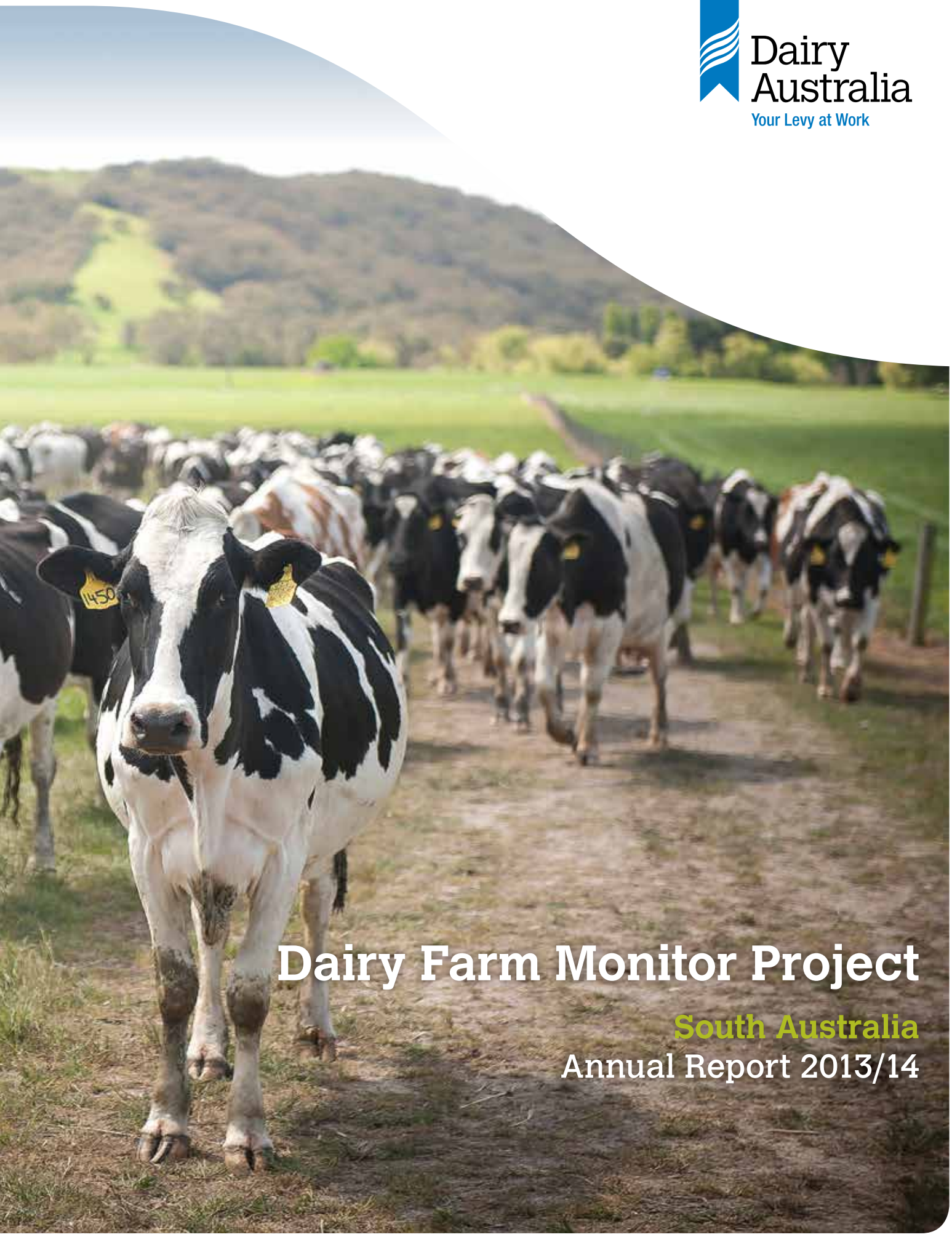
Dairy Australia
Your Levy at Work



Dairy Farm Monitor Project

South Australia
Annual Report 2013/14

Department of Environment and Primary Industries
State Government Victoria

DairySA | Dairy Australia

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 Environment and Primary Industries Victoria, and Helen Quinn from Dairy Australia.

The diligent work of DEPI Dairy Services who gathered the final performance data deserve particular thanks, especially to Olive Montecillo, Natalie Nelson and Katrina Lawrence who continued to be actively involved in the report through to its publication.

This report has been produced by Lachie Hood and Chris Scheid, from ProAdvice, in conjunction with Natalie Nelson from the Department of Environment and Primary Industries Victoria.

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Dairy Australia

Published by Dairy Australia Limited.

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Notes on the presentation of data in this report

This section of the report defines and explains the calculations used and the data presented throughout the report.

This section is not to be confused with *Section II—Farm monitor method* which discusses the method for the farm data analysis.

This report is presented in the following parts:

- Executive summary
- Farm monitor method
- Statewide overview
- Business confidence survey
- Greenhouse report
- Appendices.

Participants were selected for the project in order to represent a distribution of farm sizes, herd sizes and geographical locations within each region. The results published in this report should not be taken to represent population averages as the participant farms were not selected via random population sampling.

The report presents visual descriptions of the data for the 2013/14 year. Data is presented for individual farms, state averages and the state's top 25% of farms ranked by return on assets. Reported averages are calculated as the mean. These averages should in no way be considered averages for the population of farms in the state given the small sample size and farms were not randomly selected.

Data describing the performance of the top 25% of farms is included in this report. Return on assets is the determinant of the top producers as it provides an assessment of the performance of the whole farm while accounting for differences in location and production system. The top 25%, based on this criteria, are shaded in the Figures throughout this report.

The Q1–Q3 data range for key indicators is also presented in the tables to give 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 Q3 value is the quartile 3 value. That is, the value of which one quarter (25%) of data in that range is greater than. This means that the middle 50% of data sits between the Q1–Q3 data range.

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

Milk production data is presented in kilograms of milk solids as farms are paid according to milk solids.

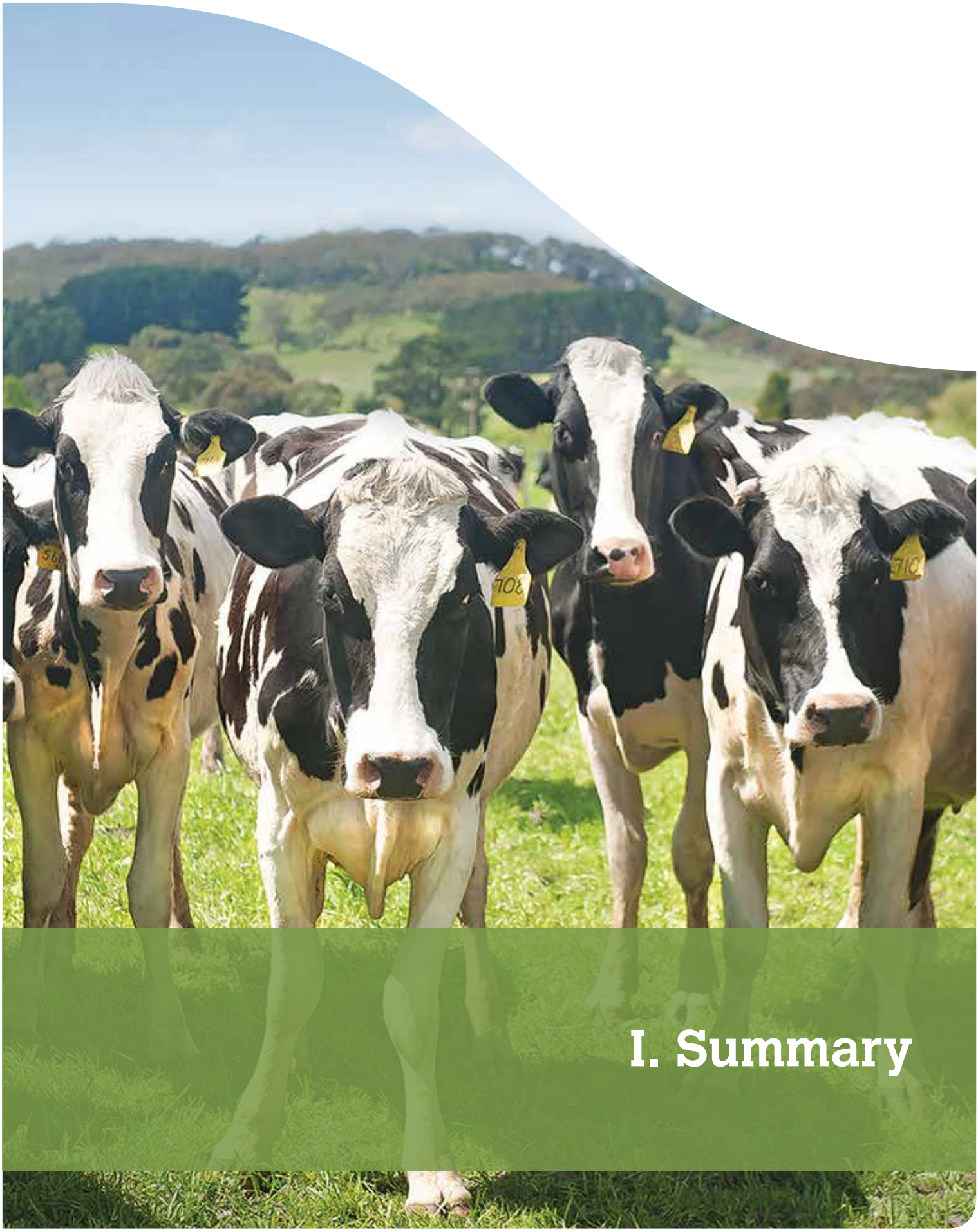
The report will focus on measures on a per kilogram of milk solids basis, with occasional referral to measure on a per hectare or per cow basis. The appendix tables contain the majority of financial information in a per kilogram of milk solids basis.

The method used is a combination of that used in the *Livestock Farm Monitor Project,* and various other referenced sources. Attention should be paid to the method when directly comparing figures from this report with those generated via other means. More detail on the method is provided in *Section II—Farm monitor method*.

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.

Discussion on 'last year' refers to the 2012/13 Dairy Farm Monitor Project report. Price and cost comparisons between years are nominal unless otherwise stated. While all of the participants from the 2012/13 report are in the 2013/14 report, there are also three new participants in this year's dataset. It is important to keep this in mind when comparing datasets between years.

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



I. Summary

Summary

This is the second 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 SA dairy farmers reported an average return on assets (RoA) of 6.2% in 2013/14, compared to -0.6% in 2012/13. The average return on equity (RoE) increased from -4.9% in 2012/13 to 8.5% in 2013/14. A large part of the RoA and RoE improvement was due to milk prices received being 17% higher ($5.83/kg MS in 2012/13 and $6.83/kg MS in 2013/14).

An improvement in operating conditions such as increase in rainfall and higher milk prices were a welcome change in 2013/14 from the previous year. During 2012/13 farmers across the state experienced a harsh combination of the high Australian dollar, low milk prices, high feed prices and a very short growing season. This year's above average rainfall and cooler spring took the pressure off farmers and boosted pasture growth across the state.

The average milk price for 2013/14 was $6.83/kg MS which increased gross farm income to $7.74/kg MS and restored farmer confidence in the industry. This enabled farmers to repay creditors, consolidate their business, attend to repairs and maintenance and make capital purchases.

Input costs remain a concern for farmers in both the short and medium term with the average cost of production being $6.22/kg MS in 2013/14. The total variable cost this year was $3.61/kg MS with feed (purchased and home grown) accounting for 84% of variable costs. The average overhead cost was $2.85/kg MS, which was 10% lower than 2012/13 at $3.15/kg MS. This was largely due to a reduction in imputed labour costs this financial year. Repairs and maintenance costs increased by 19% with some farmers in a position to replace worn out plant and machinery.

Average earnings before interest and tax (EBIT) for 2013/14 was $1.27/kg MS (or $324,259 per farm); well up on last year's average of -$0.31/kg MS (or -$6,281 per farm).

Return on equity (RoE) was the most noticeable economic indicator to improve, last year averaging -4.9% (-$87,104 net farm income) with only two participants managing a positive return. In contrast, most participants in 2013/14 posted a positive RoE with an average of 8.5% ($216,359 net farm income). The improvements in RoA and RoE were largely due to higher milk prices ($5.83/kg MS versus $6.83/kg MS) in the 2013/14 year.

Following two such contrasting years, expectations for 2014/15 are varied. Recognising this year's high milk prices, farmers are expecting a reduction in price but will be looking to maintain or increase milk production. Farm development, milk prices and input costs are the main issues facing farmers over the next 12-month period while succession and irrigation water are the major long term issues.

Introduced in this year's report, a greenhouse gas emission audit showed the level of greenhouse gasses emitted by South Australian dairy farmers was 12.58 tonnes of CO_2 equivalent per tonne of milk solids for 2013/14.

II. Farm monitor method

Farm monitor method

This section of the report explains the methodology behind how figures in the Dairy Farm Monitor Project (DFMP) are calculated and what they mean. It helps put farm business economic terminology into context.

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

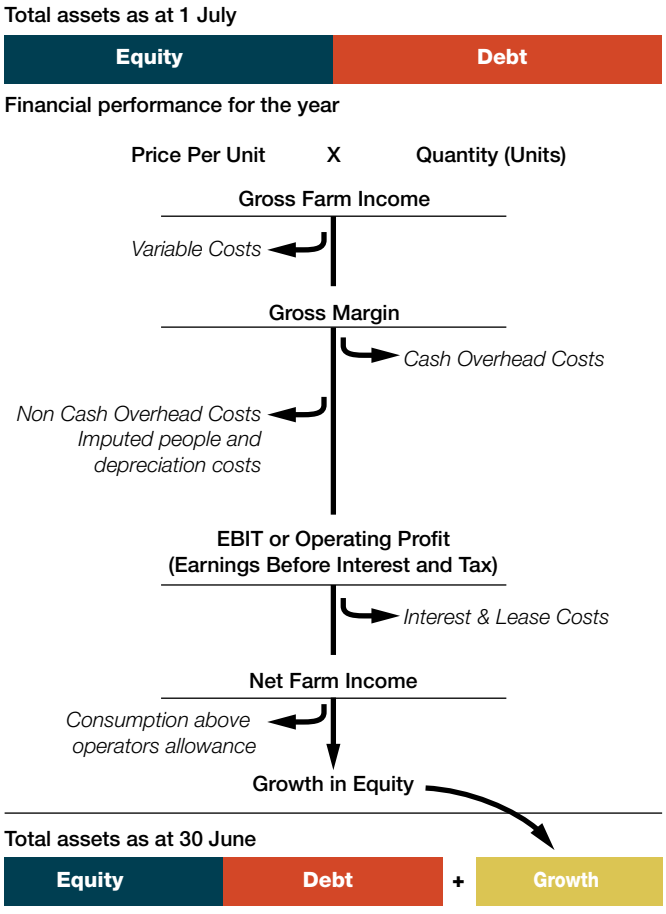


Figure 1 demonstrates how all of the different farm business economic terms come together and are calculated. It is adapted from an initial diagram obtained from Bill Malcolm (2008) at the University of Melbourne. The diagram shows the different profitability measures as certain costs are deducted from total income. It also discusses capital and growth.

