.

At the time of data collection, farmers had already received their 2016–17 milk price announcements which where much lower than in 2015–16.

Optimism for improved farm business returns came from farmers expecting to make changes to management and operating systems to increase returns.

## Price and production expectations – milk

On the basis that 2016–17 opening milk prices had been announced, 43% of dairy farmers expected their milk price for 2016–17 to increase (Figure 19), with 29% expecting milk prices to decrease and 29% to remain at similar levels to 2015–16.

Although the majority of dairy farmers expected milk prices to increase from those announced, 71% of dairy farmers did not plan to change milk production levels.

**Figure 18** Expectation of business returns

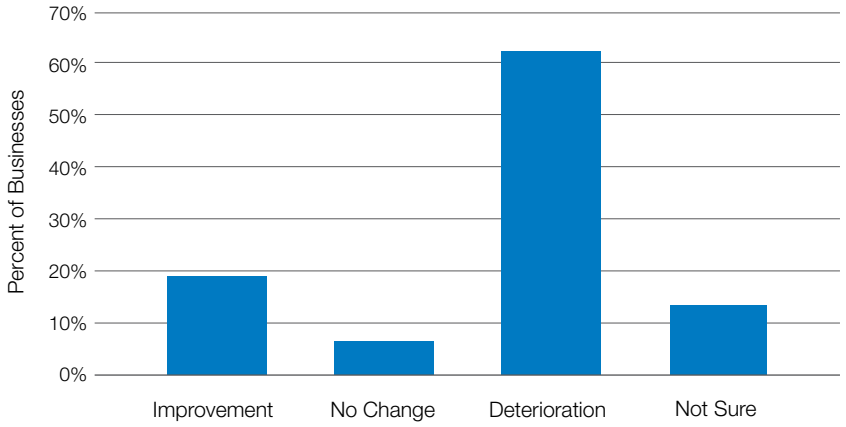
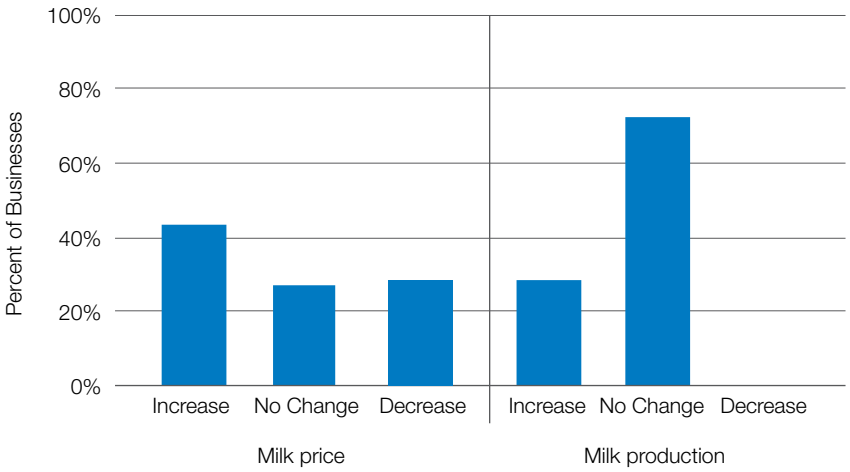


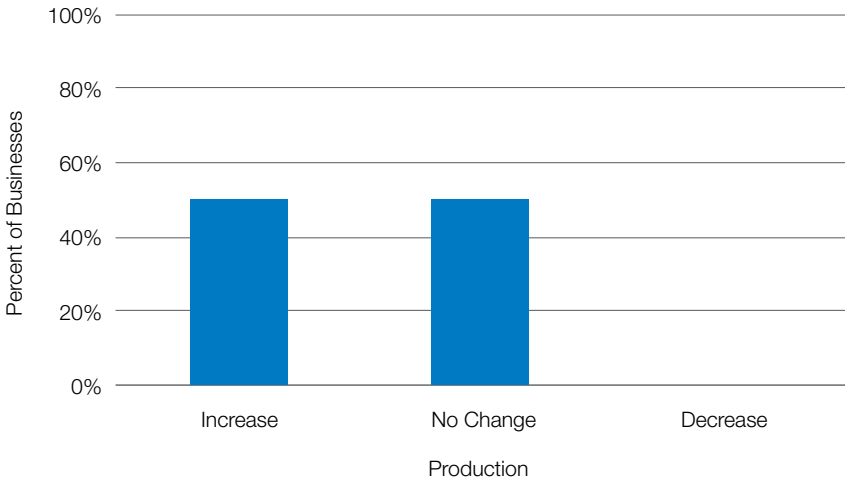

**Figure 19** Price and production expectations – milk



## Production expectations – Fodder

Participants had just come through a very tight spring 2015 and autumn 2016 with high levels of conserved feed (1.4 t DM/milking ha for the average, same as in 2014–15). An equal proportion of participants planned to increase and make no changes to fodder production for 2016–17 (Figure 20). No responses were received with regards to fodder price expectations.

**Figure 20** Production expectations – fodder

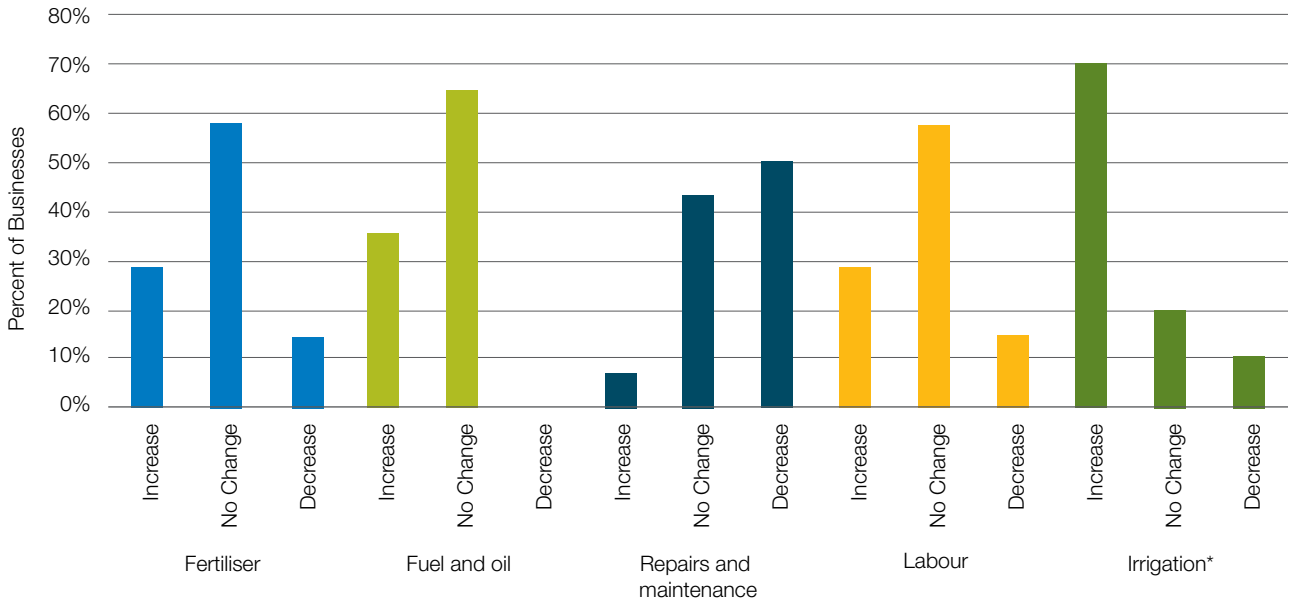



## Cost expectations

Data in Figure 21 represents the expectations of costs for the dairy industry taken from the 16 South Australian dairy farms. The majority of dairy farmers expected costs to not change for fertiliser (54%), fuel and oil (64%) and labour (57%).

Repairs and maintenance was the only cost expected to decrease (50%) and irrigation costs were the only costs expected to increase (70%). Importantly, there are a number of components to irrigation costs – incuding running costs (eg electricity) and the fixed water charges of irrigating.

**Figure 21** Cost expectations



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

A summary of the issues identified by participants for the next 12-month period is summarised in Figure 22.

Not surprisingly given the lower milk prices announced for the 2016–17 financial year, 11 of the 16 dairy farmers were concerned about milk prices (representing 31% of the 36 total responses) and the flow-on effects on their cashflow (11%) and cost of production (11%).

Only 8% of the responses this year were concerned about seasonal variability (19% in 2014–15).

