Dairy Australia

Dairy Farm Monitor Project

South Australia | Annual Report 2017–18

Acknowledgements

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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 2017–18 year. Data is presented for individual farms and as state averages. 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 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 are 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.

Any reference to 'last year' refers to the 2016–17 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 2016–17 are in the 2017–18 report. This year, there are several new participating farms bringing the total number of participants to nineteen. 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 2017–18?

The Dairy Farm Monitor Report for 2017–18 includes a number of changes since last year's report.

Data in this report is produced using standard values, which have been outlined in Appendix B. The standard values for livestock and imputed labour have been revised to align with market values. These standard values may vary from other organisation's standard values. Care should be taken when directly comparing the results of multiple benchmarking studies.

- Within the overhead cost category, registration and insurance have now been separated into farm insurance and motor vehicle expenses. Farm insurance relates to all farm insurance that is not personal, such as death and total and permanent disability (TPD). Motor vehicle expenses include registration, insurance, fuel and repairs on vehicles.
- Return on assets is now referred to as return on total assets.
- Water use previously reported as mm/ha is now reported as total water use efficiency (t DM/100mm/ha). Total water use efficiency estimates the amount of home grown feed produced from rainfall and irrigation applied across the usable area. This calculation aligns with DairyBase and the Dairy Moving Forward Feedbase targets.
- Australia's dairy industry greenhouse gas emissions calculator, the national greenhouse gas inventory (NGGI), was used in conjunction with the physical and financial data provided by participant farms. The NGGI emissions calculator is now embedded within DairyBase resulting in some small differences with data entry, and care should be taken when comparing between calculators.

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

Summary

In 2017–18, the data from 19 participant farms in South Australia demonstrated an increased level of earnings before interest and tax (EBIT) from whole of farm operations to $294,920. Return on total assets increased to 4.3% (2016–17: 3.1%) with a net farm income of $174,240. Return on equity also increased to 4.1% compared to last year's 2.1%.

This is the sixth 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 2017–18 year presented near average annual rainfall in most areas, with above average spring rainfall and a dry start to 2018. Dairy farmers noticeably reduced the amount of conserved fodder in comparison with last year's exceptional year averaging 1.3 t DM/ha in 2017–18 down from 1.9 t DM/ha in 2016–17.

Participating farms had an average herd size of 399 cows and usable area of 527 ha. Average milk sold was 569 kg MS/cow with home grown feed providing 54% of metabolisable energy (ME), down from 64% in 2016–17. Labour use efficiency of participating farms in South Australia continues to improve with a 10% increase in kilograms of milk solids per FTE on last year's data.

South Australian participant farms exhibited a wide range of feeding systems. Directly grazed pasture was the dominant source of metabolisable energy supplying on average 34% of ME to livestock, down from last year's 37%. In 2017–18, farmers applied an average of 149 kg/ha of nutrients, 59% being nitrogen.

A higher average price received per kilogram of milk solids in 2017–18 combined with a lower cost of production resulted in better returns for South Australian participants. Average price received increased 8% from $5.78/kg MS to $6.24/kg MS and cost of production was down from $6.03/kg MS to $5.90/kg MS.

Average variable costs have been maintained from last year with the 2017–18 average being $3.40/kg MS. Average overhead costs (cash and non-cash) for this year decreased to $2.50/kg MS for the survey down from $2.71/kg MS in 2016–17. Subsequently the average cost of production (including inventory change) was $5.90/kg MS down from $6.03/kg MS last year.

EBIT for participating farms averaged higher than last year averaging $1.18/kg MS compared to $0.88/kg MS in 2016–17, a 34% increase. The rise in EBIT is largely explained by maintaining low cost of production matched with a 7.95% increase in milk price.

Interest and Lease costs rose 21% this year to $120,679.

In 2017–18 average EBIT was $294,920 with net farm income of $174,240. This was the second best performance recorded since the high milk price year of 2013–14.

Average return on total assets for 2017–18 were 4.3%, an improvement on the previous year of 3.1% and also above the six year average of 3.3%.

Return on equity rose to 4.1% up from last year's average of 2.1%. This is due to a combination of improved conditions.