Growth is achieved by investing in assets which generate income. These assets can be owned with equity (one's own capital) and debt (borrowed capital), as shown in Figure 1. In order for the assets to generate income they need to be farmed and managed, which involves incurring costs. The amount of growth is dependent on the maximisation of income and minimisation of costs, or cost efficiency relative to income generation.

The method is also shown using the state average results in Figure 2. Production and economic data are identified to indicate how the terms are calculated and how they all fit together.

Gross farm income

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

Variable costs

Variable costs are costs that are specific to an enterprise, such as herd, shed and feed costs, and vary directly in relation to the size of the enterprise. Subtracting variable costs from total income, only for the dairy enterprise, gives a 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.

Overhead costs

Overhead costs are costs that are not directly related to an enterprise as they are expenses incurred through the general operating of the business. The DFMP separates overheads into cash overheads and non cash overheads, to distinguish between cash flows of the business. Cash overheads are those fixed costs such as 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) is calculated by subtracting variable and overhead costs from gross farm income. EBIT 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 left over is business profit (after tax) or surplus and therefore growth, as it can be invested into the business to expand the equity base; either by direct reinvestment or the payment of debt.

Return on assets and return on equity

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

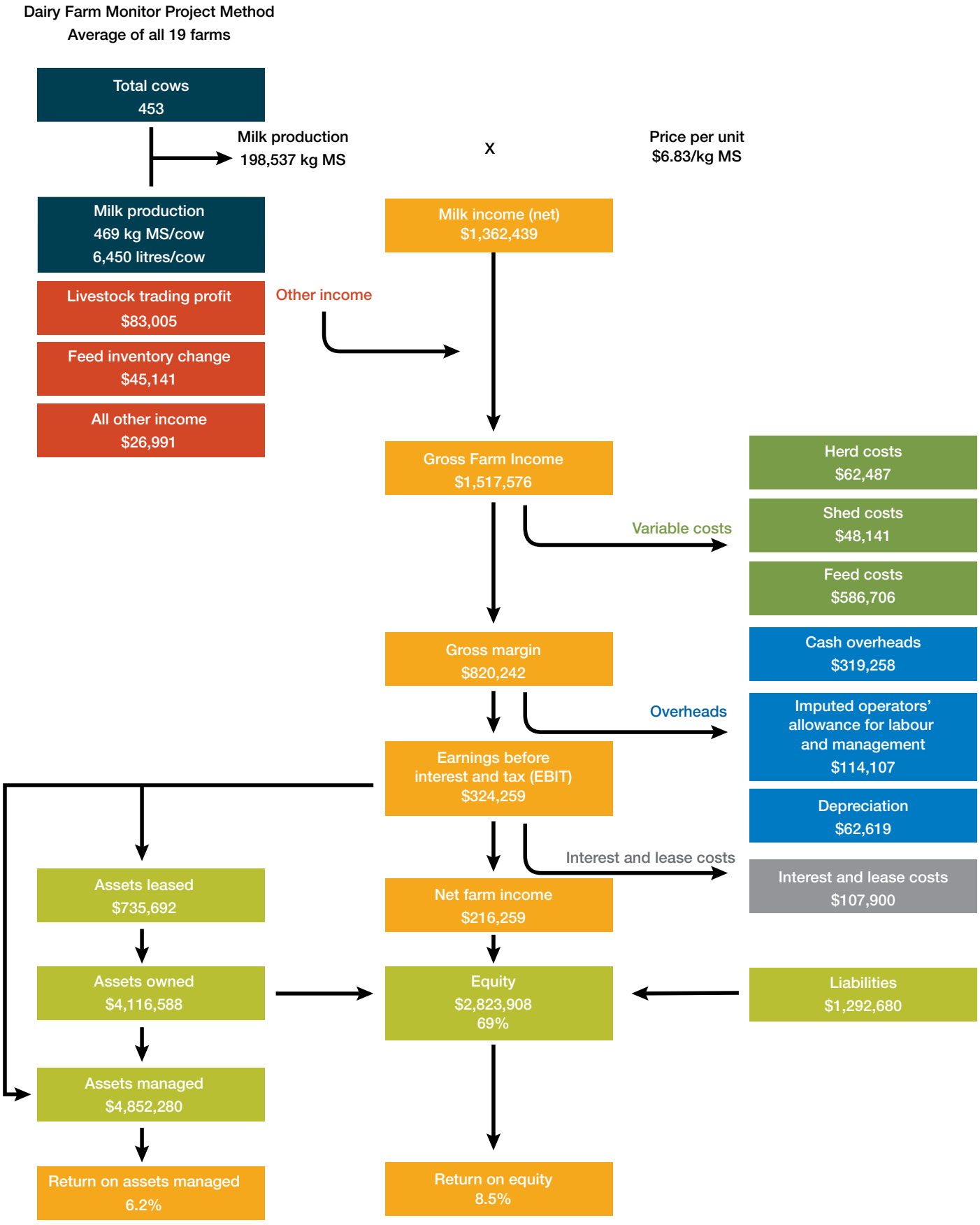
Return on assets (RoA) indicates the overall earning of the total farm assets, irrespective of the capital structure of the business. It is EBIT or operating profit expressed as a percentage of the total assets under management in the farm business, including the value of leased assets. EBIT expressed as a return on total assets is the return from farming. There is also a further return to the asset from any increase in the value of the assets over the year, such as land value. If land value goes up 5% over the year, this is added to the return from farming to give total return to the investment. This return to total assets can be compared with the performance of alternative investments with similar risk in the economy.

Return on asset enables a more complete assessment than EBIT to be made of individual and between different farming businesses. RoA ignores how the operation is financed while also accounting for the difference in the productive capacity of land in different areas and regions.

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 businesses and the situation of the owners, including their attitude towards risk.

Return on equity (RoE) 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).

Figure 2. Dairy Farm Monitor Project Method profit map—South Australia state average data[1]



1. Profit map adapted from Queensland Dairy Accounting Scheme—2010 with permission from Ray Murphy, Department of Employment, Economic Development and Innovation, Queensland.

III. South Australia overview

South Australian dairy industry

South Australia represents approximately 6 per cent, or 537 million litres, of the national output of milk in the Australian dairy industry.

South Australia's milk has a record of high component values in terms of butterfat and protein levels; this adds to its value in longer shelf life and versatility to the 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. Milk production has increased in the past few years as farmers actively aim to develop their production skills and feeding regimes.

The Central region (shaded blue) has three subregions—the Fleurieu Peninsula, River & Lakes and the Adelaide Hills. The Fleurieu Peninsula and Adelaide Hills traditionally have high average rainfall and higher land values. They are predominantly dryland dairy farming areas. The number of farms in the area are 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 competing land use. However the farmers in the regions remain committed to high quality milk and herd production.

The River & Lakes has a history of being strongly affected by drought and severe water restrictions. The farms are highly dependent on irrigation and natural water flows for stock and domestic purposes. This has caused a reduction in the number of dairy farms in the region. Those remaining are extremely resilient and are developing more flexible and profitable dairy farming systems.

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. It is predominantly supported by summer irrigated pastures. This region produces over 60% of the state's milk.

Figure 3. South Australian Dairying Regions

2013/14 Seasonal conditions

The 2013/14 year presented varied weather patterns across South Australia although a vast improvement on 2012/13.

Seasonal conditions were mostly favourable across the dairy regions in South Australia. There were a few farms that did not receive above average rainfall. However, overall SA dairy farmers benefited from increased production of hay, silage and feed grains that were available compared to the 2012/13 year when pasture production and availability of hay and silage were curtailed by the early finish to spring.

Above average rainfall in the winter months led to a higher volume of pasture grazed. The amount of pasture grazed averaged 7.9 t/DM/ha, a 65% increase on last year's figure of 4.8 t/DM/ha.

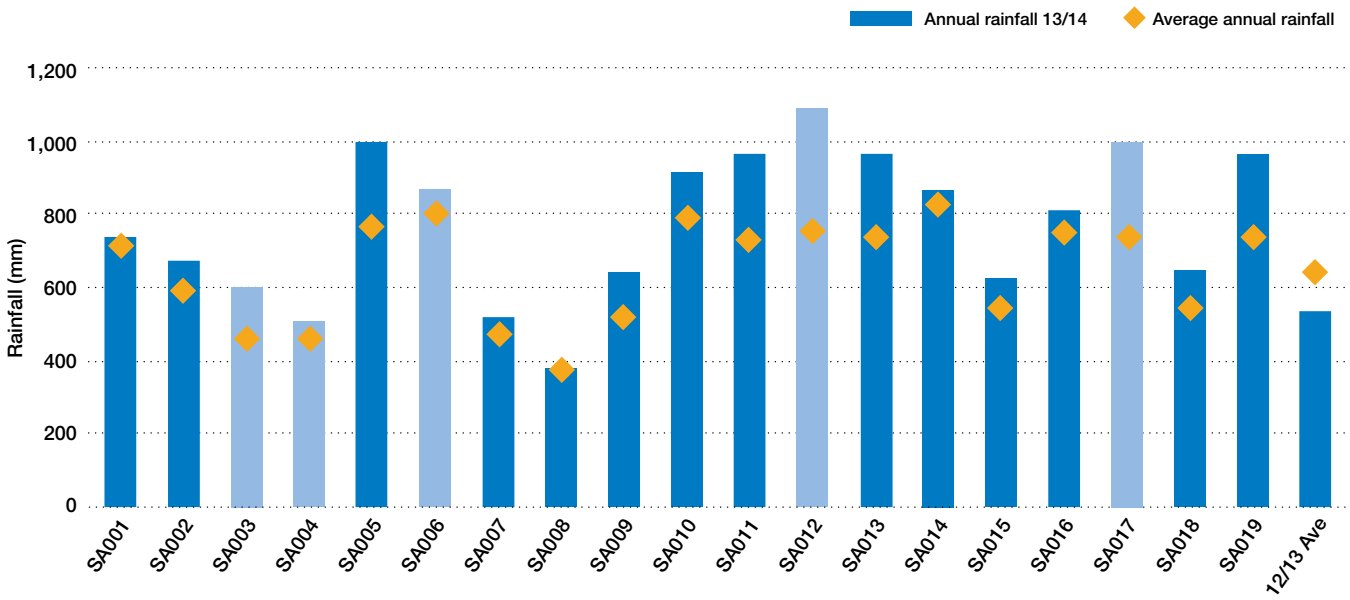
Although the southern parts of the state experienced a wet winter and abundant spring, the northern dairy regions experienced a mild but earlier than average spring, with summer months being hot and dry. This meant producers still used their full water allocations to increase pasture and fodder production.

As a result most farmers increased their feed inventories and the proportion of total energy imported was reduced from 66% of metabolisable energy (ME) to 43% in 2013/14.

Figure 4 below shows all of the participant farmers received above their long-term average annual rainfall, most of which came from heavy winter rains.

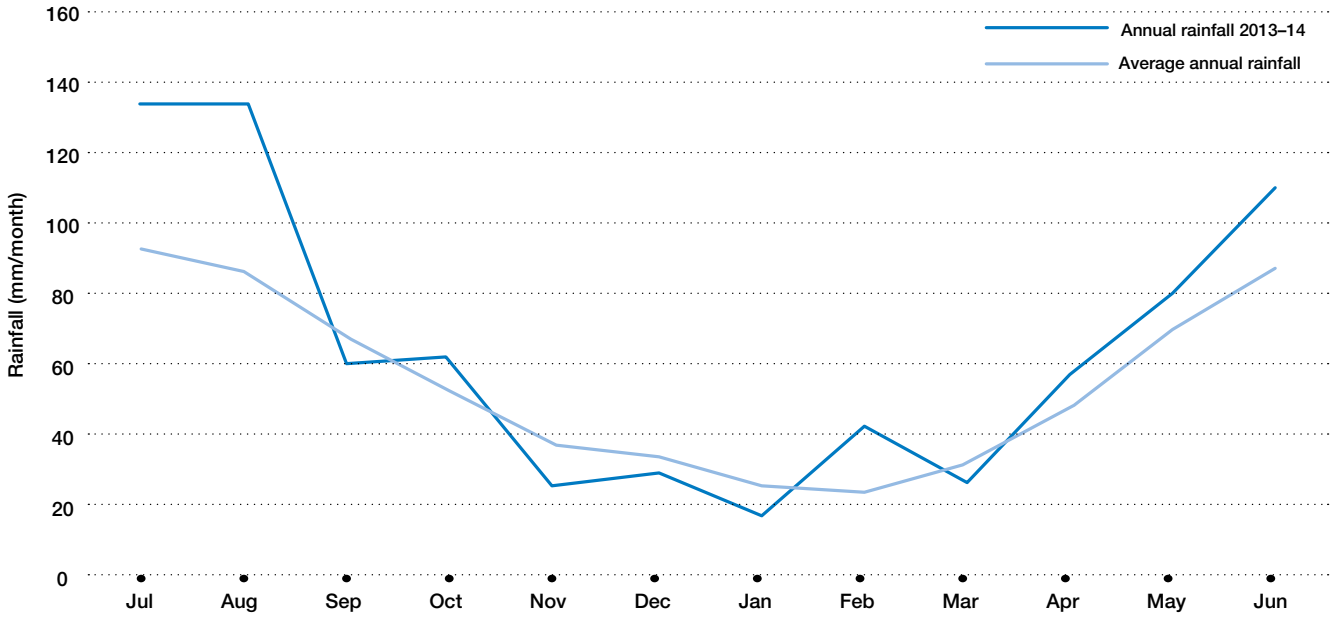
Return on assets is the determinant of the top producers as it provides an assessment of the performance of the whole farm while accounting for differences in location and production system. The top 25%, based on this criteria, are shaded in the Figures throughout this report. Notes on the calculations used and the data presented throughout the report are explained on page 2.

Figure 4. 2013/14 Annual rainfall and long term average rainfall



Across the South East of SA, rain continued to fall right through spring as opposed to the other two major dairying areas of SA. The average rainfall received in 2013/14 for most was 20% higher than the annual long-term with a higher winter occurrence in all areas (Figure 5).

Figure 5. Monthly average rainfall (all farms)



Whole farm analysis

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 explain their ability to be more profitable. Caution must be taken when looking at the physical parametres in isolation.

The top 25% for 2013/14 carried a 29% higher stocking rate than the average. They sold 30% more kg MS/ha than average and were 19% more efficient in terms of milk solids per full time labour equivalent (kg MS/FTE).

The top 25% of participants used 53% of home grown feed as % of total ME consumed compared to an average of 57%. The Q1 to Q3 range of 47% to 68% illustrates the wide range of homegrown feed consumed by South Australian farmers. Farmers were less concerned about feeding better quality concentrates this year as the higher milk price gave them the capacity to gain production from these supplements.