Interestingly, government policy and regulation and water/irrigation issues were also raised this year, both with 8% of the responses (both not raised last year).

All other issues reported were less than 6% of the responses. This implies that dairy farmers were less concerned about issues that they can manage such as input costs, fodder production and feed prices which all rated in last year's business confidence survey.

It was also notable that farm labour did not rate as an issue for dairy farmers in 2016–17 whereas it rated with 4% of the responses in 2014–15 and 16% in 2013–14, indicating that past labour concerns are not evident going into financial year 2016–17.

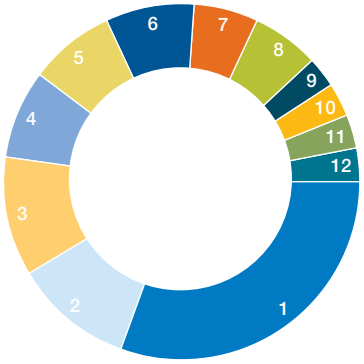



**Figure 22** Major issues facing the dairy industry – the next 12 months

1 Milk price **31%**

2 Cash flow **11%**

3 Cost of production **11%**

4 Government policy and regulation **8%**

5 Seasonal condition **8%**

6 Water **8%**

7 Electricity **6%**

8 Fodder **6%**

9 Feed management **3%**

10 Global market **3%**

11 Salinity **3%**

12 Work-life balance **3%**

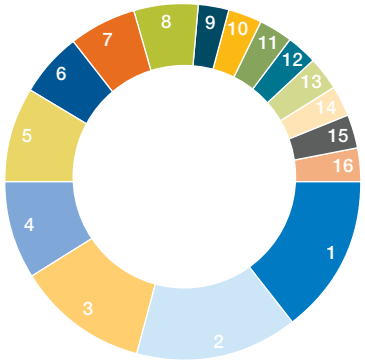



**Figure 23** Major issues facing the dairy industry – the next five years

1 Capital investment **15%**

2 Economic and political environment **15%**

3 Milk price **12%**

4 Labour **9%**

5 Water **9%**

6 Cost of production **6%**

7 Electricity **6%**

8 Input **6%**

9 Cost of production **3%**

10 Growth **3%**

11 Land prices **3%**

12 Paperwork **3%**

13 Retirement **3%**

14 Seasonal condition **3%**

15 Transitioning to new management **3%**

16 Work-life balance **3%**

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

Figure 23 shows the medium term issues identified for the next five years.

Whereas last year's business confidence survey indicated that the longer term issues were price of milk (the main concern for farmers in the next five years), followed by farm infrastructure and succession planning (accounting for 36% of all responses), this year farm infrastructure (capital development) at 15%, the economic and political outlook (15%) and milk pricing (12%) made up 42% of all responses.

Whereas seasonal variability rated for 7% of responses last year, this year respondents rated it at 3% indicating that dairy farmers are less concerned with seasonal variability going forward and that they are managing the varied seasons well.

Additionally, labour in 2014–15 had accounted for only 4% of all responses compared to 9% this year, with farmers concerned about availability and quality of labour in the medium term.

Similarly, water issues did not rate with respondents last year but 9% of the responses rated water as an issue to watch in the medium term.

These responses indicate that dairy farmers see labour management, employment and water as growing areas of concern in the next five years.

# 2015–16 Greenhouse gas emissions

# 2015–16 Greenhouse Gas Emissions

The average level of emission from participating farms was 14.1 t $CO_2$-e/t MS in 2015–16, higher than last year's 12.9 t $CO_2$-e/t MS. This year there were changes in the method of estimating greenhouse gas emissions which increased total emissions and therefore emissions intensity.

Carbon dioxide equivalents ($CO_2$-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 $CO_2$-e tonnes and expressed per tonne of milk solids produced (CO2-e/t MS).

In 2016 the method of estimating Australia's dairy industry greenhouse gas emissions (NGGI) altered to reflect new research outcomes and align with international guidelines. The GWP for the three gases that are discussed in this report have altered to 1: 25: 298 ($CO_2$: $CH_4$: $N_2O$). This means that one $CO_2$-e tonne equates to 40 kg of methane ($CH_4$) and 3.4 kg of nitrous oxide ($N_2O$). Other changes have included a decrease in the proportion of waste (dung and urine) deposited onto pastures while the milking herd graze, resulting in an increase in waste $CH_4$ and $N_2O$ emissions along with some changes to the emission factors for $N_2O$ emissions from nitrogen fertiliser and animal waste.

In addition, the estimation of greenhouse gas emissions now include a pre-farm gate emission source. This is the greenhouse gases emitted with the manufacturing of fertilisers and the production of purchased fodder, grain and concentrates. The result of these changes with the NGGI method and inclusion of pre-farm gate emissions will be an increase in emissions intensity of around 22%. This percentage increase will vary between farms in the state.

The distribution of different emissions for 2015–16 is shown in Figure 24. Greenhouse gas emissions per tonne of milk solids produced ranged from 11.8 t CO2-e/t MS to 16.3 t $CO_2$-e/t MS with an average emission level of 14.1 t $CO_2$-e/t MS. The percentage breakdown for emissions in 2015–16 was 63% for $CH_4$, 26% for $CO_2$, and 11% for $N_2O$ emissions.

Methane was identified as the main greenhouse gas emitted from dairy farms, accounting for 63%, or 8.9 t $CO_2$-e/t MS, of all greenhouse emissions. There are two main sources of $CH_4$ emissions on farm: ruminant digestion and anaerobic digestion in effluent management systems. Methane produced from ruminant digestion is known as enteric $CH_4$ and was the major source of emissions from all farms in this report, with an average of 55.4% of total emissions. Methane from effluent ponds accounted for 8% of total emissions on average across the state in 2015–16.

The most efficient strategy to reduce enteric $CH_4$ production is manipulating the diet by increasing the feed quality through improved pastures or supplementation with particular concentrates. Adding fat supplements such as whole cotton seed, canola meal or linseed oil into the diet can also reduce $CH_4$ 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.

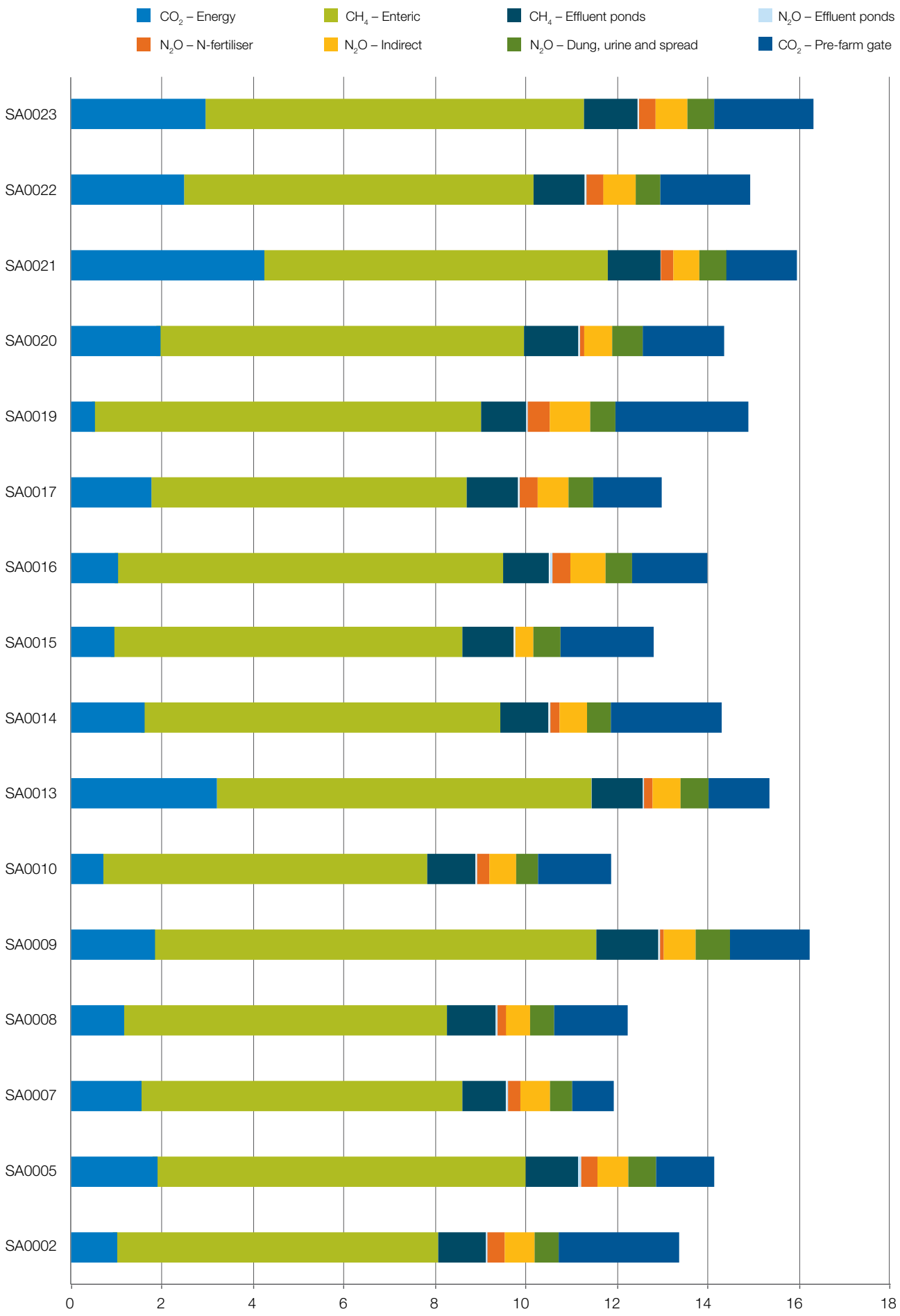
The second main greenhouse gas emission was $CO_2$ being produced primarily from fossil fuel consumption as either electricity or petrochemicals. The NGGI calculates carbon emissions from both pre-farm gates and on-farm sources. Carbon dioxide accounted for 25.8% of total emissions (3.7 t $CO_2$-e/t MS); 13.1% from pre-farm gates sources and 12.7% from on-farm energy sources. Output levels were highly dependent on the source of electricity used with farms using brown coal generated electricity and electricity sourced from renewable sources (eg solar). There are a number of technologies available to improve energy efficiency in the dairy while reducing electricity costs.