Expectations for the 2018–19 year are generally positive with 41% of respondents expecting an improvement to their returns. Just under one third (29%) of respondents however do expect a deterioration in business returns. The mixed response is due to the some participants considering new opportunities for milk sales, and others concerned about seasonal conditions and elevating costs of fodder and electricity prices.

Greenhouse gasses emitted by participant farms where 14.14 t CO_2-e/t MS in 2017–18 down from last year's 14.2t CO_2-e/t MS.

Farm monitor method

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

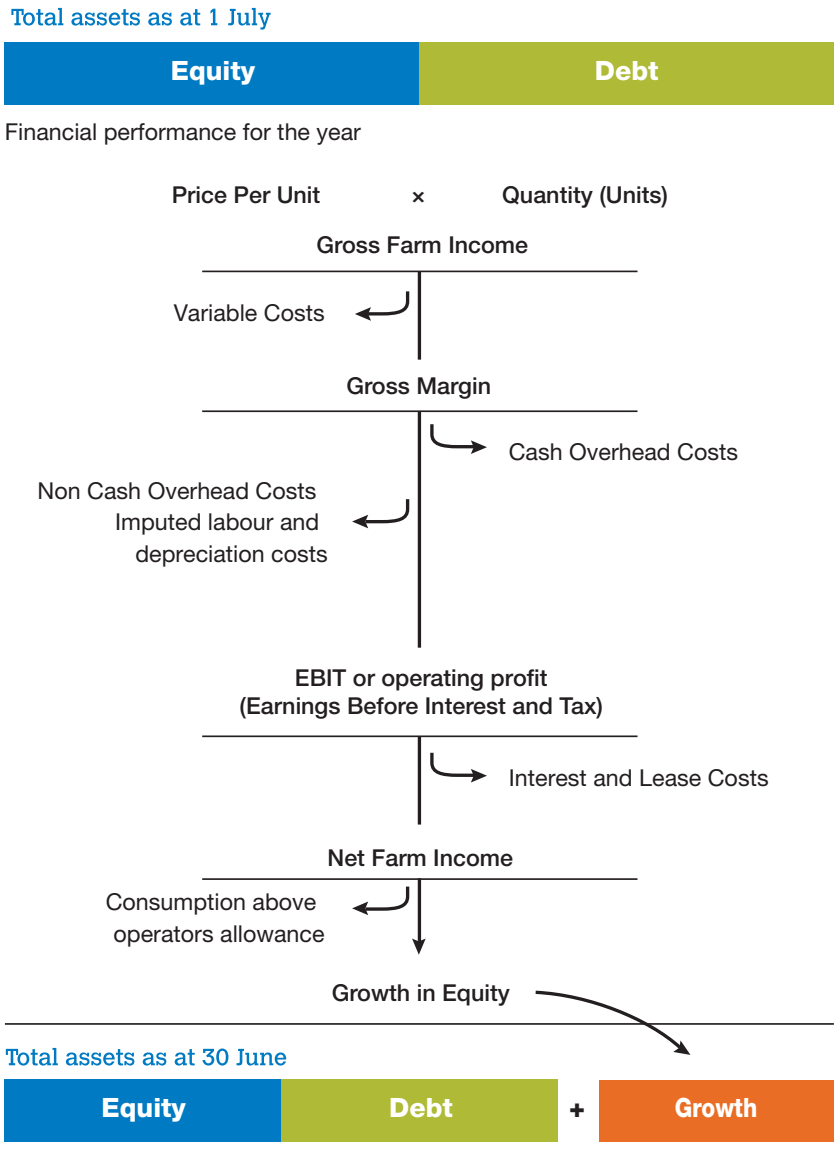
The method employed to generate the profitability and productivity data was adapted from that described in The Farming Game (Malcolm et al. 2005) and is consistent with previous Dairy Farm Monitor Project (DFMP) reports. Readers should be aware that not all benchmarking programs use the same method or 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, 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 total assets and return on equity