The average amount of water used for the year was up this year by 38% from 650mm/ha last year to 897mm/ha in 2013/14 as a result of increased rainfall.

Table 1. Average farm physical data—state overview

Farm physical parameters	South Australian Average	Q1 to Q3 range	Top 25% average
Annual Rainfall 13/14 (mm)	778	634–965	814
Water used (irrigation (mm/ha) + rainfall (mm))	897	634–1,087	989
Total usable area (hectares)	526	194–413	430
Milking cows per usable hectare	1.4	0.8–1.7	1.8
Milk solids sold (kg MS /cow)	469	374–551	471
Milk solids sold (kg MS /ha)	660	355–929	857
Home grown feed as % of ME consumed	57%	47%–68%	53%
Labour efficiency (milking cows / FTE)	105	80–128	123
Labour efficiency (kg MS / FTE)	48,167	36,973–55,225	57,458

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 of feed inventories.

Figure 6 below represents the gross farm income for participant farms throughout South Australia. The majority of farms received gross farm income between $6.00/kg MS and $8.00/kg MS with an average of $7.74/kg MS and the top 25% receiving $8.05/kg MS.

It was an exceptional year for milk prices throughout South Australia with an average of $6.83/kg MS, an increase of 17% over last year's average milkprice of $5.83/kg MS. Those who had the ability to take advantage of the higher demand and price for export heifers received an increase in livestock trading profit as well.

The year was assisted by favourable climatic conditions which enabled producers to store fodder and replenish feed inventories which were depleted in 2012/13.

Figure 6. Gross farm income per kilogram of milk solids

Milk solids production

Figure 7 shows milk solids produced per hectare. The varied per hectare production is a reflection of the diverse farming systems throughout South Australia rather than quality of management.

With a variety of farming systems in the state, there is a wide range of milk solids per hectare—from 149 kg MS/ha to 1,649 kg MS/ha averaging 660 kg MS/ha. This was a 6% increase in yield from 2012/13 when the average milk solids sold was 622kg MS/ha. Such a wide variance in milk production in 2013/14 was due to a combination of factors contained within each of state's dairy regions—different rainfall and irrigation use; seasonal temperatures; soil types and stocking rates.

Average stocking rate increased this year from 1.2 to 1.4 cows per usable hectare which was made possible by a more favourable season than 2012/13, the higher milk price and affordability of feed.

Two of the five top 25% farms were below the average MS/ha line which suggests that milk production was not the solitary factor that contributed to their profit performance.

Figure 7. Milk solids sold per hectare

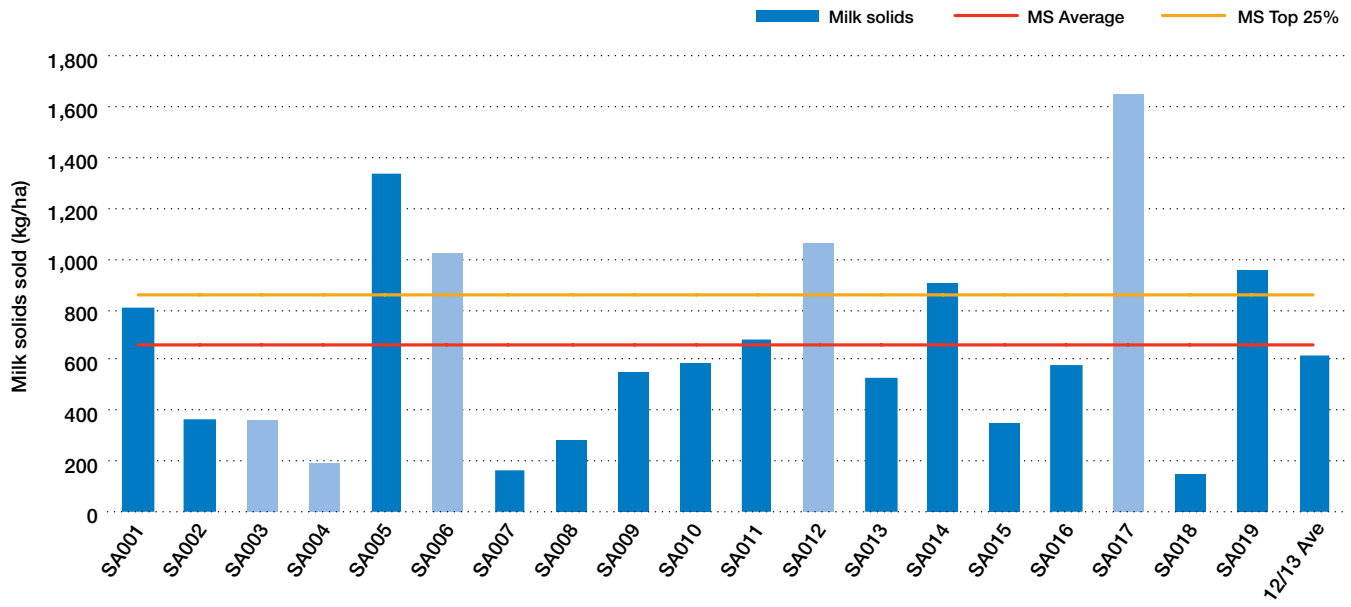
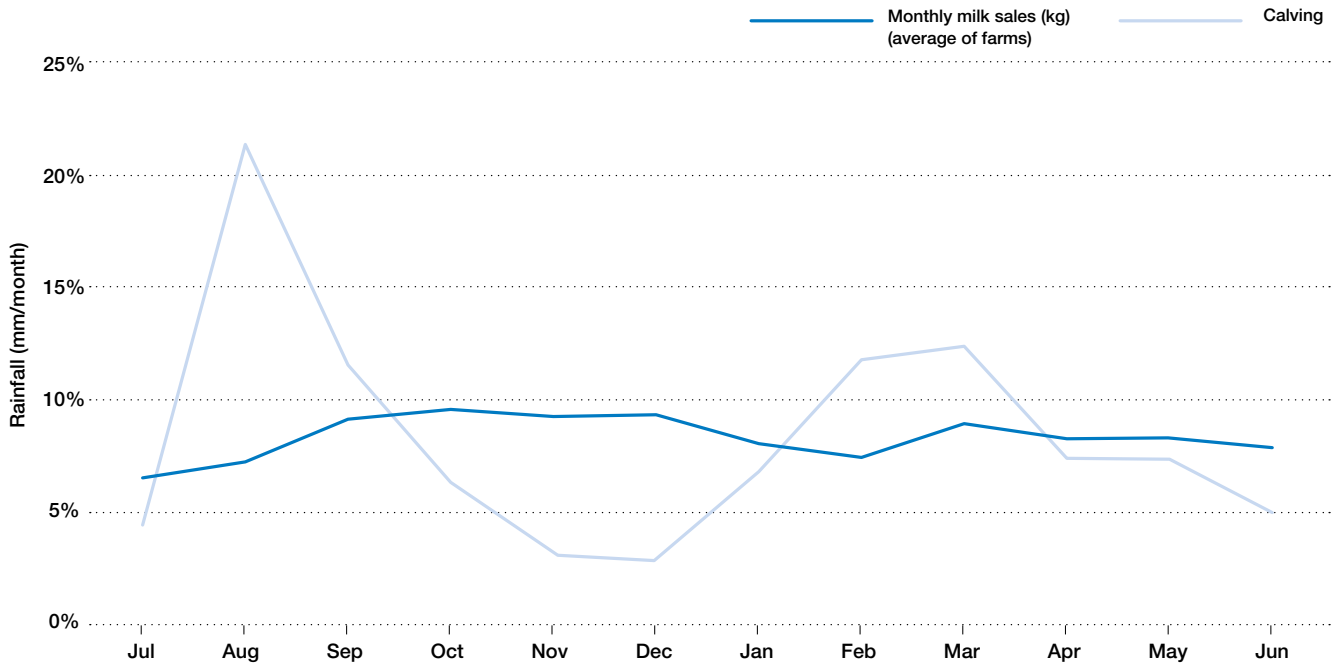


Figure 8 below shows the milk solid sales against the monthly distribution of calves born. Year round calving was present as well as seasonal and split calving evident by the two calving peaks in spring and autumn.

Although there were peaks and troughs in calving, milk solid sales were relatively stable. Milk solid sales recorded the lowest monthly sales figure amongst farmers in July which is reflective of targeted calving to meet pasture growth. Calvings continue throughout the spring where milk solid sales again dip in February as autumn calving has already begun.

This indicates that seasonal, split calving and year round calving patterns are present in South Australia and to some degree are dependent on the rainfall and pasture availability in each of the regions.

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.

Variable costs were up $0.05 (1.4%) this year increasing from 3.56/kg MS to $3.61/kg MS.

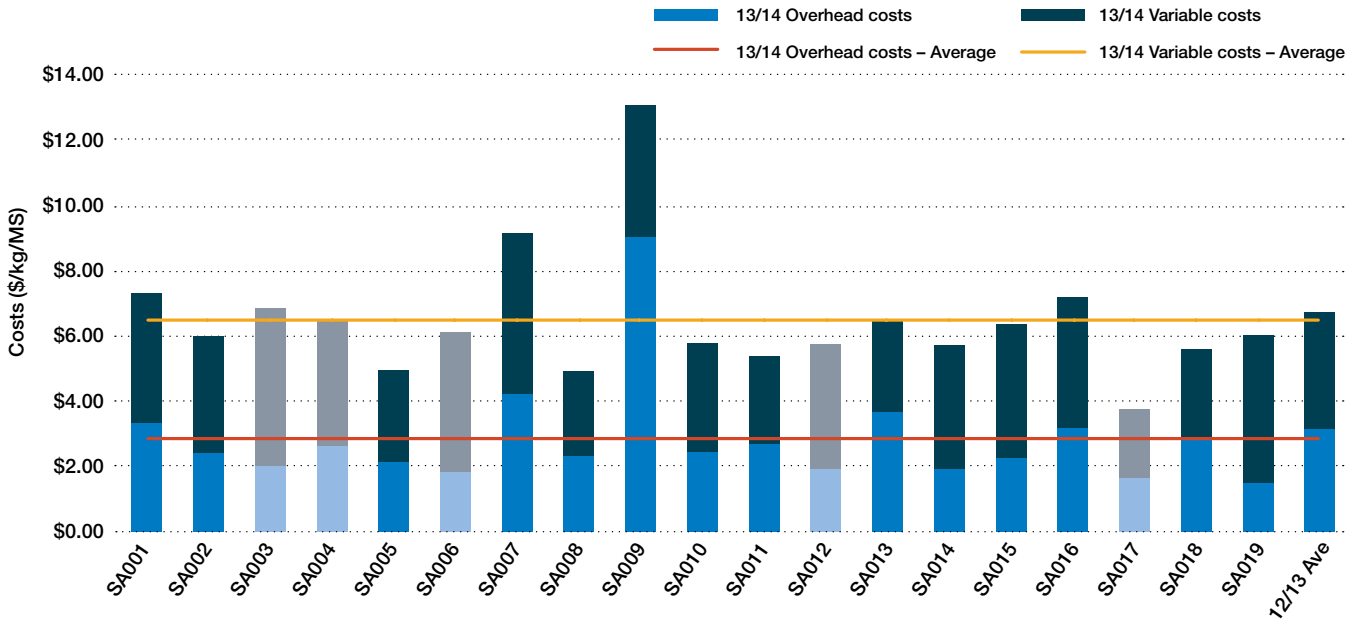
Home grown feed, purchased feed and agistment were clearly the largest portion of variable costs contributing $3.04/kg MS (84%). Homegrown and purchased feed alone accounted for 33% of total cost of production this year.

Purchased feed remains a key expense with grain and other purchased concentrates costing South Australian participant producers an average of $1.43/kg MS (40% of all variable costs); up 15% on last year. In comparison, pasture costs including irrigation expenses contributed $1.12kg MS (or 31%) of all variable costs. With higher milk prices, farmers had the capacity to also increase the quality of concentrates fed.

While fodder purchase costs remained stable at $0.41/kg MS, pasture costs increased by 30%, from $0.53 to $0.69/kg MS as a result of higher rainfall and the longer growing season compared to 2012/13.

A breakdown of variable costs for the individual businesses on a $/kg MS basis can be seen in Appendix Table A4.

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



Overhead costs

Overhead costs are those which have little correlation with the level of farm production. These include such costs as depreciation, administration, rates and insurance, farm labour and imputed owner/family labour, bank charges and repairs and maintenance. In Figure 9 above, depicted by the lower portion of the stacked bars, the level of overhead costs for each participant farm is shown.

The total average overhead costs for 2013/14 was $2.85/kg MS which was down on last year's $2.99/kg MS (a 4.7% reduction). This drop is largely due to a decrease in imputed labour from $1.16/kg MS to $0.96/kg MS.

Repairs and maintenance (R&M) increased significantly this year with a six-fold increase from $0.06 to $0.37/kg MS. Many farmers either increased R&M expenditure to catch up on the 2012/13 season or simply increased capital expenditure and replaced machinery or milking plant. One farm reported repairs and maintenance costs of $1.16/kg MS which is an indication of this particular farm undertaking two years of maintenance in one.

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.

The changes in inventory are important to establish as they are true incomes or costs to the business. The changes in fodder inventory count for the net cost of feed fed out, conserved, purchased and stored over the year. The gain or loss in livestock inventory that occurs throughout the trading year is also considered in the cost of production calculation.

Table 2 shows that the average cost of production was $6.22/kg MS; down on last year's $6.71/kg MS (a 7.3% reduction).

It should be noted that the feed inventory decreased this year by an average of $0.25/kg MS indicating more fodder was on hand at the beginning of the year than at the end of the year.

The top 25% producers were able to achieve a cost of production as low as $5.33/kg MS with a $0.83/kg MS saving in overhead costs as compared with the state's average.