The third main greenhouse gas emission was nitrous oxide, accounting for 11% of total emissions or 1.5 t $CO_2$-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% of total emissions, effluent ponds accounted for 0.2% and excreta accounted for 4.2%. Nitrous oxide from indirect emissions was 4.4%. 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 $N_2O$. Strategic fertiliser management practices can reduce $N_2O$ emissions and improve nitrogen efficiency.

There is a growing importance to understand and monitor 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 Department of the Environment's website at environment.gov.au/climate-change

**Figure 24** Greenhouse gas emissions per tonne of milk solids produced



# Historical analysis

# Historical analysis

This section compares the performance of participant farms in the Dairy Farm Monitor Project over the past four years. While figures are adjusted for inflation to allow comparison between years it should be noted that there were three new farms in 2013–14, one in 2014–15 and three new farms in 2015–16.

As can be seen in Figure 25, the average EBIT and net farm income have risen for all farms from 2012–13 to 2013–14 before beginning a downward trend in 2014–15. This trend has continued in 2015–16.

Historically, the low EBIT of 2012–13 was primarily due to low milk prices received (average of $6.15/kg MS (adjusted for inflation), an early finish to the spring and the growing season with low levels of pasture grown and grazed caused an increase in feed cost. In 2012–13, feed costs accounted for 83% of total variable costs

In 2013–14, EBIT and net farm income rose as a result of good average milk prices received $7.00/kg MS (adjusted for inflation), and an improved pasture growing season (average 7.9 t DM/ha estimated pasture grazed in 2013–14).

In 2014–15, EBIT and Net Farm Income declined as a result of lower average milk prices received – average milk price of $6.42/kg MS in 2014–15 was 8.4% lower than the $7.00/kg MS received in 2013–14 (adjusted for inflation).

2015–16 continued the downward trend in EBIT and Net Farm Income with average milk prices of $6.15/kg MS (4.2% lower than 2014–15) being a major contributor.

Return on assets has dropped to an average of 3.1% which is now the new four-year average (3.9% as the average from 2012–13 to 2014–15). This followed a high of 6.2% return on assets in 2013–14 and a low of -0.6% in 2012–13.

The average return on equity in 2015–16 fell to -1.5% (from 3.6% in 2014–15), as seen in Figure 26.

A -1.5% RoE, indicates that the average South Australian dairy farming business (at 3.1% RoA) has insufficient EBIT to cover the cost of borrowings and/or lease repayments to be able to return a profit to the owners' capital.

**Figure 25** Historical EBIT and net farm income

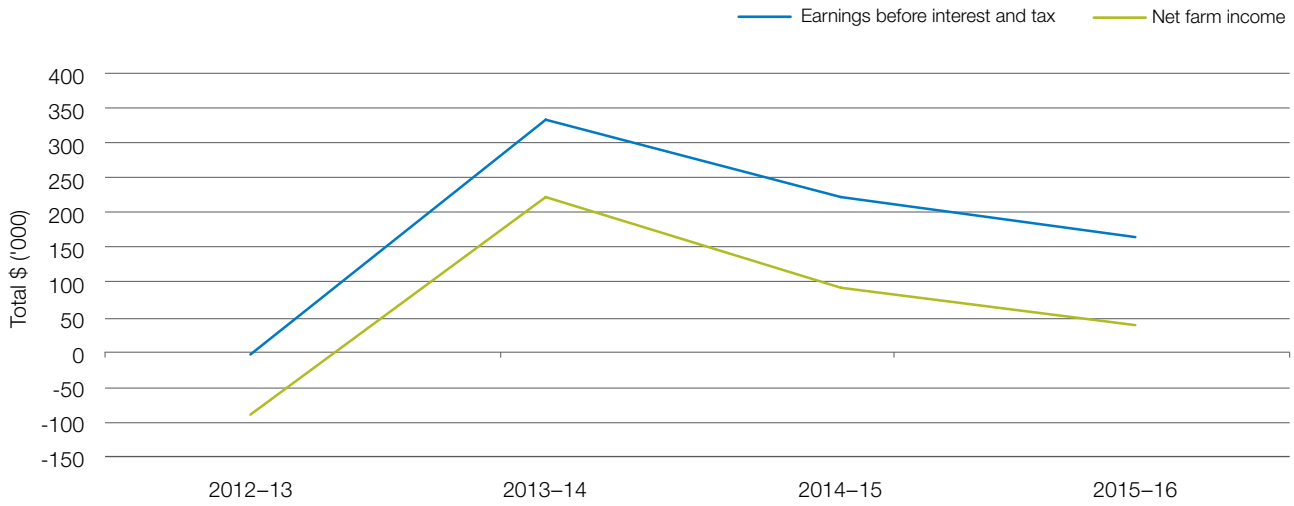
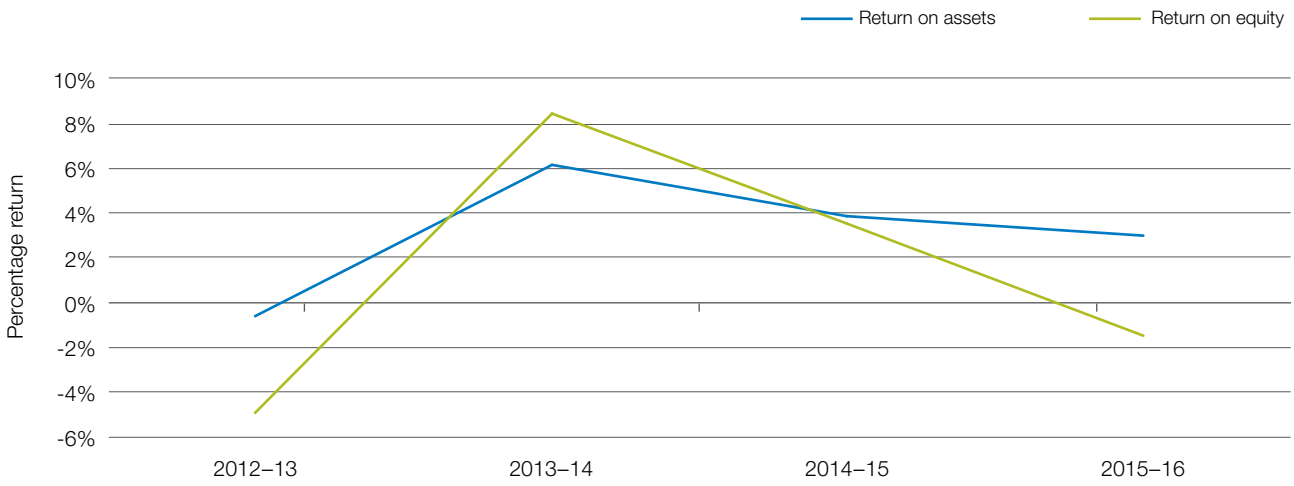