Table 2. Cost of production

Farm Costs	South Australia average	Q1 to Q3 range	Top 25% average
Inventory changes			
Livestock trading loss	$0.00	$0–$0	$0.00
Feed inventory change	-$0.25	$-0.33–$-0.01	-$0.46
Changes in inventory	-$0.25	$-0.3–$-0.01	-$0.46
Variable costs ($/kg MS)			
Herd costs	$0.30	$0.21–$0.34	$0.25
Shed costs	$0.26	$0.2–$0.32	$0.25
Purchased feed and agistment	$1.98	$1.21–$2.61	$2.42
Home grown feed cost	$1.06	$0.85–$1.19	$0.85
Total variable costs	$3.61	$2.8–$4.06	$3.77
Overhead costs ($/kg MS)			
Rates	$0.09	$0.03–$0.08	$0.03
Registration and insurance	$0.02	$0–$0.02	$0.02
Farm insurance	$0.08	$0.04–$0.09	$0.04
Repairs and maintenance	$0.37	$0.26–$0.42	$0.23
Bank charges	$0.03	$0–$0.04	$0.04
Other overheads	$0.19	$0.11–$0.24	$0.20
Employed people cost	$0.76	$0.46–$0.87	$0.79
Total cash overheads	$1.54	$1.12–$1.74	$1.34
Depreciation	$0.35	$0.27–$1.22	$0.22
Imputed people cost	$0.96	$0.17–$0.47	$0.46
Total overhead costs	**$2.85**	**$1.98–$3.05**	**$2.02**
Total cost of production	**$6.22**	**$5.40–$6.27**	**$5.33**

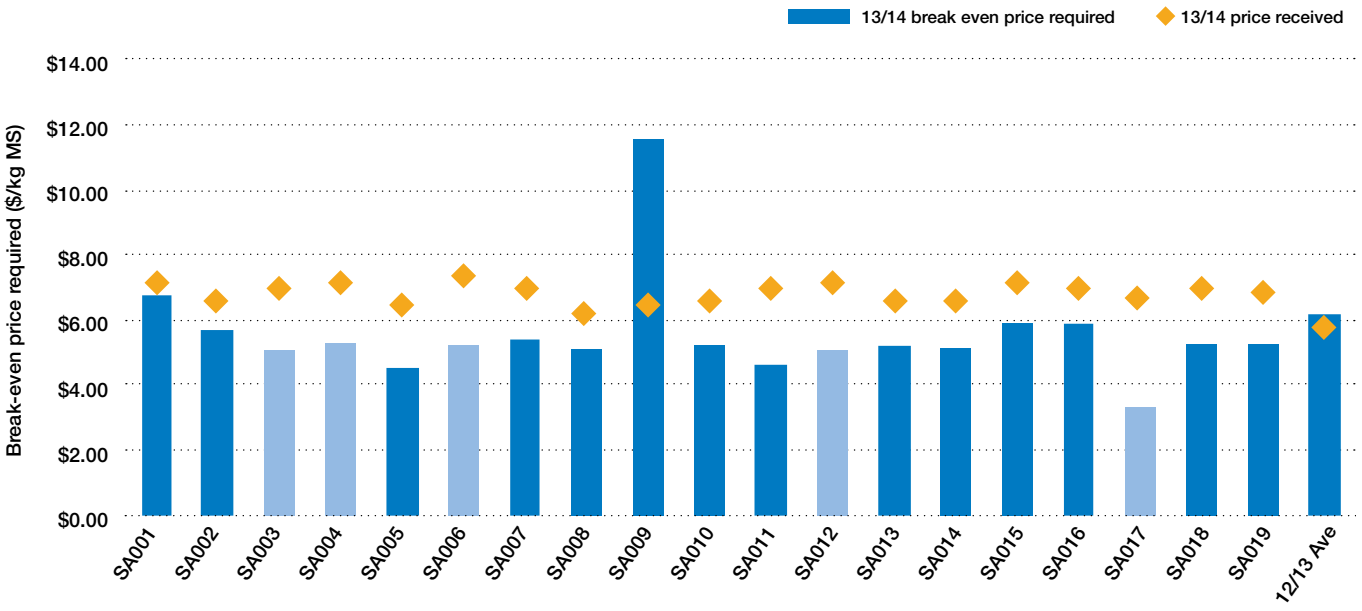
Break-even price required

Break-even price for milk is calculated by adding the overhead and variable costs, less income other than milk (this includes inventory changes, livestock trading profit and other income). The difference between the break-even price and milk income is the earnings before tax and interest (EBIT) per kilogram of milk solids.

Figure 10 shows that the milk price for most farms exceeded the cost of production for 2013/14. This increase in EBIT gave farmers the ability to consolidate their businesses and decide where to spend profit (e.g. make any capital purchases required).

Break-even price averaged $5.56/kg MS while the middle 50% of producers had a range from $5.10/kg MS to $5.54/kg MS. This differed considerably to the top 25% having a break-even milk price of $4.80/kg MS. This meant for most farmers there was a margin of approximately $2.18/kg MS to consolidate debt, reduce short term debts and/or purchase much needed capital items.

Figure 10. Break-even price required per kilogram of milk solids sold



Earnings before interest and tax

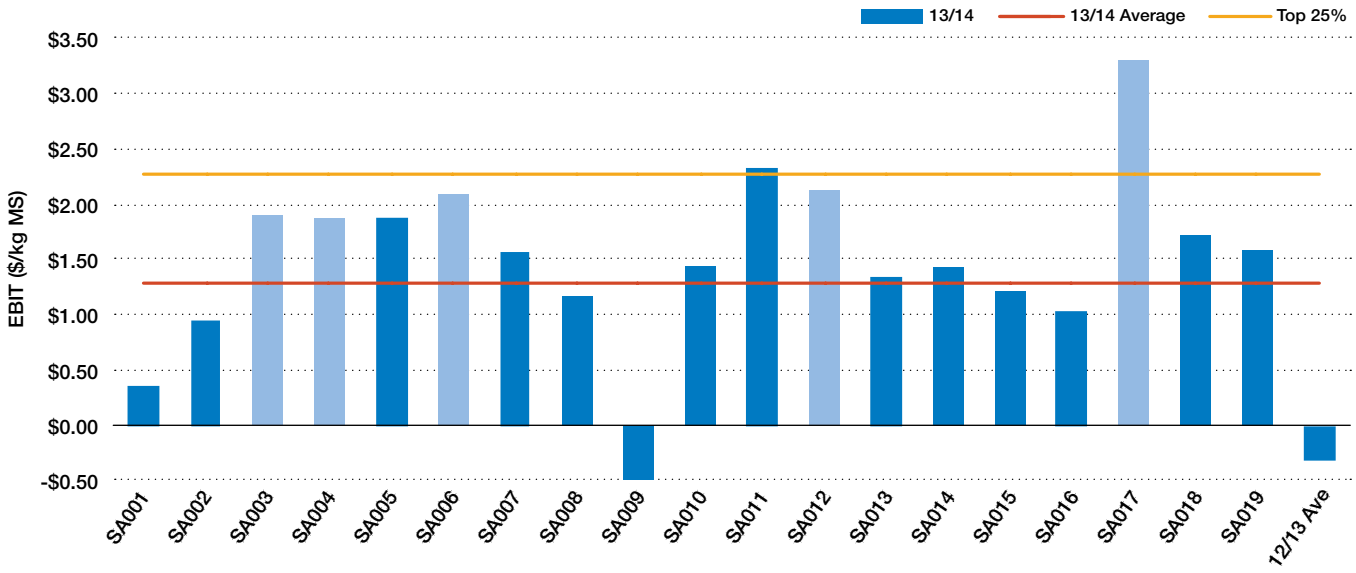
Earnings before interest and tax (EBIT) is the gross farm income less variable and overhead costs including non cash overhead costs, such as imputed labour and depreciation (Figure 11). As EBIT excludes interest and lease costs, it is a valuable measure of operating profit.

Average EBIT for 2013/14 was $1.27/kg MS; well up on last year's average of -$0.31/kg MS, and ranged from -$5.09 to $3.30/kg MS.

The change in EBIT is a considerable turnaround on last year and is largely due to the increased milk price along with more favourable conditions rather than a decrease in costs.

The top 25% recorded an average EBIT of $2.26/kg MS which meant they were able to retain 32% of their milk income before interest and tax.

Figure 11. Whole farm earnings before interest & tax per kilogram of milk solids



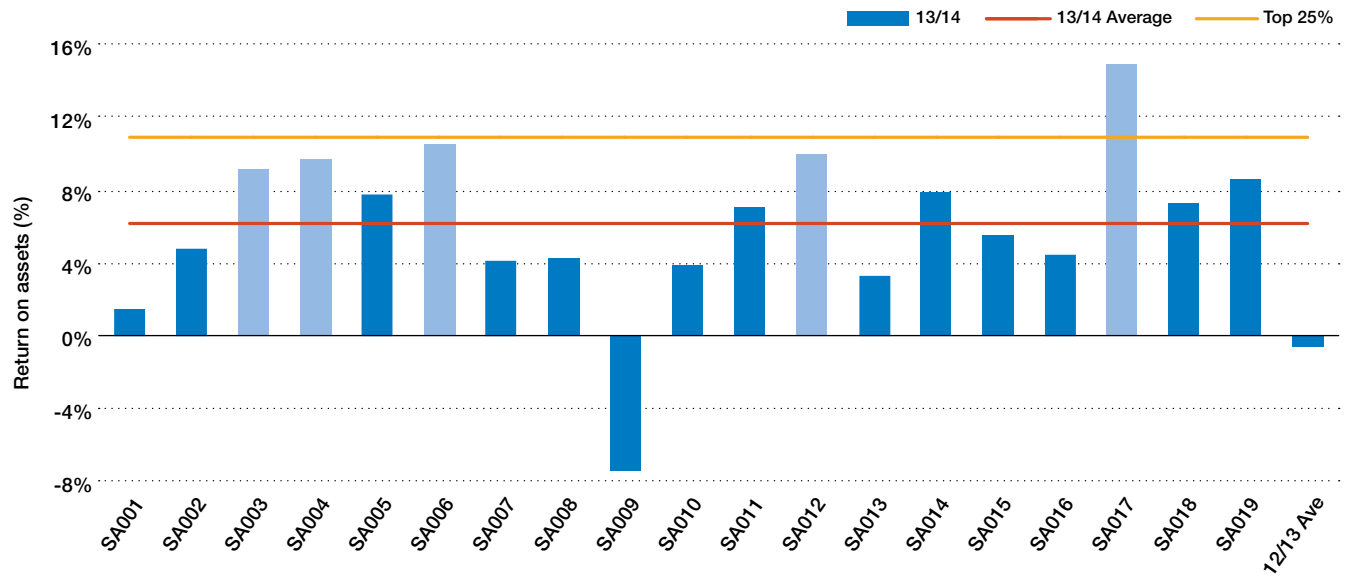
Return on assets and equity

Return on assets (RoA) as displayed in Figure 12 is the earnings before interest and tax (EBIT) expressed as a percentage of total assets under management. This indicates how profitably the assets are working for the business. Similarly, it is an earning indicator of the farm business assets against having capital invested elsewhere.

The average RoA for participants across South Australia was 6.2% with the top 25% reaching 10.9%. This was an excellent result for South Australian dairy farmers showing a significant increase on last year when the average RoA was 0.6%.

Six farms posted greater than 8% RoA for the 2013/14 year with another four farms coming very close to this figure and were above 7% RoA. This is a representation of the strong performance of farms across the state mainly due to higher milk prices.

Figure 12. Return on assets

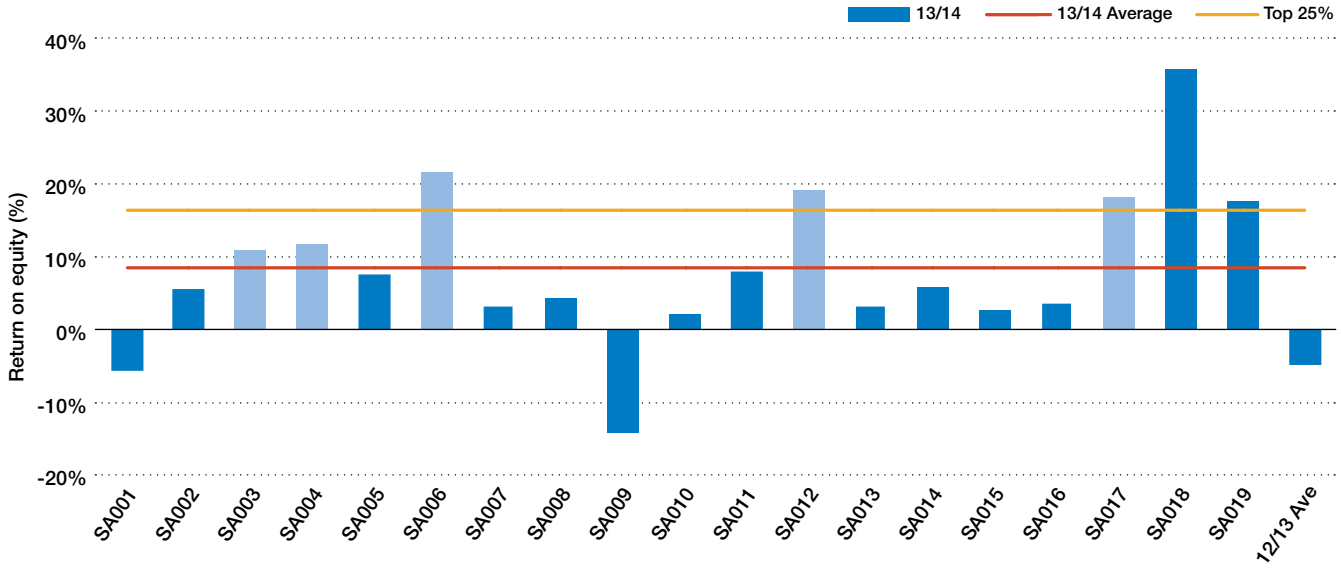


Return on equity (RoE) shows profit after interest and lease costs as a percentage of net worth, which indicates how well the business is generating a profit from its own equity. Items not accounted for in return on equity include capital expenditure, principal loan repayments and tax.

Return on equity averaged 8.5% for 2013/14 with a wide variance, ranging from -14.3% to 35.8% (Figure 13 below). This result is in stark contrast to the 2012/13 report which showed an average RoE of -4.9% with only two farms in positive territory.

For more information Appendix 1 presents the RoA and RoE for all participant farms.

Figure 13. Return on equity



Physical measures

Feed data was collected on a whole farm basis rather than determining which feeds went to each class of stock as this would have made the data collection process too difficult on many farms.

Feed consumption and fertiliser

Pasture consumption is calculated as the gap between the total energy required on farm for all stock 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 on page 39 under Glossary of Terms.

Pasture grazed accounted for the largest source of metabolisable energy (ME) fed to livestock at an average of 45% of total ME. The middle 50% band of farms saw a range of between 31% and 57% of ME fed as pasture. There was quite an extreme range observed this year between 0% (for Total Mixed Ration or TMR dairies) to 85% of total ME sourced from pasture grazed.

The estimated grazed pasture equated to an average of 7.9t DM/ha with 0.9t DM/ha (11%) being conserved for fodder. The range of home grown feed consumed per milking hectare varied greatly between South Australian producers (Figure 14).

Concentrates were the next highest source of total ME with an average of 30% of total ME fed. Although prices of concentrates were high, it did not deter feeding high volume(s) of quality grain as milk prices made higher feeding levels more attractive.

It should be noted that there can be a number of sources of error in the method used to calculate home pasture consumption. These errors include incorrect estimation of liveweight, amounts of fodder and concentrates fed, energy content of fodder and concentrates, energy content of pasture, wastage of feed and associative effects of feeds. Comparing pasture consumption estimated using the back calculation method between farms can lead to incorrect conclusions due to errors in each farms estimate. It is best to compare pasture consumption on the same farm over time using the same method of estimation.

Figure 14. Sources of whole farm metabolisable energy

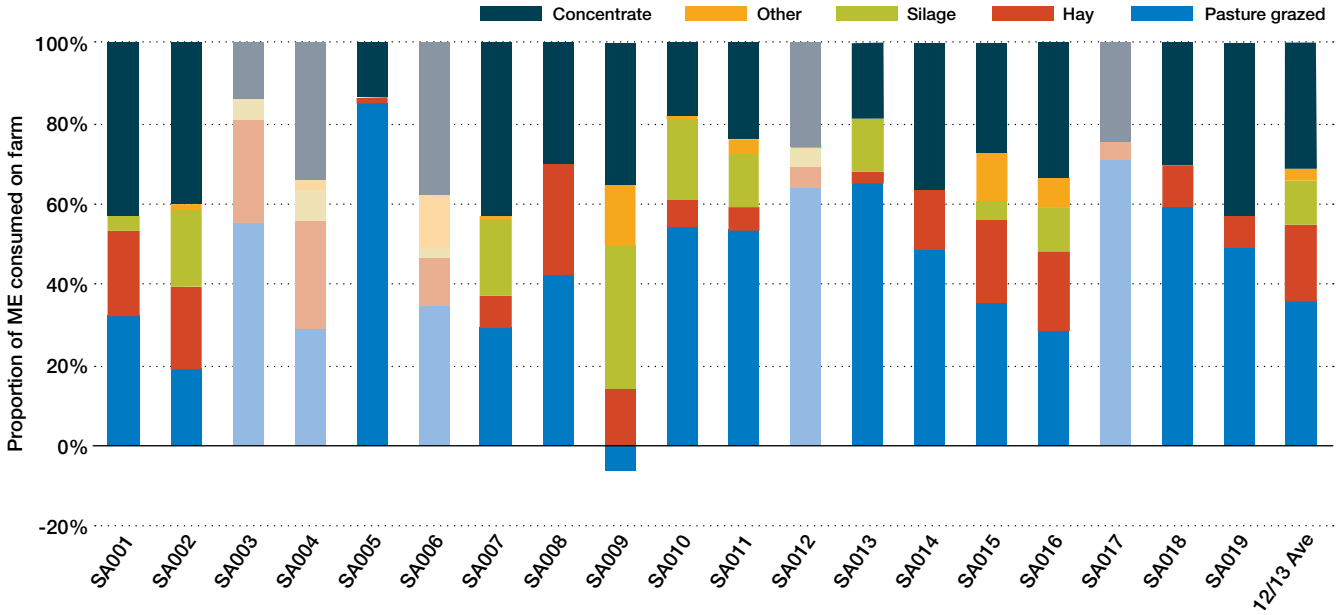
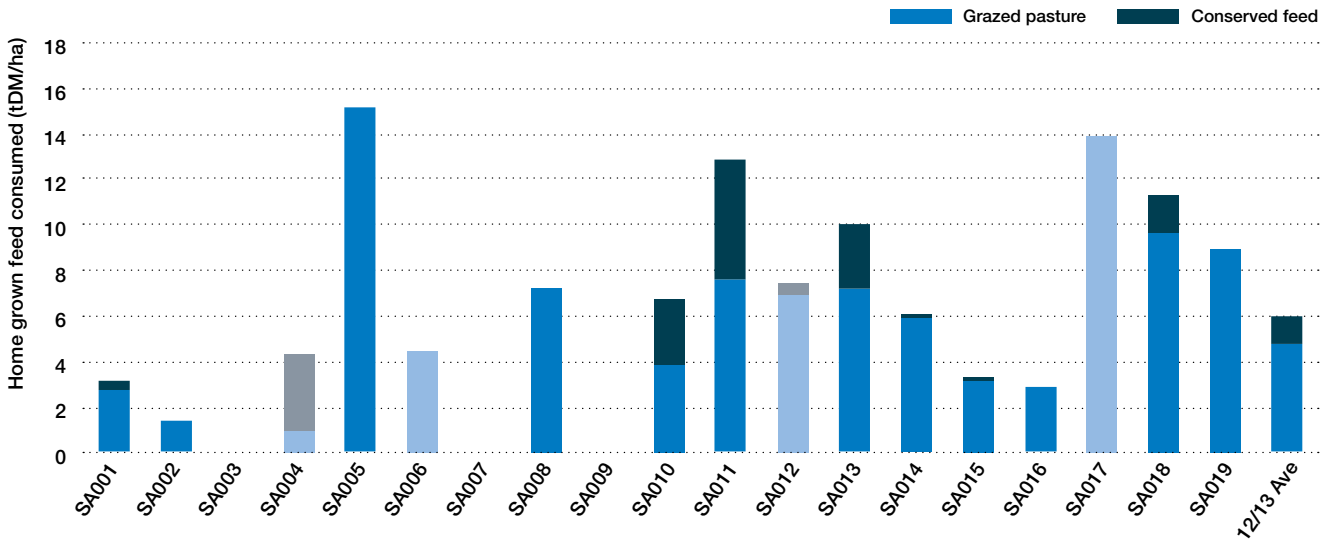


Figure 15 shows the volume of home feed consumed. Farms SA003, SA007 and SA009 can be considered feedlots. They have outlying figures (74t DM/ha, 88t DM/ha and –113t DM/ha) that distorted the nature of the graph and hence been omitted.

The amount of pasture grazed this year averaged 7.9t DM/ha well up on last year's 4.8t DM/ha (64% increase). This increase in pasture grazed in 2013/14 is a reflection of improved seasonal conditions and higher than average rainfall. Fodder conservation ranged from 0t DM/ha to 5.3t DM/ha and over the state averaged 0.9t DM/ha.

Despite increased pasture production, the proportion of concentrate feeding as a percentage of ME only slightly decreased on last year from 31% of total ME to 30% in 2013/14.

Figure 15. Estimated tonnes of home grown feed consumed per milking hectare



Fertiliser application

Dairy farms across South Australia used a wide variety of fertilisers and application rates. Nitrogen was the most highly applied nutrient with an average of 61.5kg/ha being applied on participant farms. The range in use of nitrogen was quite significant, ranging from 5 to 213kg/ha and was applied at the higher rates on irrigated pastures.

The average annual nutrient rates across all farms are shown in the Table 3 below.

Fertilisers used on dryland pastures were Urea and Diammonium Phospate (DAP) which are both leading sources of nitrogen. Irrigators elected to fertilise more frequently using custom fertilisers to optimise feed growth.

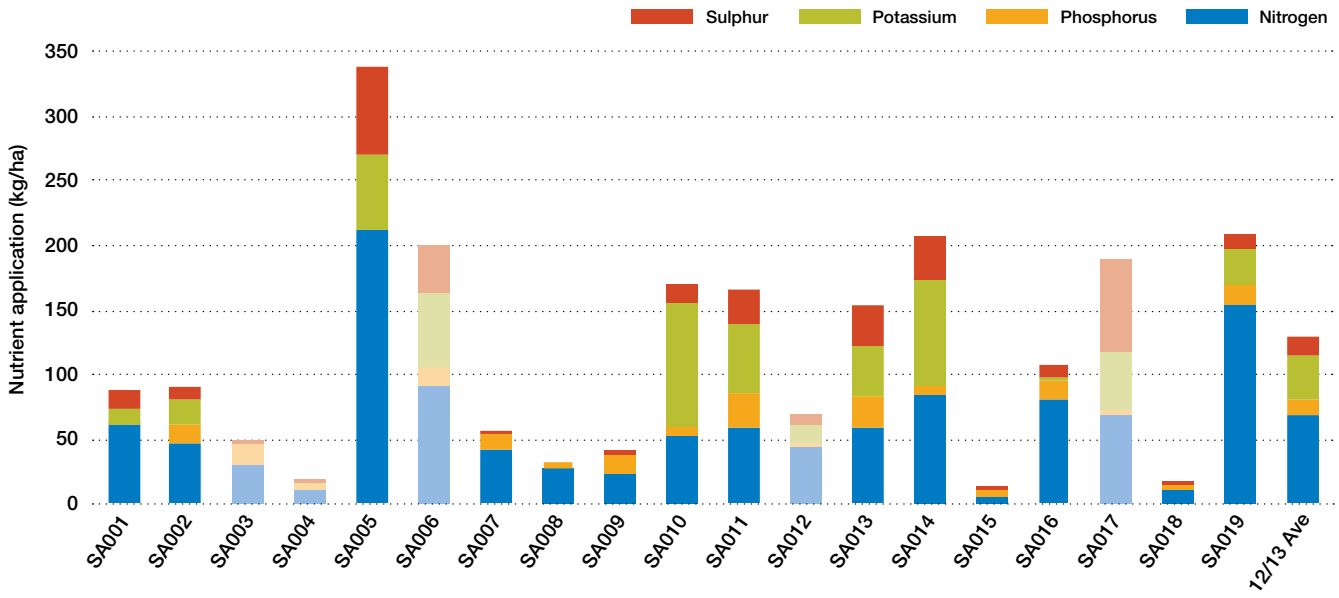
Table 3. Fertiliser use

	2012/13	2013/14
Nitrogen kg/ha	70	61
Phosphorus kg/ha	11	10
Potassium kg/ha	32	27
Sulphur kg/ha	15	18

Figure 16 below 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.

There was a correlation between the amount of home grown feed consumed and fertiliser applied, which may have also been assisted by rainfall and irrigation. Higher fertiliser applications were used on farms where there was irrigation over summer.

Figure 16. Fertiliser application (kg/ha)



IV. Business confidence survey

Expectations and issues

Farmers were interviewed to seek their expectations of income and expenses over the next year. Questions about medium and long term concerns amongst farmers were also asked revealing recurring issues faced by farmers in the future.

Expectation for business returns

Responses to the survey took into consideration all aspects of farming including climate, market prices for sales and expenditure.

While expectations varied across all categories, participants were slightly more negative about returns in 2014/15 after such a strong performing year in 2013/14 as shown in Figure 17.

At the time of data collection, farmers had already received the 2014/15 milk prices which were lower than in 2013/14 and showed no indication of increasing. Optimism for improved farm business return came from farmers expecting to make changes to management and operating systems to increase returns.

Price and production expectations: Milk

The majority of farmers expected their milk price for 2014/15 to decrease (Figure 18). The extent of the decrease was not known as it followed an extremely high price received by farmers in 2013/14.

Although a decrease in price was anticipated, an increase in production was expected by over 60% of participants. This would be unlikely to offset the lower milk price.

Figure 17. Expectation of business returns

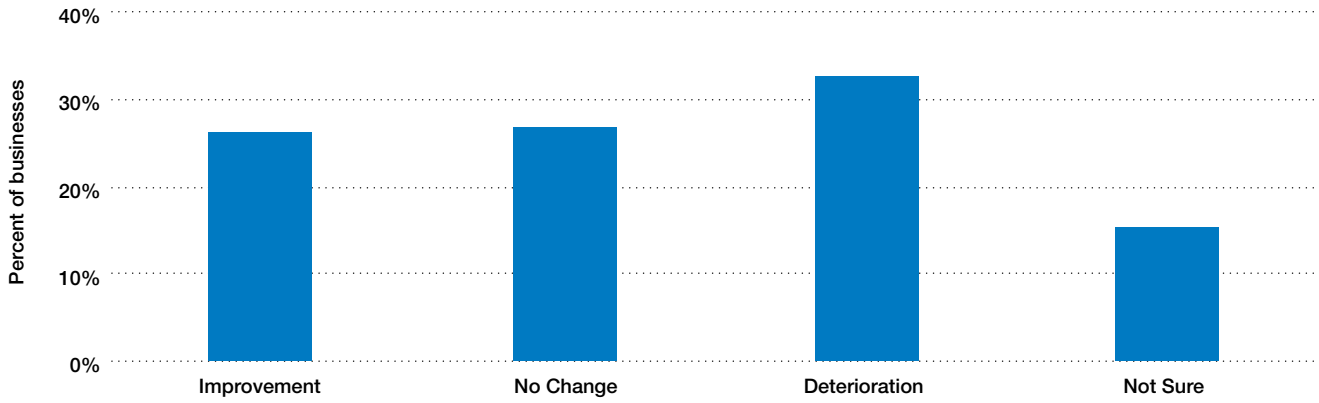
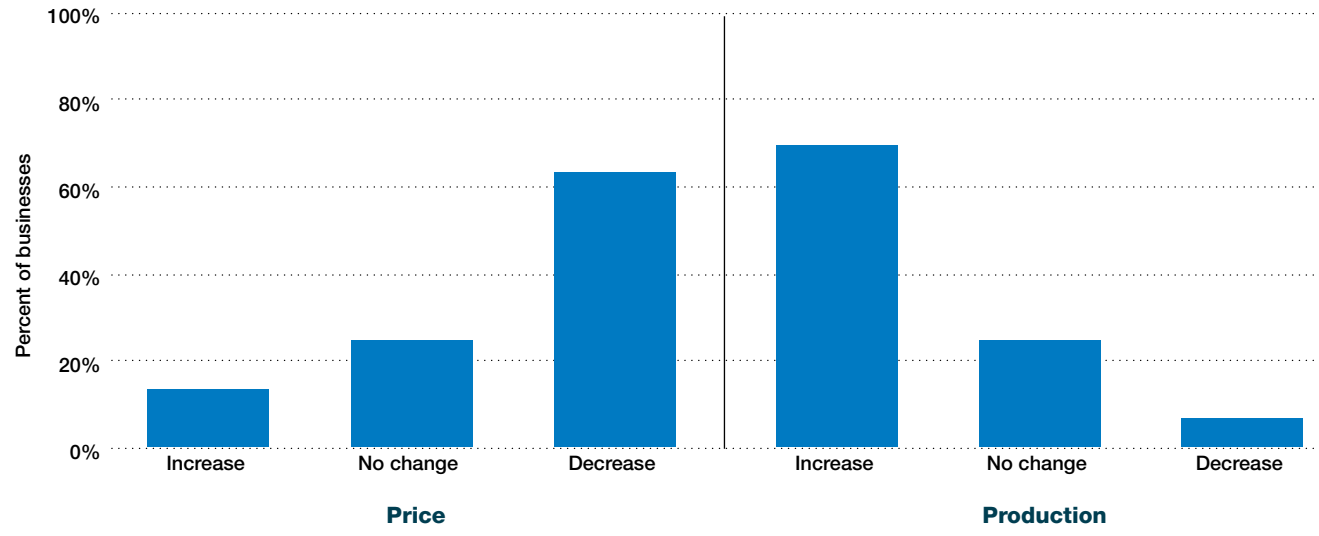


Figure 18. Price and production expectations: Milk



Price and production expectations: Fodder

With fodder prices still quite high in the 2013/14 reporting year, over 60% of farmers (Figure 19) believed prices would remain constant for the 2014/15 financial year. Participants planned to increase fodder production for 2014/15, some of which some will come from introducing more irrigation into current operating systems.