**Figure 26** Historical return on assets and return on equity



# 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 & Tax | Return on assets (excl. capital apprec.) | Interest & 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 | % | % |
| SA0002 | $6.32 | $0.76 | $7.07 | $3.85 | $2.77 | 58% | $0.45 | 2.2% | $0.05 | 1% | $0.39 | 2.3% | 2.3% |
| SA0005 | $5.46 | $0.72 | $6.18 | $2.85 | $2.46 | 54% | $0.88 | 3.9% | $0.00 | 0% | $0.88 | 3.9% | 3.9% |
| SA0007 | $6.67 | $1.52 | $8.20 | $4.38 | $2.79 | 61% | $1.02 | 3.1% | $0.77 | 9% | $0.25 | 1.2% | 1.3% |
| ***SA0008*** | ***$6.55*** | ***$0.89*** | ***$7.44*** | ***$2.60*** | ***$2.31*** | ***53%*** | ***$2.53*** | ***7.9%*** | ***$0.45*** | ***6%*** | ***$2.07*** | ***7.8%*** | ***-0.6%*** |
| SA0009 | $6.77 | $1.32 | $8.09 | $3.56 | $5.80 | 38% | -$1.27 | -1.9% | $0.63 | 8% | -$1.90 | -3.4% | -3.4% |
| ***SA0010*** | ***$6.13*** | ***$0.69*** | ***$6.82*** | ***$2.94*** | ***$2.04*** | ***59%*** | ***$1.84*** | ***5.6%*** | ***$1.01*** | ***15%*** | ***$0.84*** | ***4.6%*** | ***5.0%*** |
| SA0013 | $6.55 | $0.90 | $7.44 | $2.68 | $2.83 | 49% | $1.94 | 5.0% | $0.12 | 2% | $1.82 | 5.3% | 5.0% |
| SA0014 | $6.01 | $0.56 | $6.57 | $4.21 | $1.92 | 69% | $0.44 | 3.2% | $0.56 | 9% | -$0.12 | -27.6% | -25.8% |
| SA0015 | $6.62 | $1.57 | $8.19 | $5.24 | $2.72 | 66% | $0.24 | 1.2% | $0.39 | 5% | -$0.15 | -1.1% | -1.1% |
| SA0016 | $6.25 | $2.08 | $8.33 | $4.06 | $2.36 | 63% | $1.90 | 5.2% | $0.75 | 9% | $1.16 | 6.2% | 6.7% |
| ***SA0017*** | ***$5.36*** | ***$0.60*** | ***$5.95*** | ***$2.86*** | ***$1.78*** | ***62%*** | ***$1.31*** | ***5.9%*** | ***$0.14*** | ***2%*** | ***$1.17*** | ***6.8%*** | ***6.8%*** |
| SA0019 | $5.88 | $0.62 | $6.50 | $4.42 | $1.76 | 72% | $0.31 | 1.7% | $1.17 | 18% | -$0.86 | -17.7% | -17.1% |
| ***SA0020*** | ***$5.64*** | ***$0.42*** | ***$6.06*** | ***$3.55*** | ***$1.46*** | ***71%*** | ***$1.05*** | ***5.5%*** | ***$0.61*** | ***10%*** | ***$0.44*** | ***4.6%*** | ***4.5%*** |
| SA0021 | $6.29 | $0.77 | $7.06 | $4.51 | $3.66 | 55% | -$1.10 | -3.6% | $0.74 | 10% | -$1.84 | -9.8% | -7.7% |
| SA0022 | $5.77 | $1.32 | $7.09 | $3.75 | $2.44 | 61% | $0.90 | 3.2% | $0.94 | 13% | -$0.04 | -0.4% | -1.9% |
| SA0023 | $6.09 | $0.53 | $6.62 | $3.83 | $2.55 | 60% | $0.24 | 1.0% | $0.84 | 13% | -$0.60 | -6.7% | -6.7% |
| **Average** | **$6.15** | **$0.95** | **$7.10** | **$3.71** | **$2.60** | **59%** | **$0.79** | **3.1%** | **$0.57** | **8%** | **$0.22** | **-1.5%** | **-1.8%** |
| **Top 25%*** | **$5.92** | **$0.65** | **$6.57** | **$2.99** | **$1.90** | **61%** | **$1.68** | **6.2%** | **$0.55** | **8%** | **$1.13** | **6.0%** | **3.9%** |

** Top 25% are bold and italicised*

**Table A2** Physical information

| Farm number | Total usable area | Milking area | Water used | Number of milking cows | Milking cows per usable area | Milk sold | Milk sold | Fat | Protein |
|---|---|---|---|---|---|---|---|---|---|
| | ha | ha | mm/ha | hd | hd/ha | kg MS/ cow | kg MS/ ha | % | % |
| SA0002 | 532 | 250 | 549 | 300 | 0.6 | 641 | 362 | 3.9% | 3.3% |
| SA0005 | 176 | 171 | 1,118 | 560 | 3.2 | 454 | 1,446 | 4.6% | 3.5% |
| SA0007 | 691 | 9 | 398 | 223 | 0.3 | 711 | 230 | 3.9% | 3.1% |
| ***SA0008*** | ***444*** | ***84*** | ***513*** | ***200*** | ***0.5*** | ***666*** | ***300*** | ***4.2%*** | ***3.3%*** |
| SA0009 | 69 | 1 | 448 | 102 | 1.5 | 346 | 516 | 5.1% | 3.8% |
| ***SA0010*** | **252** | **208** | **786** | **287** | **1.1** | **595** | **678** | **4.2%** | **3.4%** |
| SA0013 | 340 | 194 | 1,006 | 348 | 1.0 | 547 | 560 | 3.9% | 3.3% |
| SA0014 | 211 | 152 | 848 | 410 | 1.9 | 565 | 1,098 | 4.0% | 3.4% |
| SA0015 | 314 | 100 | 473 | 225 | 0.7 | 573 | 411 | 3.9% | 3.2% |
| SA0016 | 605 | 103 | 648 | 320 | 0.5 | 708 | 374 | 3.6% | 3.3% |
| ***SA0017*** | ***126*** | ***123*** | ***1,309*** | ***420*** | ***3.3*** | ***522*** | ***1,739*** | ***4.5%*** | ***3.7%*** |
| SA0019 | 365 | 210 | 842 | 550 | 1.5 | 651 | 980 | 3.6% | 3.1% |
| ***SA0020*** | ***155*** | ***121*** | ***1,194*** | ***415*** | ***2.7*** | ***589*** | ***1,577*** | ***3.8%*** | ***3.4%*** |
| SA0021 | 2,225 | 2 | 418 | 552 | 0.2 | 550 | 137 | 3.8% | 3.2% |
| SA0022 | 430 | 150 | 815 | 460 | 1.1 | 601 | 643 | 3.4% | 3.5% |
| SA0023 | 210 | 210 | 1,069 | 310 | 1.5 | 654 | 966 | 2.9% | 3.2% |
| **Average** | **447** | **131** | **777** | **355** | **1.4** | **586** | **751** | **4.0%** | **3.4%** |
| **Top 25%*** | **244** | **134** | **951** | **331** | **1.9** | **593** | **1,074** | **4.2%** | **3.4%** |