Cost expectations

Data represented in Figure 20 is the expectations of costs for the dairy industry taken from the 19 South Australian dairy farms. On balance, dairy farmers expected costs to increase for labour, fuel and oil. The other key costs surveyed—fertiliser, irrigation costs, and repairs and maintenance—were anticipated by dairy farmers not to change in the next year. R&M costs had an evenly spread range of answers among farmers. Many farmers increased the amount of repairs and maintenance in 2013/14 or replaced machinery which is the reason for some farmers suggesting a decrease in cost for next year. Others expected no changes to the volume of repairs and maintenance but expected the cost of materials to rise.

Participants expected the prices of energy to increase with anticipated price rises for fuel, oil and irrigation.

Figure 19. Price and production expectations: Fodder

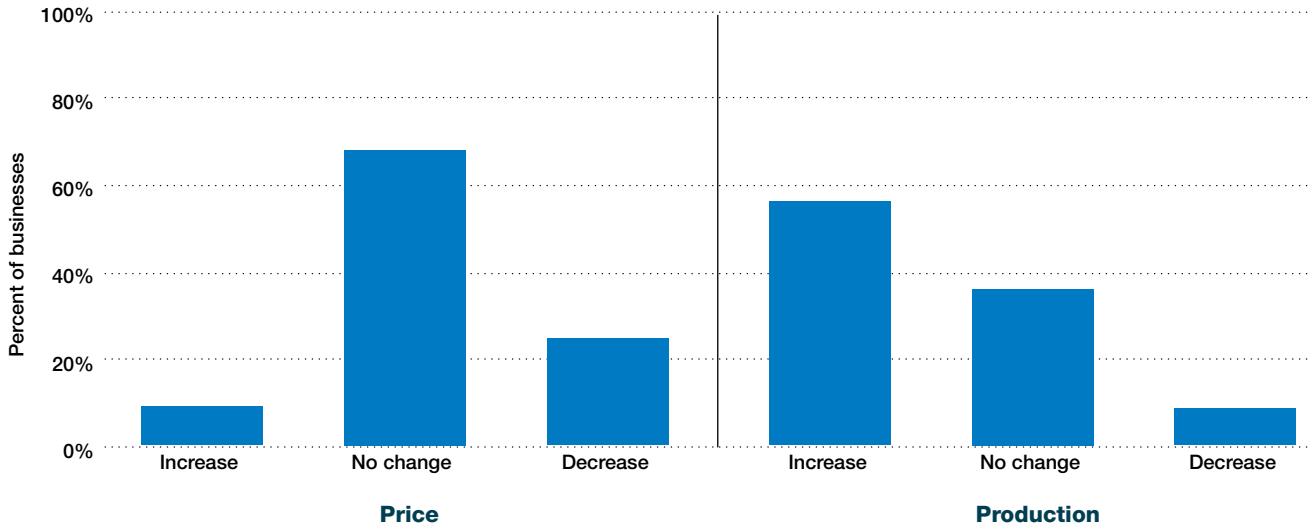
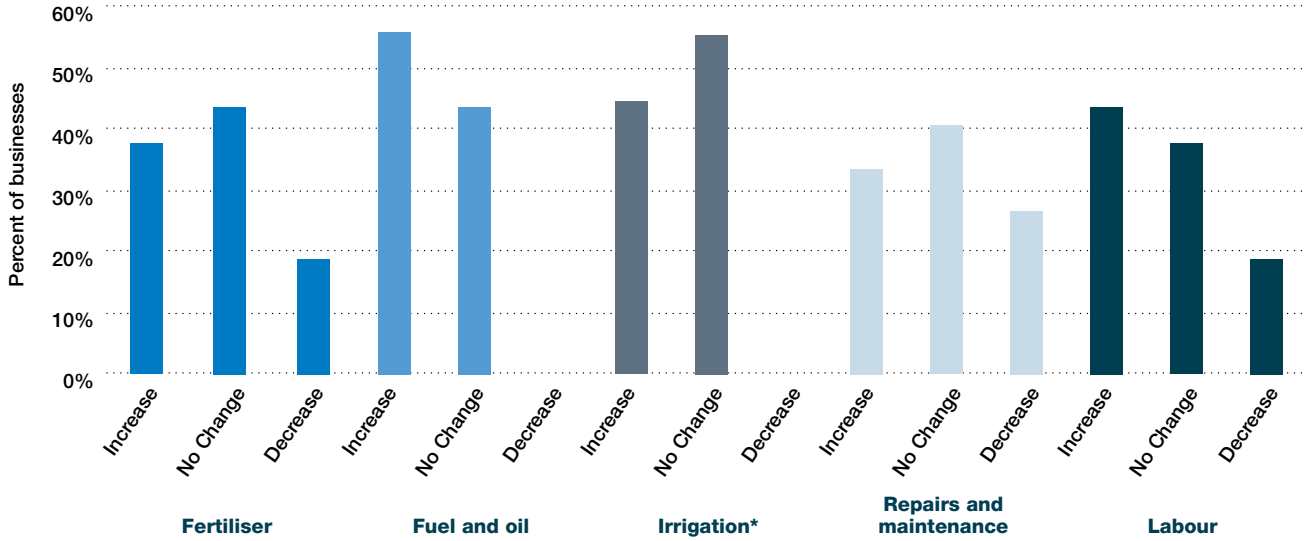


Figure 20. Cost expectations

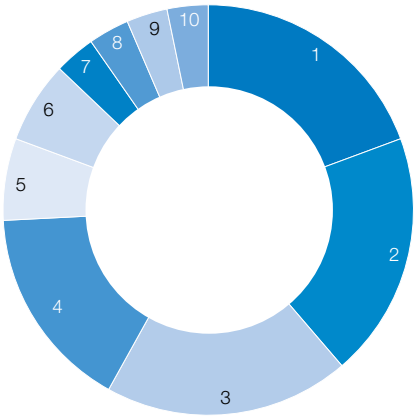


Major issues facing the dairy industry: The next 12 months

A summary of the key issues identified by participants for the next 12 month period is summarised in Figure 21 below. Farm development, input costs, physical performance, labour and milk prices were the key concerns for 2014/15.

Farm development, milk prices and input costs were of equal largest concern with 19% of responses each. Concerns regarding farm labour were also relatively high at 16%.

Figure 21. Major issues facing the dairy industry: The next 12 months



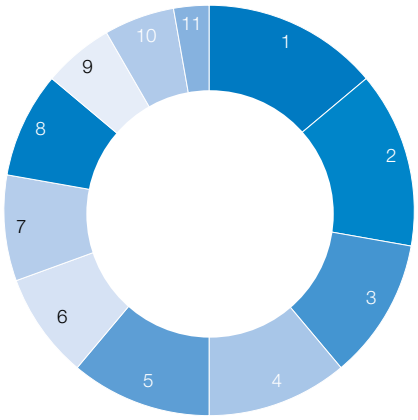
1	Farm development
2	Input costs
3	Milk prices
4	Labour
5	Climate/weather variability
6	Debt management
7	Physical performance
8	Succession
9	Water
10	Work-life balance

Major issues facing the dairy industry: The next five years

Figure 22 below shows the longer term issues identified for the next five years. Farm succession planning was one of the major concerns, accounting for 14% of feedback, along with concerns over irrigation water. These issues only accounted for 3% each, of concerns over the next 12 months.

Interestingly, farm development, input costs and milk prices scored highly again with each issue accounting for 11%.

Figure 22. Major issues facing the dairy industry: The next five years



1	Succession
2	Water
3	Farm development & investment
4	Input costs
5	Milk prices
6	Climate/weather variability
7	Labour
8	Physical performance
9	Debt management
10	Economic & political pressure
11	Cash flow

V. Greenhouse

2013/14 Greenhouse gas emissions

The analysis of greenhouse gas emissions from participating farms is based on the Australian National Greenhouse Gas Inventory method. This model was developed to predict the magnitude and source of greenhouse gasses emitted from a dairy farm. The initial analysis template was sourced from Melbourne University's greenhouse in agriculture website (greenhouse.unimelb.edu.au), which provides decision support frameworks for greenhouse accounting on Australian dairy, sheep, beef and grain farms. While comprehensive, this analysis should not be assumed exact, but used as indicative only.

Carbon dioxide equivalents (CO_2-e) are used to standardise the greenhouse gas potential from different gasses. The Global Warming Potential (GWP) is the index used to convert relevant non-carbon dioxide gasses to a carbon dioxide equivalent. This is calculated by multiplying the quantity of the gas by its GWP. All of the data in this section is in CO_2-e tonnes.

The GWP for the three gasses that are noted in this report are: 1:21:310 (CO_2 : CH_4 : N_2O). This means that one CO_2-e tonne equates to 47.6 kg of methane (CH4) and 3.2 kg of nitrous oxide (N_2O)

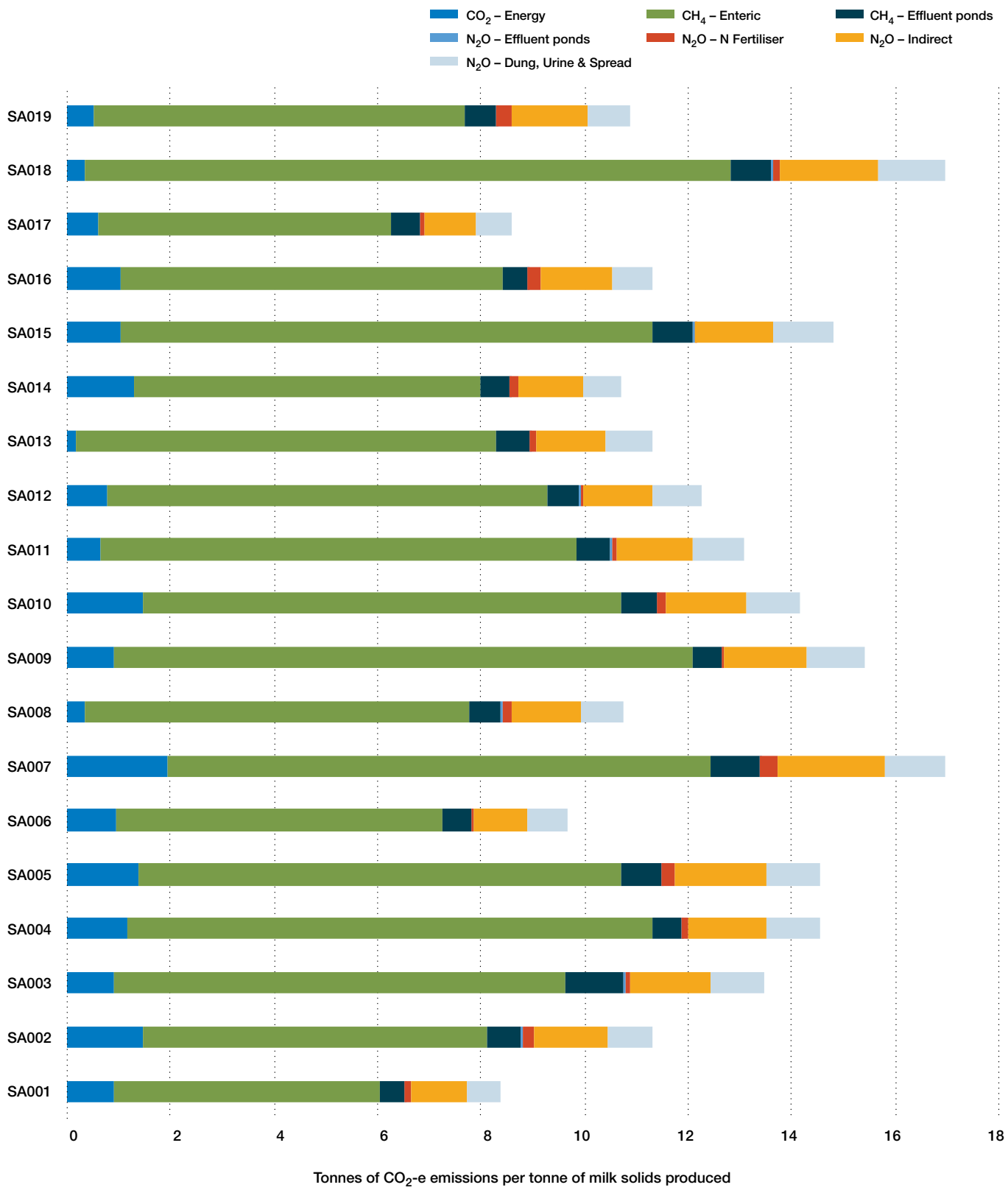
Methane (CH_4) was identified as the main greenhouse gas emitted from dairy farms, accounting for 72% of all greenhouse gas emissions, as seen in Figure 23. There are two main sources: on farm ruminant digestion and anaerobic digestion in effluent management systems. Methane produced from ruminant digestion is known as enteric methane and was the major source of emissions from all farms in this report, with an average of 67% of total emissions. Methane from effluent ponds accounted for 5% of emissions.

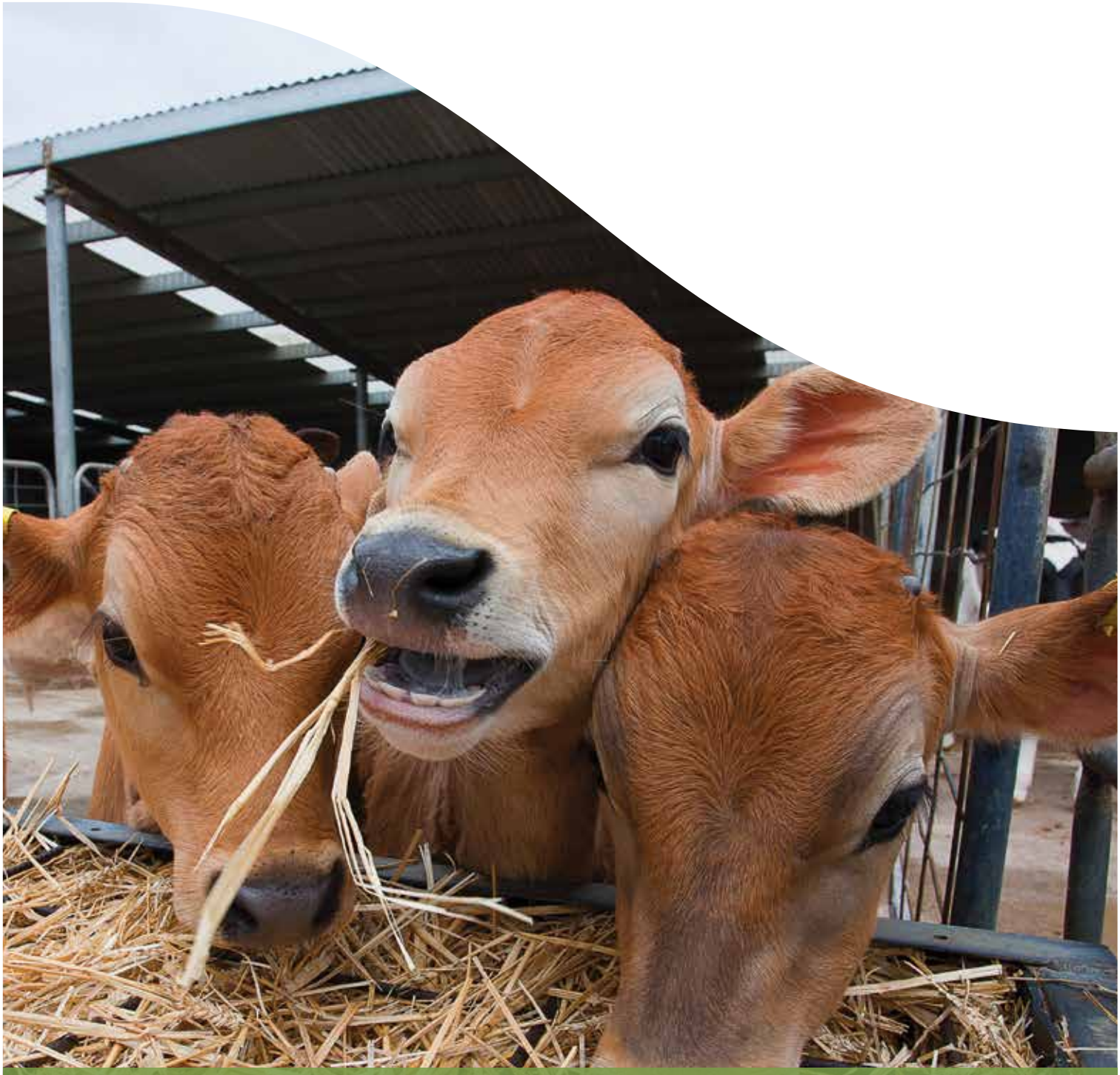
The second main greenhouse gas emission was nitrous oxide (N_2O) which accounted for 20% of total emissions or 2.6t CO_2-et/MS. Nitrous oxide emissions in dairy farms are sourced primarily from direct emissions; including nitrogen fertiliser application, effluent management systems and animal excreta (dung and urine), as well as indirect emissions such as that from ammonia and nitrate loss in soils.