** 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 |
| SA0002 | 2.0 | 2.3 | 48% | 77.9 | 30.8 | 42.9 | 21.3 | 64 | 40,931 |
| SA0005 | 12.7 | 0.1 | 80% | 253.5 | 2.5 | 86.5 | 99.7 | 164 | 74,450 |
| SA0007 | | | 27% | 37.2 | 12.5 | 0.0 | 0.2 | 56 | 39,715 |
| ***SA0008*** | ***5.4*** | ***1.2*** | ***67%*** | ***35.5*** | ***5.9*** | ***0.0*** | ***0.0*** | ***78*** | ***51,741*** |
| SA0009 | | | 32% | 24.4 | 5.9 | 0.0 | 0.0 | 54 | 18,753 |
| ***SA0010*** | ***4.6*** | ***1.3*** | ***65%*** | ***105.6*** | ***4.5*** | ***32.4*** | ***9.8*** | ***105*** | ***62,309*** |
| SA0013 | 6.3 | 2.7 | 75% | 62.6 | 28.3 | 41.4 | 31.5 | 73 | 39,784 |
| SA0014 | 7.3 | 0.0 | 37% | 119.5 | 31.6 | 94.5 | 34.2 | 90 | 50,862 |
| SA0015 | 0.2 | 4.6 | 27% | 1.2 | 1.4 | 0.0 | 0.1 | 88 | 50,401 |
| SA0016 | 2.2 | 2.6 | 46% | 84.5 | 5.8 | 2.6 | 1.4 | 67 | 47,228 |
| ***SA0017*** | ***13.7*** | ***0.0*** | ***71%*** | ***390.2*** | ***0.0*** | ***79.4*** | ***106.2*** | ***130*** | ***67,706*** |
| SA0019 | 6.8 | 0.0 | 46% | 253.8 | 7.0 | 4.7 | 96.6 | 78 | 50,490 |
| ***SA0020*** | ***9.4*** | ***0.4*** | ***49%*** | ***136.1*** | ***12.8*** | ***47.6*** | ***49.5*** | ***138*** | ***81,502*** |
| SA0021 | | | 0% | 18.6 | 10.5 | 14.3 | 8.0 | 86 | 47,455 |
| SA0022 | 7.1 | 1.3 | 49% | 138.7 | 7.5 | 17.4 | 14.5 | 67 | 40,069 |
| SA0023 | 5.9 | 1.5 | 54% | 196.6 | 28.6 | 0.0 | 2.2 | 73 | 47,817 |
| **Average** | **6.4** | **1.4** | **48%** | **121.0** | **12.2** | **29.0** | **29.7** | **88** | **50,701** |
| **Top 25%*** | **8.3** | **0.7** | **63%** | **166.8** | **5.8** | **39.8** | **41.4** | **113** | **65,815** |

** The Top 25% are bold and italicised.*
***on milking 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 |
| SA0002 | 4.1 | $467 | $135 | $247 | | $381 | 11.3 | 3.5 | 52% |
| SA0005 | 1.0 | $351 | | $236 | | $327 | 12.3 | 2.8 | 20% |
| SA0007 | 4.2 | $637 | | $94 | $217 | $272 | 11.0 | 2.6 | 73% |
| ***SA0008*** | ***2.8*** | ***$304*** | | | | ***$304*** | ***12.3*** | ***2.5*** | ***33%*** |
| SA0009 | 2.9 | $348 | | $94 | $58 | $202 | 11.2 | 1.8 | 68% |
| ***SA0010*** | ***2.5*** | ***$407*** | | ***$239*** | ***$1,114*** | ***$364*** | ***11.6*** | ***3.3*** | ***35%*** |
| SA0013 | 1.6 | $320 | | $249 | | $314 | 13.2 | 2.4 | 25% |
| SA0014 | 4.0 | $364 | $166 | $289 | $545 | $300 | 11.4 | 2.8 | 63% |
| SA0015 | 6.1 | $360 | | $238 | $197 | $264 | 11.5 | 2.6 | 73% |
| SA0016 | 4.8 | $258 | | $275 | $232 | $254 | 12.2 | 2.1 | 54% |
| ***SA0017*** | ***1.3*** | ***$299*** | ***$486*** | ***$171*** | | ***$286*** | ***11.8*** | ***2.5*** | ***29%*** |
| SA0019 | 4.3 | $338 | | $227 | $802 | $300 | 11.4 | 2.8 | 54% |
| ***SA0020*** | ***3.2*** | ***$344*** | | ***$251*** | | ***$313*** | ***11.8*** | ***2.8*** | ***51%*** |
| SA0021 | 7.1 | $351 | | $226 | $80 | $139 | 11.6 | 1.3 | 100% |
| SA0022 | 2.9 | $351 | | $162 | | $349 | 13.0 | 2.7 | 51% |
| SA0023 | 3.7 | $365 | | $259 | | $343 | 12.3 | 2.9 | 46% |
| **Average** | **3.5** | **$366** | **$262** | **$217** | **$406** | **$294** | **11.9** | **2.6** | **52%** |
| **Top 25%*** | **2.5** | **$339** | | | | **$317** | **11.9** | **2.8** | **37%** |

** 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 & 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 |
| SA0002 | $0.09 | $0.14 | $0.00 | $0.12 | $0.06 | $0.41 | $0.42 | $0.02 | $0.13 |
| SA0005 | $0.11 | $0.35 | $0.00 | $0.09 | $0.04 | $0.58 | $0.46 | $0.01 | $0.02 |
| SA0007 | $0.11 | $0.12 | $0.00 | $0.11 | $0.11 | $0.45 | $0.23 | $0.00 | $0.77 |
| ***SA0008*** | ***$0.12*** | ***$0.08*** | ***$0.00*** | ***$0.12*** | ***$0.06*** | ***$0.38*** | ***$0.18*** | ***$0.14*** | ***$0.14*** |
| SA0009 | $0.17 | $0.11 | $0.02 | $0.27 | $0.07 | $0.64 | $0.09 | $0.01 | $0.03 |
| ***SA0010*** | ***$0.10*** | ***$0.20*** | ***$0.00*** | ***$0.11*** | ***$0.10*** | ***$0.51*** | ***$0.40*** | ***$0.00*** | ***$0.06*** |
| SA0013 | $0.16 | $0.10 | $0.04 | $0.08 | $0.05 | $0.42 | $0.46 | $0.40 | $0.00 |
| SA0014 | $0.13 | $0.20 | $0.02 | $0.10 | $0.24 | $0.69 | $0.37 | $0.24 | $0.00 |
| SA0015 | $0.32 | $0.09 | $0.00 | $0.15 | $0.23 | $0.79 | $0.00 | $0.00 | $0.00 |
| SA0016 | $0.26 | $0.19 | $0.03 | $0.07 | $0.10 | $0.65 | $0.32 | $0.00 | $0.29 |
| ***SA0017*** | ***$0.10*** | ***$0.13*** | ***$0.04*** | ***$0.36*** | ***$0.00*** | ***$0.64*** | ***$0.53*** | ***$0.25*** | ***$0.00*** |
| SA0019 | $0.08 | $0.21 | $0.14 | $0.13 | $0.16 | $0.73 | $0.63 | $0.12 | $0.31 |
| ***SA0020*** | ***$0.08*** | ***$0.18*** | ***$0.01*** | ***$0.10*** | ***$0.02*** | ***$0.39*** | ***$0.45*** | ***$0.23*** | ***$0.06*** |
| SA0021 | $0.21 | $0.15 | $0.13 | $0.14 | $0.09 | $0.72 | $0.65 | $0.02 | $0.62 |
| SA0022 | $0.17 | $0.13 | $0.02 | $0.14 | $0.08 | $0.55 | $0.48 | $0.14 | $0.25 |
| SA0023 | $0.08 | $0.26 | $0.04 | $0.11 | $0.15 | $0.64 | $0.31 | $0.23 | $0.12 |
| **Average** | **$0.14** | **$0.17** | **$0.03** | **$0.14** | **$0.10** | **$0.57** | **$0.37** | **$0.11** | **$0.17** |
| **Top 25%*** | **$0.10** | **$0.15** | **$0.01** | **$0.17** | **$0.05** | **$0.48** | **$0.39** | **$0.16** | **$0.07** |