The third main greenhouse gas emission is carbon dioxide (CO_2), which is produced primarily from fossil fuel consumption as either electricity or petrochemicals. CO_2 accounted for 7% or 0.9t CO_2-e/t MS. Output levels were highly dependent on sources of electricity. Renewable energy sources however can cut emissions significantly. There are also a number of technologies available to improve energy efficiency in the dairy while reducing electricity costs.

We are currently seeing the importance of understanding and monitoring greenhouse gas emissions and this will potentially become even more essential in the near future. To find detailed information on the Australian National Greenhouse Gas Inventory, sources and strategies for reducing greenhouse gasses on dairy farms, visit the Department of Environment's website at climatechange.com.au.

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





VI. Appendices

South Australia summary tables

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	%	%
SA001	$7.11	$0.56	$7.67	$3.96	$3.34	54%	$0.37	1.4%	$0.90	11.8%	-$0.54	-5.8%	-6.0%
SA002	$6.61	$0.33	$6.94	$3.57	$2.42	60%	$0.94	4.8%	$0.01	0.1%	$0.93	5.7%	5.6%
SA003	$6.96	$1.79	$8.75	$4.84	$2.02	71%	$1.90	9.1%	$0.17	2.0%	$1.72	10.9%	11.5%
SA004	$7.16	$1.18	$8.35	$3.84	$2.63	59%	$1.87	9.7%	$0.38	4.5%	$1.50	11.7%	32.3%
SA005	$6.44	$0.37	$6.81	$2.80	$2.14	57%	$1.87	7.8%	$0.00	0.0%	$1.87	7.8%	7.7%
SA006	$7.31	$0.88	$8.19	$4.26	$1.84	70%	$2.09	10.5%	$0.00	0.0%	$2.09	21.7%	13.0%
SA007	$6.99	$3.73	$10.72	$4.91	$4.24	54%	$1.57	4.2%	$0.87	8.1%	$0.71	3.0%	3.1%
SA008	$6.29	-$0.21	$6.08	$2.59	$2.32	53%	$1.17	4.2%	$0.09	1.4%	$1.08	4.4%	4.4%
SA009	$6.46	$1.53	$7.99	$4.03	$9.05	31%	-$5.09	-7.4%	$1.16	14.6%	-$6.25	-14.3%	-14.4%
SA010	$6.67	$0.54	$7.21	$3.32	$2.45	58%	$1.44	3.9%	$0.95	13.1%	$0.49	2.1%	1.9%
SA011	$6.99	$0.72	$7.71	$2.68	$2.71	50%	$2.32	7.0%	$0.19	2.5%	$2.13	8.0%	8.1%
SA012	$7.21	$0.67	$7.88	$3.81	$1.94	66%	$2.13	10.0%	$0.86	10.9%	$1.27	19.2%	19.9%
SA013	$6.54	$1.25	$7.79	$2.79	$3.67	43%	$1.33	3.2%	$0.16	2.1%	$1.17	3.0%	3.0%
SA014	$6.57	$0.59	$7.16	$3.79	$1.93	66%	$1.43	7.9%	$0.48	6.7%	$0.95	5.9%	6.1%
SA015	$7.12	$0.44	$7.56	$4.08	$2.27	64%	$1.21	5.5%	$0.82	10.9%	$0.39	2.6%	2.8%
SA016	$6.92	$1.29	$8.21	$3.99	$3.20	56%	$1.02	4.4%	$0.57	6.9%	$0.46	3.7%	3.8%
SA017	$6.62	$0.44	$7.06	$2.10	$1.67	56%	$3.30	14.9%	$0.40	5.6%	$2.90	18.2%	13.0%
SA018	$6.98	$0.31	$7.29	$2.68	$2.90	48%	$1.71	7.3%	$0.89	12.2%	$0.83	$0.36	36.4%
SA019	$6.85	$0.76	$7.61	$4.52	$1.51	74.9%	$1.58	8.6%	$0.97	12.7%	$0.61	17.6%	19.7%
Average	$6.83	$0.90	$7.74	$3.61	$2.85	57.3%	$1.27	6.2%	$0.52	6.6%	$0.75	8.5%	9.0%
Top 25%	$7.05	$0.99	$8.05	$3.77	$2.02	64.3%	$2.26	10.9%	$0.36	4.6%	$1.90	16.3%	17.9%

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	%	%
SA001	90	90	742	110	1.2	665	813	4.7%	3.6%
SA002	532	250	671	295	0.6	657	364	3.9%	3.3%
SA003	331	12	602	316	1.0	380	363	4.7%	3.5%
SA004	1,218	300	509	503	0.4	462	191	4.1%	3.3%
SA005	174	173	1,451	676	3.9	344	1,336	4.4%	3.4%
SA006	180	170	869	328	1.8	561	1,022	3.6%	3.1%
SA007	751	9	519	341	0.5	369	167	4.0%	3.1%
SA008	444	84	550	266	0.6	470	282	4.1%	3.3%
SA009	69	1	642	141	2.0	270	551	4.8%	3.6%
SA010	252	208	915	306	1.2	483	587	4.0%	3.1%
SA011	208	118	1,209	324	1.6	438	682	3.7%	3.2%
SA012	296	296	1,443	639	2.2	493	1,063	3.1%	3.2%
SA013	322	194	1,279	389	1.2	435	526	4.2%	3.3%
SA014	245	152	965	410	1.7	541	905	4.0%	3.3%
SA015	314	100	625	312	1.0	351	349	3.7%	3.2%
SA016	381	103	861	350	0.9	632	580	3.6%	3.3%
SA017	126	123	1,520	453	3.6	460	1,649	4.5%	3.6%
SA018	3,680	520	700	1,846	0.5	298	149	3.8%	3.3%
SA019	381.3	210.0	964.7	608.0	1.6	598.1	954	3.6%	3.2%
Average	526.0	163.9	896.7	453.3	1.4	468.6	660	4.0%	3.3%
Top 25%	430.3	180.2	988.6	447.8	1.8	470.8	857	4.0%	3.4%

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
SA001	2.8	0.4	36%	60.3	0.4	12.6	13.8	34	22,315
SA002	1.3	0.0	46%	47.8	13.2	20.1	9.3	56	37,095
SA003	73.9	0.0	58%	30.8	15.7	0.0	1.3	129	49,102
SA004	0.9	3.4	37%	11.2	5.3	0.0	0.4	82	37,786
SA005	15.1	0.0	85%	212.6	0.0	57.5	69.5	178	61,172
SA006	4.5	0.0	35%	91.8	14.3	57.3	36.6	80	44,641
SA007	88.0	0.0	50%	41.8	12.3	0.0	0.3	80	29,384
SA008	7.2	0.0	60%	27.2	5.9	0.0	0.0	120	56,359
SA009	-113.3	0.0	44%	23.7	14.3	0.0	3.4	27	7,178
SA010	3.9	2.9	74%	52.8	6.7	96.5	14.2	89	43,154
SA011	7.6	5.3	67%	59.1	26.1	53.5	26.9	84	36,850
SA012	6.9	0.5	66%	44.2	3.0	14.3	8.1	204	100,644
SA013	7.2	2.9	79%	58.7	24.3	38.2	32.6	71	31,120
SA014	5.9	0.2	49%	84.7	7.3	81.4	33.5	85	45,803
SA015	3.2	0.1	54%	5.5	6.1	0.0	0.5	127	44,510
SA016	2.9	0.0	52%	80.6	15.6	1.7	9.2	87.6	55,334
SA017	13.9	0.0	71%	69.2	3.6	45.5	71.4	119.9	55,116
SA018	9.7	1.6	70%	10.7	4.3	0.0	0.3	163.4	48,688
SA019	8.9	0.0	49%	154.8	14.7	27.8	11.4	182.1	108,919
Average	7.9	0.9	57%	94.2	10.2	26.6	18.0	105.2	48,167
Top 25%	20.0	0.8	53%	174.0	8.4	23.4	23.6	123.0	57,458

*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
SA001	4.2	$478		$212		$370	12.2	3.2	64%
SA002	4.0	$398	$149	$156	$1,256	$380	11.2	3.5	54%
SA003	3.3	$421	$177	$192		$291	7.9	4.0	42%
SA004	4.5	$368		$257	$60	$304	12.3	2.7	63%
SA005	0.7	$324		$226		$306	12.8	2.5	15%
SA006	4.4	$399	$217	$286	$211	$320	11.9	3.0	65%
SA007	2.1	$302		$59	$141	$242	10.2	2.5	50%
SA008	1.8	$293				$293	12.3	2.4	40%
SA009	2.4	$343			$50	$243	12.2	2.1	56%
SA010	2.4	$389		$279		$348	11.3	3.2	26%
SA011	1.7	$336		$114	$116	$287	12.6	2.4	33%
SA012	2.8	$329	$444	$220	$556	$318	12.5	2.7	34%
SA013	1.1	$309		$235		$298	13.1	2.3	21%
SA014	3.3	$279		$270	$863	$284	11.8	2.5	51%
SA015	3.0	$334		$188	$142	$242	11.4	2.3	46%
SA016	4.2	$390		$294	$229	$338	12.4	2.8	48%
SA017	1.3	$262		$222		$253	12.8	2.0	29%
SA018	1.4	$240				$240	12.9	1.9	30%
SA019	3.7	$324		$241		$299	11.8	2.7	51%
Average	2.7	$343	$247	$216	$362	$298	11.9	2.7	43%
Top 25%	3.3	$356	$168	$235	$165	$297	11.5	2.9	47%

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
SA001	$0.18	$0.18	$0.00	$0.15	$0.20	$0.71	$0.22	$0.00	$0.01
SA002	$0.07	$0.10	$0.00	$0.08	$0.11	$0.35	$0.41	$0.00	$0.10
SA003	$0.04	$0.10	$0.00	$0.13	$0.09	$0.37	$0.21	$0.33	$0.19
SA004	$0.11	$0.09	$0.00	$0.13	$0.11	$0.44	$0.18	$0.03	$0.00
SA005	$0.12	$0.34	$0.02	$0.15	$0.03	$0.67	$0.51	$0.52	$0.00
SA006	$0.12	$0.15	$0.11	$0.16	$0.18	$0.72	$0.28	$0.00	$0.11
SA007	$0.09	$0.15	$0.00	$0.16	$0.17	$0.56	$0.42	$0.40	$0.39
SA008	$0.11	$0.13	$0.00	$0.14	$0.06	$0.44	$0.29	$0.13	$0.05
SA009	$0.18	$0.05	$0.02	$0.34	$0.20	$0.79	$0.15	$0.09	$0.06
SA010	$0.14	$0.17	$0.00	$0.20	$0.08	$0.59	$0.45	$0.00	$0.18
SA011	$0.05	$0.12	$0.03	$0.14	$0.06	$0.42	$0.27	$0.11	$0.31
SA012	$0.10	$0.11	$0.01	$0.21	$0.10	$0.54	$0.43	$0.34	$0.21
SA013	$0.11	$0.07	$0.02	$0.18	$0.14	$0.54	$0.49	$0.22	$0.36
SA014	$0.13	$0.36	$0.22	$0.31	$0.00	$1.02	$0.48	$0.00	$0.14
SA015	$0.11	$0.17	$0.00	$0.15	$0.14	$0.56	$0.03	$0.00	$0.49
SA016	$0.17	$0.13	$0.01	$0.11	$0.01	$0.44	$0.25	$0.00	$0.31
SA017	$0.12	$0.16	$0.02	$0.11	$0.03	$0.44	$0.53	$0.07	$0.01
SA018	$0.11	$0.06	$0.01	$0.15	$0.06	$0.39	$0.16	$0.76	$0.00
SA019	$0.17	$0.30	$0.11	$0.11	$0.13	$0.81	$0.65	$0.01	$0.46
Average	$0.12	$0.16	$0.03	$0.16	$0.10	$0.57	$0.34	$0.16	$0.18
Top 25%	$0.10	$0.12	$0.03	$0.15	$0.10	$0.50	$0.33	$0.16	$0.10

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
SA001	$0.09	$0.14	$0.09	$0.58	$1.78	$0.34	$3.26	$3.96
SA002	$0.23	$0.12	$0.07	$0.25	$2.05	$0.00	$3.22	$3.57
SA003	$0.18	$0.14	$0.00	$1.67	$1.62	$0.13	$4.47	$4.84
SA004	$0.22	$0.00	$0.00	$1.12	$1.84	$0.00	$3.40	$3.84
SA005	$0.11	$0.09	$0.00	$0.11	$0.52	$0.27	$2.13	$2.80
SA006	$0.16	$0.24	$0.00	$0.72	$1.87	$0.17	$3.54	$4.26
SA007	$0.68	$0.87	$0.07	$0.06	$1.45	$0.00	$4.34	$4.91
SA008	$0.19	$0.26	$0.06	$0.00	$1.18	$0.00	$2.15	$2.59
SA009	$0.51	$0.11	$0.04	$0.00	$2.17	$0.11	$3.24	$4.03
SA010	$0.12	$0.17	$0.02	$0.52	$1.27	$0.00	$2.73	$3.32
SA011	$0.19	$0.20	$0.02	$0.04	$1.12	$0.00	$2.26	$2.68
SA012	$0.05	$0.17	$0.00	$0.48	$1.55	$0.03	$3.27	$3.81
SA013	$0.11	$0.17	$0.14	$0.09	$0.67	$0.00	$2.25	$2.79
SA014	$0.10	$0.13	$0.08	$0.58	$1.27	$0.00	$2.78	$3.79
SA015	$0.11	$0.26	$0.27	$0.32	$1.75	$0.29	$3.52	$4.08
SA016	$0.17	$0.24	$0.11	$0.57	$1.90	$0.00	$3.56	$3.99
SA017	$0.06	$0.07	$0.01	$0.17	$0.60	$0.14	$1.66	$2.10
SA018	$0.17	$0.09	$0.00	$0.00	$1.12	$0.00	$2.29	$2.68
SA019	$0.25	$0.16	$0.19	$0.59	$1.39	$0.00	$3.70	$4.52
Average	$0.20	$0.19	$0.06	$0.41	$1.43	$0.08	$3.04	$3.61
Top 25%	$0.13	$0.12	$0.00	$0.83	$1.49	$0.09	$3.27	$3.77

Table A5. Overhead costs

Farm number	Rates	Registration & insurance	Farm insurance	Repairs & 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
SA001	$0.05	$0.01	$0.08	$0.12	$0.00	$0.17	$0.13	$0.55	$0.26	$2.53	$3.34
SA002	$0.06	$0.01	$0.08	$0.38	$0.00	$0.14	$0.44	$1.12	$0.19	$1.11	$2.42
SA003	$0.04	$0.00	$0.06	$0.27	$0.07	$0.08	$0.48	$1.01	$0.19	$0.82	$2.02
SA004	$0.03	$0.02	$0.04	$0.30	$0.10	$0.14	$0.85	$1.47	$0.21	$0.95	$2.63
SA005	$0.03	$0.00	$0.07	$0.36	$0.01	$0.10	$0.54	$1.11	$0.58	$0.44	$2.14
SA006	$0.03	$0.06	$0.00	$0.23	$0.01	$0.14	$0.71	$1.17	$0.14	$0.52	$1.84
SA007	$0.08	$0.00	$0.25	$1.16	$0.01	$0.27	$0.63	$2.40	$0.39	$1.45	$4.24
SA008	$0.08	$0.00	$0.05	$0.37	$0.00	$0.10	$0.28	$0.90	$0.55	$0.87	$2.32
SA009	$0.09	$0.10	$0.21	$0.62	$0.13	$0.46	$1.97	$3.58	$0.75	$4.72	$9.05
SA010	$0.08	$0.00	$0.10	$0.50	$0.01	$0.13	$0.55	$1.36	$0.22	$0.87	$2.45
SA011	$0.05	$0.03	$0.07	$0.48	$0.00	$0.25	$1.47	$2.34	$0.15	$0.22	$2.71
SA012	$0.02	$0.02	$0.03	$0.29	$0.00	$0.52	$0.86	$1.74	$0.20	$0.00	$1.94
SA013	$0.06	$0.02	$0.04	$0.43	$0.04	$0.13	$0.41	$1.14	$0.92	$1.61	$3.67
SA014	$0.10	$0.00	$0.06	$0.25	$0.00	$0.22	$0.89	$1.53	$0.09	$0.31	$1.93
SA015	$0.06	$0.02	$0.18	$0.25	$0.17	$0.13	$0.02	$0.84	$0.10	$1.32	$2.27
SA016	$0.43	$0.07	$0.12	$0.40	$0.03	$0.05	$0.64	$1.74	$1.11	$0.35	$3.20
SA017	$0.02	$0.00	$0.04	$0.08	$0.00	$0.12	$1.04	$1.31	$0.35	$0.00	$1.67
SA018	$0.44	$0.00	$0.03	$0.31	$0.00	$0.06	$1.86	$2.69	$0.11	$0.10	$2.90
SA019	$0.03	$0.01	$0.04	$0.27	$0.00	$0.33	$0.62	$1.32	$0.20	$0.00	$1.51
Average	$0.09	$0.02	$0.08	$0.37	$0.03	$0.19	$0.76	$1.54	$0.35	$0.96	$2.85
Top 25%	$0.03	$0.02	$0.04	$0.23	$0.04	$0.20	$0.79	$1.34	$0.22	$0.46	$2.02

Table A6. 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
	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs
SA001	2.4%	2.5%	0.0%	2.0%	2.7%	9.7%	3.0%	0.0%	0.2%
SA002	1.2%	1.6%	0.0%	1.3%	1.9%	5.9%	6.8%	0.0%	1.7%
SA003	0.6%	1.5%	0.0%	2.0%	1.3%	5.4%	3.1%	4.9%	2.7%
SA004	1.7%	1.4%	0.0%	2.0%	1.7%	6.8%	2.8%	0.5%	0.0%
SA005	2.4%	7.0%	0.5%	3.1%	0.7%	13.6%	10.2%	10.5%	0.0%
SA006	1.9%	2.5%	1.8%	2.7%	2.9%	11.8%	4.6%	0.0%	1.8%
SA007	0.9%	1.6%	0.0%	1.7%	1.9%	6.2%	4.6%	4.3%	4.3%
SA008	2.3%	2.6%	0.0%	2.8%	1.2%	8.9%	5.9%	2.6%	1.0%
SA009	1.4%	0.4%	0.2%	2.6%	1.5%	6.0%	1.2%	0.7%	0.4%
SA010	2.4%	3.0%	0.0%	3.5%	1.5%	10.3%	7.8%	0.0%	3.2%
SA011	1.0%	2.3%	0.6%	2.6%	1.2%	7.7%	5.1%	2.1%	5.7%
SA012	1.8%	2.0%	0.2%	3.7%	1.7%	9.4%	7.6%	6.0%	3.7%
SA013	1.7%	1.1%	0.4%	2.9%	2.2%	8.3%	7.6%	3.4%	5.6%
SA014	2.3%	6.2%	3.9%	5.4%	0.0%	17.8%	8.4%	0.0%	2.4%
SA015	1.7%	2.6%	0.0%	2.3%	2.2%	8.8%	0.5%	0.0%	7.7%
SA016	2.3%	1.9%	0.2%	1.6%	0.1%	6.1%	3.5%	0.0%	4.3%
SA017	3.2%	4.3%	0.6%	2.8%	0.9%	11.8%	14.0%	1.9%	0.2%
SA018	1.9%	1.2%	0.2%	2.7%	1.0%	6.9%	2.8%	9.9%	0.0%
SA019	2.8%	4.9%	1.8%	1.8%	2.2%	13.5%	10.8%	0.1%	7.6%
Average	1.9%	2.7%	0.5%	2.6%	1.5%	9.2%	5.8%	2.5%	2.8%
Top 25%	1.9%	2.3%	0.5%	2.6%	1.7%	9.0%	6.4%	2.6%	1.7%

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
SA001	1.3%	1.9%	1.2%	7.9%	24.3%	4.7%	44.6%	54.3%
SA002	3.8%	2.0%	1.1%	4.1%	34.1%	0.0%	53.7%	59.6%
SA003	2.7%	2.1%	0.0%	24.4%	23.6%	1.8%	65.2%	70.6%
SA004	3.5%	0.1%	0.0%	17.3%	28.4%	0.0%	52.5%	59.3%
SA005	2.2%	1.9%	0.0%	2.2%	10.4%	5.5%	43.1%	56.7%
SA006	2.6%	3.9%	0.0%	11.8%	30.6%	2.8%	58.1%	69.9%
SA007	7.5%	9.5%	0.8%	0.7%	15.8%	0.0%	47.5%	53.7%
SA008	3.8%	5.3%	1.2%	0.0%	24.0%	0.0%	43.8%	52.8%
SA009	3.9%	0.8%	0.3%	0.0%	16.6%	0.9%	24.8%	30.8%
SA010	2.1%	2.9%	0.3%	9.0%	21.9%	0.0%	47.3%	57.5%
SA011	3.6%	3.6%	0.4%	0.7%	20.8%	0.0%	42.0%	49.7%
SA012	0.8%	3.0%	0.0%	8.4%	26.9%	0.5%	56.9%	66.2%
SA013	1.7%	2.7%	2.1%	1.4%	10.3%	0.0%	34.9%	43.1%
SA014	1.7%	2.2%	1.4%	10.1%	22.2%	0.0%	48.5%	66.3%
SA015	1.7%	4.1%	4.2%	5.1%	27.5%	4.6%	55.5%	64.3%
SA016	2.4%	3.4%	1.5%	7.9%	26.4%	0.0%	49.5%	55.5%
SA017	1.7%	1.8%	0.2%	4.5%	15.8%	3.8%	44.0%	55.8%
SA018	3.0%	1.6%	0.0%	0.0%	20.0%	0.0%	41.1%	48.0%
SA019	4.2%	2.7%	3.1%	9.8%	23.1%	0.0%	61.4%	74.9%
Average	2.8%	2.9%	0.9%	6.6%	22.3%	1.3%	48.1%	57.3%
Top 25%	2.2%	2.2%	0.0%	13.3%	25.1%	1.8%	55.3%	64.3%

Table A7. Overhead costs

Farm number	Rates	Registration & insurance	Farm insurance	Repairs & maintenance	Bank charges	Other overheads	Employed Labour	Total cash overheads	Depreciation	Imputed owner / operator & 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
SA001	0.6%	0.1%	1.1%	1.6%	0.0%	2.3%	1.8%	7.5%	3.6%	34.6%	45.7%
SA002	1.1%	0.1%	1.4%	6.4%	0.0%	2.3%	7.4%	18.7%	3.2%	18.5%	40.4%
SA003	0.6%	0.0%	0.9%	4.0%	1.0%	1.2%	7.0%	14.7%	2.7%	12.0%	29.4%
SA004	0.5%	0.3%	0.7%	4.6%	1.5%	2.2%	13.1%	22.7%	3.3%	14.7%	40.7%
SA005	0.6%	0.1%	1.5%	7.3%	0.2%	2.0%	10.8%	22.5%	11.7%	9.0%	43.3%
SA006	0.5%	1.0%	0.0%	3.7%	0.2%	2.2%	11.6%	19.2%	2.3%	8.6%	30.1%
SA007	0.9%	0.0%	2.7%	12.7%	0.1%	3.0%	6.9%	26.2%	4.3%	15.8%	46.3%
SA008	1.7%	0.1%	1.1%	7.5%	0.1%	2.1%	5.8%	18.4%	11.2%	17.7%	47.2%
SA009	0.7%	0.7%	1.6%	4.7%	1.0%	3.5%	15.1%	27.3%	5.7%	36.1%	69.2%
SA010	1.3%	0.0%	1.6%	8.6%	0.2%	2.3%	9.5%	23.6%	3.7%	15.1%	42.5%
SA011	0.9%	0.5%	1.3%	8.8%	0.1%	4.6%	27.3%	43.4%	2.8%	4.1%	50.3%
SA012	0.4%	0.4%	0.6%	5.0%	0.0%	9.0%	14.9%	30.3%	3.5%	0.0%	33.8%
SA013	0.9%	0.4%	0.6%	6.7%	0.7%	2.0%	6.3%	17.6%	14.3%	25.0%	56.9%
SA014	1.8%	0.0%	1.1%	4.3%	0.0%	3.9%	15.5%	26.7%	1.5%	5.5%	33.7%
SA015	1.0%	0.3%	2.8%	4.0%	2.7%	2.1%	0.3%	13.3%	1.6%	20.8%	35.7%
SA016	5.9%	0.9%	1.7%	5.6%	0.4%	0.8%	8.9%	24.1%	15.5%	4.9%	44.5%
SA017	0.6%	0.1%	1.1%	2.2%	0.1%	3.2%	27.5%	34.9%	9.4%	0.0%	44.2%
SA018	7.8%	0.0%	0.5%	5.6%	0.1%	1.0%	33.3%	48.3%	1.9%	1.8%	52.0%
SA019	0.5%	0.2%	0.7%	4.5%	0.1%	5.5%	10.3%	21.8%	3.3%	0.0%	25.1%
Average	1.5%	0.3%	1.2%	5.7%	0.4%	2.9%	12.3%	24.3%	5.6%	12.8%	42.7%
Top 25%	0.5%	0.3%	0.6%	3.9%	0.6%	3.6%	14.8%	24.4%	4.3%	7.0%	35.7%

Table A8. Capital structure

	Farm Assets				Other farm assets (per usable hectare)				
	Land value	Land value	Permanent water value	Permanent water value	Plant and equipment	Livestock	Hay and grain	Other assets	Total assets
	$/ha	$/cow	$/ha	$/cow	$/ha	$/ha	$/ha	$/ha	$/ha
Average	$10,819	$7,722	$576	$492	$2,001	$2,003	$151	$323	$16,273
Top 25%	$11,728	$6,676	$689	$201	$2,384	$2,400	$111	$241	$17,814

	Liabilities		Equity	
	Liabilities per usable hectare	Liabilities per milking cow	Equity per usable hectare	Average equity
	$/ha	$/cow	$/ha	%
Average	$4,925	$3,439	$11,348	69%
Top 25%	$7,530	$3,996	$10,284	59%

Glossary of terms

All other income

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

Annual hours

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

Appreciation

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

Asset

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

Break-even price required

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

Cash overheads

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

Cost of production

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

Cost structure

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

Debt servicing ratio

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

Depreciation

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

Earnings before interest & 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, workcover etc.

Equity

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

Equity %

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

Farm income

See gross farm income.

Feed costs

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

Finance costs

Total interest plus total lease costs paid.

Full time equivalent (FTE)

Standardised people unit. Equal to 24,00 hours a year. Calculated as 50 hours a week, 48 weeks a year.

Grazed area

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

Grazed pasture

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

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

Total energy available is the sum of energy available from all feed sources except pasture, calculated as (weight (kg) 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 income minus total variable costs.

Herd costs

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

Imputed

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

Imputed labour cost

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

Liability

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

Metabolisable energy

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

Milk income

Income through the sales of milk.

Milking area

Total usable area minus outblocks or run-off areas.

Net farm income

Previously reported as business profit

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

Number of milkers

Total number of cows milked for at least three months.

Other income

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

Overhead costs

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

Labour cost

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

Labour efficiency

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

Labour resource

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

Livestock trading profit

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

Return on assets (RoA)

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

Return on equity (RoE)

Net farm income divided by the value of total equity.

Shed costs

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

Total income

See gross farm income.

Total usable area

Total hectares managed minus that area of land which is of little or no value for livestock production 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.
BPR	Break-even price required.
CH_4	Methane gas.
CO_2	Carbon dioxide gas.
CO_2-e	Carbon dioxide equivalent.
CoP	Cost of production.
DFMP	Dairy Farm Monitor Project.
DM	Dry matter of feed stuffs.
DPI	Department of Primary Industries Victoria.
EBIT	Earnings before interest and tax.
FTE	Full time equivalent.
GWP	Global Warming Potential.
ha	Hectares.
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).
N_2O	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.





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