** 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 |
| SA0002 | $0.14 | $0.16 | $0.01 | $0.53 | $2.03 | $0.00 | $3.44 | $3.85 |
| SA0005 | $0.41 | $0.07 | $0.03 | $0.11 | $0.64 | $0.50 | $2.27 | $2.85 |
| SA0007 | $0.24 | $0.66 | $0.37 | $0.02 | $1.65 | $0.00 | $3.93 | $4.38 |
| ***SA0008*** | ***$0.12*** | ***$0.20*** | ***$0.07*** | ***$0.00*** | ***$1.36*** | ***$0.00*** | ***$2.22*** | ***$2.60*** |
| SA0009 | $0.25 | $0.12 | $0.04 | $0.06 | $2.12 | $0.20 | $2.92 | $3.56 |
| ***SA0010*** | ***$0.09*** | ***$0.12*** | ***$0.13*** | ***$0.49*** | ***$1.13*** | ***$0.00*** | ***$2.43*** | ***$2.94*** |
| SA0013 | $0.04 | $0.36 | $0.03 | $0.09 | $0.88 | $0.00 | $2.25 | $2.68 |
| SA0014 | $0.07 | $0.18 | $0.00 | $0.87 | $1.56 | $0.23 | $3.52 | $4.21 |
| SA0015 | $0.08 | $0.83 | $0.32 | $0.91 | $2.07 | $0.25 | $4.45 | $5.24 |
| SA0016 | $0.14 | $0.32 | $0.41 | $0.42 | $1.50 | $0.00 | $3.41 | $4.06 |
| ***SA0017*** | ***$0.04*** | ***$0.09*** | ***$0.11*** | ***$0.21*** | ***$0.59*** | ***$0.41*** | ***$2.22*** | ***$2.86*** |
| SA0019 | $0.27 | $0.14 | $0.13 | $0.60 | $1.50 | $0.00 | $3.70 | $4.42 |
| ***SA0020*** | ***$0.03*** | ***$0.18*** | ***$0.14*** | ***$0.48*** | ***$1.28*** | ***$0.33*** | ***$3.16*** | ***$3.55*** |
| SA0021 | $0.20 | $0.00 | $0.42 | $0.12 | $1.76 | $0.01 | $3.79 | $4.51 |
| SA0022 | $0.03 | $0.34 | $0.26 | $0.01 | $1.69 | $0.00 | $3.20 | $3.75 |
| SA0023 | $0.20 | $0.04 | $0.25 | $0.34 | $1.64 | $0.06 | $3.19 | $3.83 |
| **Average** | **$0.15** | **$0.24** | **$0.17** | **$0.33** | **$1.46** | **$0.12** | **$3.13** | **$3.71** |
| **Top 25%*** | **$0.07** | **$0.15** | **$0.11** | **$0.29** | **$1.09** | **$0.18** | **$2.51** | **$2.99** |

** 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 & 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 |
| SA0002 | $0.07 | $0.01 | $0.09 | $0.46 | $0.00 | $0.06 | $1.26 | $1.95 | $0.18 | $0.64 | $2.77 |
| SA0005 | $0.03 | $0.00 | $0.07 | $0.44 | $0.00 | $0.28 | $1.18 | $2.01 | $0.45 | $0.00 | $2.46 |
| SA0007 | $0.06 | $0.02 | $0.17 | $0.63 | $0.01 | $0.20 | $0.63 | $1.72 | $0.44 | $0.64 | $2.79 |
| ***SA0008*** | ***$0.09*** | ***$0.02*** | ***$0.06*** | ***$0.27*** | ***$0.00*** | ***$0.15*** | ***$0.40*** | ***$0.99*** | ***$0.42*** | ***$0.89*** | ***$2.31*** |
| SA0009 | $0.10 | $0.21 | $0.00 | $0.61 | $0.08 | $0.33 | $1.32 | $2.64 | $0.69 | $2.47 | $5.80 |
| ***SA0010*** | ***$0.08*** | ***$0.00*** | ***$0.07*** | ***$0.35*** | ***$0.01*** | ***$0.09*** | ***$0.66*** | ***$1.27*** | ***$0.28*** | ***$0.49*** | ***$2.04*** |
| SA0013 | $0.05 | $0.06 | $0.06 | $0.47 | $0.03 | $0.22 | $0.44 | $1.33 | $0.23 | $1.27 | $2.83 |
| SA0014 | $0.00 | $0.04 | $0.00 | $0.28 | $0.00 | $0.24 | $0.88 | $1.43 | $0.08 | $0.41 | $1.92 |
| SA0015 | $0.06 | $0.03 | $0.10 | $0.52 | $0.01 | $0.52 | $0.04 | $1.28 | $0.14 | $1.29 | $2.72 |
| SA0016 | $0.08 | $0.01 | $0.11 | $0.33 | $0.00 | $0.07 | $0.94 | $1.54 | $0.53 | $0.30 | $2.36 |
| ***SA0017*** | ***$0.04*** | ***$0.01*** | ***$0.04*** | ***$0.32*** | ***$0.00*** | ***$0.12*** | ***$0.83*** | ***$1.36*** | ***$0.43*** | ***$0.00*** | ***$1.78*** |
| SA0019 | $0.04 | $0.01 | $0.04 | $0.28 | $0.00 | $0.06 | $0.79 | $1.22 | $0.19 | $0.36 | $1.76 |
| ***SA0020*** | ***$0.00*** | ***$0.11*** | ***$0.00*** | ***$0.22*** | ***$0.00*** | ***$0.29*** | ***$0.73*** | ***$1.36*** | ***$0.10*** | ***$0.00*** | ***$1.46*** |
| SA0021 | $0.06 | $0.02 | $0.13 | $0.71 | $0.01 | $0.22 | $1.03 | $2.17 | $1.04 | $0.44 | $3.66 |
| SA0022 | $0.03 | $0.00 | $0.05 | $0.40 | $0.01 | $0.22 | $1.02 | $1.73 | $0.16 | $0.55 | $2.44 |
| SA0023 | $0.04 | $0.00 | $0.12 | $0.48 | $0.03 | $0.40 | $0.59 | $1.67 | $0.08 | $0.80 | $2.55 |
| **Average** | **$0.05** | **$0.03** | **$0.07** | **$0.42** | **$0.01** | **$0.22** | **$0.80** | **$1.60** | **$0.34** | **$0.66** | **$2.60** |
| **Top 25%*** | **$0.05** | **$0.03** | **$0.04** | **$0.29** | **$0.00** | **$0.16** | **$0.66** | **$1.24** | **$0.31** | **$0.35** | **$1.90** |

** 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 |
| SA0002 | 1.4% | 2.1% | 0.0% | 1.8% | 0.9% | 6.2% | 6.4% | 0.3% | 2.0% |
| SA0005 | 2.1% | 6.5% | 0.0% | 1.7% | 0.7% | 11.0% | 8.7% | 0.2% | 0.4% |
| SA0007 | 1.5% | 1.7% | 0.0% | 1.5% | 1.6% | 6.3% | 3.2% | 0.0% | 10.7% |
| ***SA0008*** | ***2.4%*** | ***1.6%*** | ***0.0%*** | ***2.4%*** | ***1.3%*** | ***7.7%*** | ***3.7%*** | ***2.9%*** | ***2.9%*** |
| SA0009 | 1.8% | 1.1% | 0.2% | 2.9% | 0.8% | 6.8% | 0.9% | 0.1% | 0.3% |
| ***SA0010*** | ***2.0%*** | ***4.0%*** | ***0.0%*** | ***2.2%*** | ***2.1%*** | ***10.3%*** | ***8.0%*** | ***0.0%*** | ***1.3%*** |
| SA0013 | 2.8% | 1.9% | 0.6% | 1.4% | 1.0% | 7.7% | 8.4% | 7.2% | 0.0% |
| SA0014 | 2.1% | 3.3% | 0.3% | 1.6% | 3.9% | 11.2% | 6.0% | 3.9% | 0.0% |
| SA0015 | 4.0% | 1.1% | 0.0% | 1.9% | 2.9% | 9.9% | 0.0% | 0.0% | 0.0% |
| SA0016 | 4.0% | 3.0% | 0.5% | 1.0% | 1.5% | 10.1% | 5.0% | 0.1% | 4.4% |
| ***SA0017*** | ***2.2%*** | ***2.9%*** | ***0.8%*** | ***7.8%*** | ***0.0%*** | ***13.7%*** | ***11.3%*** | ***5.5%*** | ***0.0%*** |
| SA0019 | 1.3% | 3.5% | 2.2% | 2.2% | 2.6% | 11.8% | 10.1% | 2.0% | 5.0% |
| ***SA0020*** | ***1.7%*** | ***3.6%*** | ***0.2%*** | ***1.9%*** | ***0.5%*** | ***7.8%*** | ***8.9%*** | ***4.7%*** | ***1.2%*** |
| SA0021 | 2.6% | 1.8% | 1.6% | 1.7% | 1.1% | 8.8% | 8.0% | 0.2% | 7.5% |
| SA0022 | 2.8% | 2.1% | 0.3% | 2.3% | 1.4% | 8.9% | 7.7% | 2.3% | 4.1% |
| SA0023 | 1.3% | 4.1% | 0.6% | 1.7% | 2.4% | 10.1% | 4.9% | 3.6% | 1.9% |
| **Average** | **2.3%** | **2.8%** | **0.5%** | **2.2%** | **1.5%** | **9.3%** | **6.3%** | **2.1%** | **2.6%** |
| **Top 25%*** | **2.1%** | **3.0%** | **0.2%** | **3.6%** | **1.0%** | **9.9%** | **8.0%** | **3.3%** | **1.3%** |

** 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 |
| SA0002 | 2.2% | 2.4% | 0.1% | 7.9% | 30.6% | 0.0% | 51.9% | 58.1% |
| SA0005 | 7.8% | 1.4% | 0.6% | 2.2% | 12.1% | 9.5% | 42.7% | 53.7% |
| SA0007 | 3.3% | 9.2% | 5.1% | 0.3% | 23.0% | 0.0% | 54.8% | 61.0% |
| ***SA0008*** | ***2.5%*** | ***4.2%*** | ***1.4%*** | ***0.0%*** | ***27.8%*** | ***0.0%*** | ***45.3%*** | ***53.0%*** |
| SA0009 | 2.7% | 1.3% | 0.5% | 0.7% | 22.7% | 2.1% | 31.2% | 38.0% |
| ***SA0010*** | ***1.9%*** | ***2.4%*** | ***2.7%*** | ***9.9%*** | ***22.8%*** | ***0.0%*** | ***48.8%*** | ***59.1%*** |
| SA0013 | 0.7% | 6.6% | 0.5% | 1.7% | 15.9% | 0.0% | 40.9% | 48.6% |
| SA0014 | 1.1% | 3.0% | 0.0% | 14.1% | 25.5% | 3.7% | 57.4% | 68.6% |
| SA0015 | 1.0% | 10.5% | 4.0% | 11.4% | 26.0% | 3.1% | 56.0% | 65.9% |
| SA0016 | 2.1% | 5.0% | 6.5% | 6.6% | 23.4% | 0.0% | 53.1% | 63.2% |
| ***SA0017*** | ***0.8%*** | ***2.0%*** | ***2.4%*** | ***4.5%*** | ***12.6%*** | ***8.8%*** | ***47.9%*** | ***61.6%*** |
| SA0019 | 4.4% | 2.3% | 2.1% | 9.7% | 24.2% | 0.0% | 59.7% | 71.5% |
| ***SA0020*** | ***0.6%*** | ***3.6%*** | ***2.7%*** | ***9.6%*** | ***25.5%*** | ***6.5%*** | ***63.1%*** | ***70.9%*** |
| SA0021 | 2.5% | 0.0% | 5.1% | 1.4% | 21.6% | 0.1% | 46.4% | 55.2% |
| SA0022 | 0.4% | 5.6% | 4.2% | 0.1% | 27.3% | 0.0% | 51.7% | 60.6% |
| SA0023 | 3.1% | 0.7% | 3.9% | 5.3% | 25.7% | 1.0% | 50.0% | 60.1% |
| **Average** | **2.3%** | **3.8%** | **2.6%** | **5.3%** | **22.9%** | **2.2%** | **50.1%** | **59.3%** |
| **Top 25%*** | **1.4%** | **3.0%** | **2.3%** | **6.0%** | **22.2%** | **3.8%** | **51.3%** | **61.2%** |

** 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 |
| SA0002 | 1.1% | 0.2% | 1.3% | 7.0% | 0.0% | 0.9% | 18.9% | 29.5% | 2.7% | 9.7% | 41.9% |
| SA0005 | 0.5% | 0.0% | 1.3% | 8.4% | 0.0% | 5.3% | 22.3% | 37.9% | 8.4% | 0.0% | 46.3% |
| SA0007 | 0.9% | 0.3% | 2.3% | 8.7% | 0.1% | 2.8% | 8.8% | 23.9% | 6.2% | 8.9% | 39.0% |
| ***SA0008*** | ***1.8%*** | ***0.3%*** | ***1.1%*** | ***5.6%*** | ***0.1%*** | ***3.0%*** | ***8.2%*** | ***20.1%*** | ***8.7%*** | ***18.2%*** | ***47.0%*** |
| SA0009 | 1.0% | 2.2% | 0.0% | 6.5% | 0.8% | 3.5% | 14.1% | 28.2% | 7.4% | 26.4% | 62.0% |
| ***SA0010*** | ***1.7%*** | ***0.0%*** | ***1.3%*** | ***7.1%*** | ***0.2%*** | ***1.9%*** | ***13.3%*** | ***25.5%*** | ***5.7%*** | ***9.8%*** | ***40.9%*** |
| SA0013 | 1.0% | 1.1% | 1.0% | 8.4% | 0.6% | 4.0% | 8.0% | 24.2% | 4.1% | 23.1% | 51.4% |
| SA0014 | 0.0% | 0.7% | 0.0% | 4.5% | 0.0% | 3.8% | 14.3% | 23.4% | 1.4% | 6.6% | 31.4% |
| SA0015 | 0.7% | 0.3% | 1.3% | 6.5% | 0.1% | 6.6% | 0.6% | 16.1% | 1.8% | 16.3% | 34.1% |
| SA0016 | 1.2% | 0.1% | 1.8% | 5.2% | 0.0% | 1.0% | 14.7% | 23.9% | 8.2% | 4.7% | 36.8% |
| ***SA0017*** | ***0.8%*** | ***0.1%*** | ***0.9%*** | ***6.9%*** | ***0.0%*** | ***2.5%*** | ***17.9%*** | ***29.2%*** | ***9.2%*** | ***0.0%*** | ***38.4%*** |
| SA0019 | 0.6% | 0.1% | 0.7% | 4.5% | 0.1% | 1.0% | 12.7% | 19.7% | 3.0% | 5.8% | 28.5% |
| ***SA0020*** | ***0.0%*** | ***2.1%*** | ***0.0%*** | ***4.4%*** | ***0.1%*** | ***5.8%*** | ***14.6%*** | ***27.1%*** | ***2.0%*** | ***0.0%*** | ***29.1%*** |
| SA0021 | 0.8% | 0.3% | 1.5% | 8.7% | 0.1% | 2.7% | 12.6% | 26.6% | 12.8% | 5.4% | 44.8% |
| SA0022 | 0.6% | 0.0% | 0.8% | 6.5% | 0.1% | 3.5% | 16.4% | 28.0% | 2.6% | 8.8% | 39.4% |
| SA0023 | 0.7% | 0.0% | 1.9% | 7.5% | 0.5% | 6.3% | 9.3% | 26.2% | 1.3% | 12.5% | 39.9% |
| **Average** | ***0.8%*** | ***0.5%*** | ***1.1%*** | ***6.7%*** | ***0.2%*** | ***3.4%*** | ***12.9%*** | ***25.6%*** | ***5.3%*** | ***9.8%*** | ***40.7%*** |
| **Top 25%*** | ***1.1%*** | ***0.7%*** | ***0.9%*** | ***6.0%*** | ***0.1%*** | ***3.3%*** | ***13.5%*** | ***25.5%*** | ***6.4%*** | ***7.0%*** | ***38.8%*** |

* 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** | **$12,565** | **$10,340** | **$3,764** | **$4,622** | **$1,960** | **$2,723** | **$188** | **$610** | **$17,667** |
| **Top 25%*** | **$14,743** | **$9,231** | **$3,453** | **$7,665** | **$2,894** | **$3,638** | **$170** | **$1,081** | **$24,933** |

| | LIABILITIES | | ASSETS | |
|---|---|---|---|---|
| | Liabilities per usable hectare | Liabilities per milking cow | Equity per usable hectare | Average equity |
| | $/ha | $/cow | $/ha | % |
| **Average** | **$5,595** | **$4,803** | **$12,072** | **65%** |
| **Top 25%*** | **$8,642** | **$4,870** | **$16,291** | **68%** |

**Table A9** Historical data – statewide

Average farm income, costs and profit per kilogram of milk solids

| | INCOME | | | | VARIABLE COSTS | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Milk income (net) | | Gross farm income | | Herd costs | | Shed costs | | Feed costs | | Total variable costs | |
| Year | Nominal ($/kg MS) | Real ($/ kg MS)" | Nominal ($/kg MS) | Real ($/ kg MS)" | Nominal ($/kg MS) | Real ($/ kg MS)" | Nominal ($/kg MS) | Real ($/ kg MS)" | Nominal ($/kg MS) | Real ($/ kg MS)" | Nominal ($/kg MS) | Real ($/ kg MS)" |
| 2012–13 | $5.83 | $6.15 | $6.40 | $6.76 | $0.32 | $0.34 | $0.28 | $0.30 | $2.96 | $3.12 | $3.56 | $3.76 |
| 2013–14 | $6.83 | $7.00 | $7.74 | $7.93 | $0.30 | $0.31 | $0.26 | $0.27 | $3.04 | $3.12 | $3.61 | $3.70 |
| 2014–15 | $6.35 | $6.42 | $7.03 | $7.10 | $0.29 | $0.29 | $0.22 | $0.23 | $3.28 | $3.31 | $3.79 | $3.82 |
| 2015–16 | $6.15 | $6.15 | $7.10 | $7.10 | $0.34 | $0.34 | $0.24 | $0.24 | $3.13 | $3.13 | $3.71 | $3.71 |
| **Average** | | **$6.43** | | **$7.22** | | **$0.32** | | **$0.26** | | **$3.17** | | **$3.75** |

*Note: 'Real' dollar values are the nominal values converted to 2015–16 dollar equivalents by the consumer price index (CPI) to allow for inflation*

| | OVERHEAD COSTS | | | | | | PROFIT | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cash overhead costs | | Non-cash overhead costs | | Total overhead costs | | Earnings before interest and tax | | Interest and lease charges | | Net farm income | | | |
| Year | Nominal ($/kg MS) | Real ($/ kg MS) | Nominal ($/kg MS) | Real ($/ kg MS) | Nominal ($/kg MS) | Real ($/ kg MS) | Nominal ($/kg MS) | Real ($/ kg MS) | Nominal ($/kg MS) | Real ($/ kg MS) | Nominal ($/kg MS) | Real ($/ kg MS) | Return on asset | Return on equity |
| 2012–13 | $1.55 | $1.64 | $1.60 | $1.69 | $3.15 | $3.33 | -$0.31 | -$0.33 | $0.53 | $0.56 | -$0.84 | -$0.89 | -0.6% | -4.9% |
| 2013–14 | $1.54 | $1.58 | $1.31 | $1.34 | $2.85 | $2.93 | $1.27 | $1.30 | $0.52 | $0.53 | $0.75 | $0.77 | 6.2% | 8.5% |
| 2014–15 | $1.50 | $1.51 | $1.03 | $1.04 | $2.52 | $2.55 | $0.72 | $0.73 | $0.55 | $0.56 | $0.16 | $0.17 | 3.9% | 3.6% |
| 2015–16 | $1.60 | $1.60 | $1.00 | $1.00 | $2.60 | $2.60 | $0.79 | $0.79 | $0.57 | $0.57 | $0.22 | $0.22 | 3.1% | -1.5% |
| **Average** | | **$1.58** | | **$1.27** | | **$2.85** | | **$0.62** | | **$0.56** | | **$0.07** | **3.1%** | **1.4%** |

*Note: 'Real' dollar values are the nominal values converted to 2015–16 dollar equivalents by the consumer price index (CPI) to allow for inflation*

**Table A10** Historical data – statewide

Average farm physical information

| | Total usable area | Milking area | Water used | Number of milking cows | Milking cows per useable area | Milk sold | Milk sold | Estimated grazed pasture* | Estimated conserved feed* | Home grown feed as % of ME consumed | Concentrate price | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | ha | ha | mm/ha | hd | hd/ha | kg MS/ cow | kg MS/ ha | t DM/ ha | t DM/ ha | % of ME | Nominal ($/T DM) | Real ($/ T DM) |
| 2012–13 | 340 | 141 | 650 | 320 | 1.2 | 527 | 622 | 4.8 | 1.2 | 51% | $304 | $321 |
| 2013–14 | 526 | 164 | 897 | 453 | 1.4 | 469 | 660 | 7.9 | 0.9 | 57% | $343 | $352 |
| 2014–15 | 529 | 159 | 618 | 362 | 1.3 | 581 | 738 | -11.5 | 4.1 | 44% | $364 | $367 |
| 2015–16 | 447 | 131 | 777 | 355 | 1.4 | 586 | 751 | 6.4 | 1.4 | 48% | $366 | $366 |
| **Average** | **460** | **149** | **735** | **373** | **1.3** | **541** | **693** | **1.9** | **1.9** | **50%** | | **$351** |

**From 2011–12 estimated grazed pasture and conserved feed was calculated per hectare of milking area*

# Appendix B: Glossary of terms, abbreviations and standard values

**All other income**

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

**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 owned land and buildings, leased land, plant and machinery, fixtures and fittings, trading stock, farm investments (ie Farm Management Deposits), debtors, and cash.

**Cash overheads**

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

**Cost of production**

The cost of producing the main product of the business; milk. Usually expressed in terms of the main enterprise output ie dollars per kilogram of milk solids. It is reported at the following levels;

Cash cost of production; variable costs plus cash overhead costs

Cost of production excluding inventory changes; variable costs plus cash and non-cash overhead costs

Cost of production including inventory changes; variable costs plus cash and non-cash overhead costs, accounting for feed inventory change and livestock inventory change minus livestock purchases

**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 a non-cash cost of the business, 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, 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 and workcover

**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**

See interest and lease costs.

**Full time equivalent (FTE)**

Standardised labour unit. Equal to 2,400 hours a year. Calculated as 50 hours a week for 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) x dry matter content (DM %) x 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 farm income minus total variable costs.

**Herd costs**

Cost of artificial insemination (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 the cost of owner/operator, family and sharefarmer time in the business, valued at $28 per hour.

**Interest and lease costs**

Total interest plus total lease costs paid.

**Labour cost**

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

**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.

**Liability**

Money owed to someone else, eg family or a financial institute such as a bank

**Livestock trading profit**

An estimate of the annual contribution to gross farm 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.

**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. This is net of compulsory levies and charges.

**Milking area**

Total usable area minus out-blocks or run-off areas.

**Net farm income**

*Previously reported as business profit*

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

**Nominal terms**

Dollar values or interest rates that include an inflation component.

**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, and rents from farm cottages.

**Overhead costs**

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

**Real terms**

Dollar values or interest rates that have no inflation component.

**Return on assets (RoA)**

Earnings before interest and tax divided by the value of total assets under management, including owned and leased land..

**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, rubberware, vacuum pump oil etc.

**Total usable area**

Total hectares managed minus the area of land which is of little or no value for livestock production eg 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; (total megalitres of water used/total usable area) x 100.

**Variable costs**

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

# List of abbreviations

| | |
|---|---|
| **AI** | Artificial insemination |
| **CH4** | Methane gas |
| **CO2** | Carbon dioxide gas |
| **CO2-e** | Carbon dioxide equivalent |
| **CoP** | Cost of production |
| **DFMP** | Dairy Farm Monitor Project |
| **DM** | Dry matter of feed stuffs |
| **DEDJTR** | Department of Economic Development, Jobs, Transport and Resources, Victoria |
| **EBIT** | Earnings before interest and tax. |
| **FTE** | Full time equivalent. |
| **GWP** | Global Warming Potential. |
| **ha** | Hectare(s) |
| **hd** | Head of cattle |
| **HRWS** | High Reliability Water Shares |
| **kg** | Kilograms |
| **LRWS** | Low Reliability Water Shares. |
| **ME** | Metabolisable energy (MJ/kg) |
| **MJ** | Megajoules of energy |
| **mm** | Millimetres. 1 mm is equivalent to 4 points or 1/25th of an inch of rainfall |
| **MS** | Milk solids (proteins and fats) |
| **N2O** | Nitrous oxide gas |
| **Q1** | First quartile, i.e. the value of which one quarter, or 25%, of data in that range is less than |
| **Q3** | Third quartile, i.e. the value of which one quarter, or 25%, of data in that range is greater than |
| **RoA** | Return on assets |
| **RoE** | Return on equity |
| **t** | Tonne = 1,000 kg |

# Standard values

## Livestock values

The standard vales used to estimate the inventory values of livestock were:

| Category | Opening value ($/hd) | Closing value ($/hd) |
|---|---|---|
| Mature cows | $1,500 | $1,500 |
| 13–14 heifers | $1,050 | $1,500 |
| 14–15 heifers | $450 | $1,050 |
| 15–16 calves | | $450 |
| 14–15 bulls | $450 | $750 |
| 13–14 bulls | $750 | $750 |
| Mature bulls | $1,500 | $1,500 |

## Imputed owner/operator and family labour

In 2015–16 the imputed owner/operator and family labour rate was $28/hr based on a full time equivalent (FTE) working 48 hours/week for 50 weeks of the year.





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Your Levy at Work

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