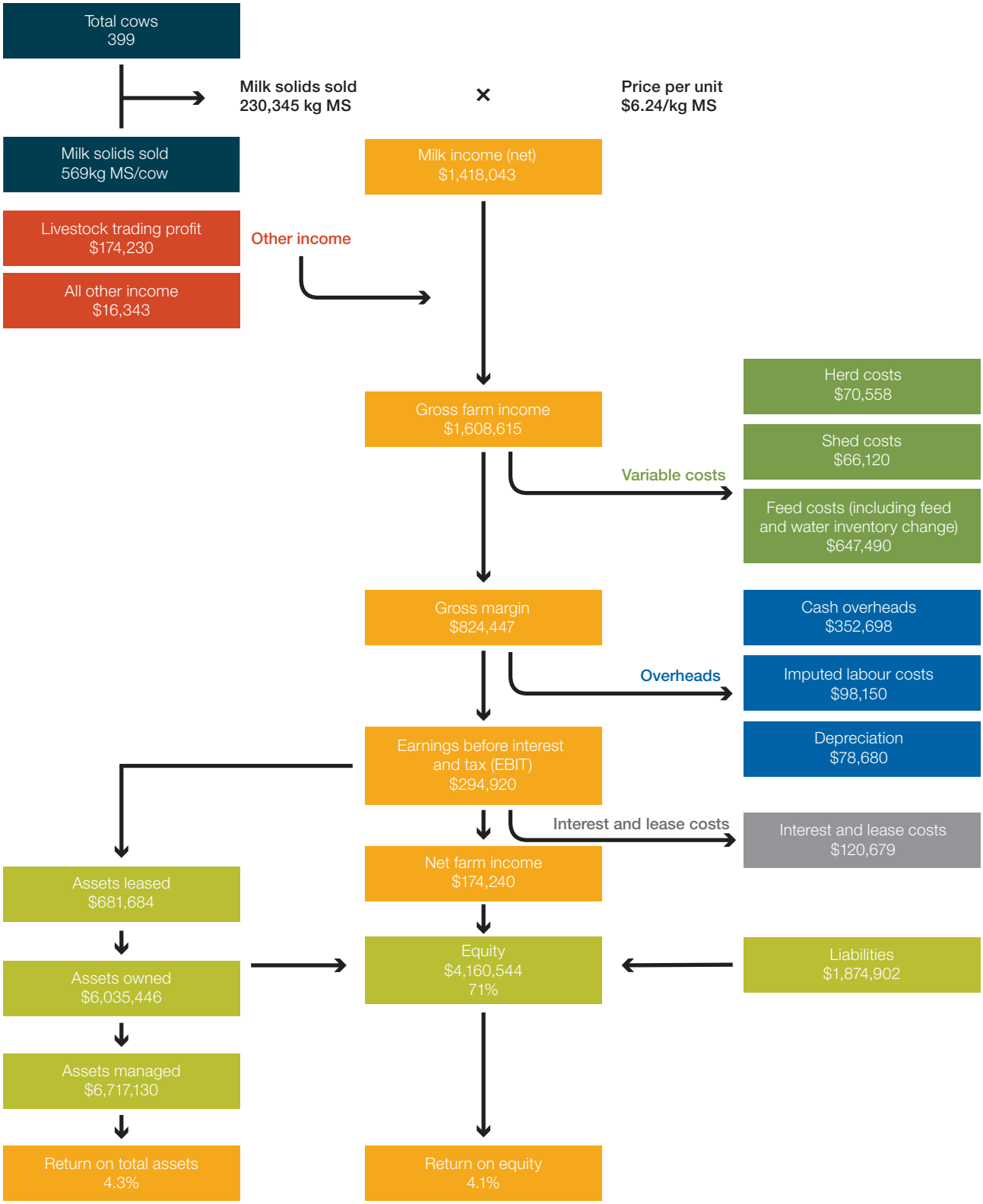
Two commonly used economic indicators of whole farm performance are return on total assets (RoTA) and return on equity (RoE). They measure the return to their respective capital base.

Return on total 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 total 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 without capital appreciation. The RoE is reported in Appendix Table A1.

Figure 2 Dairy Farm Monitor Project method profit map* – state average 2017–18 data



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

South Australia overview

South Australian dairy industry

South Australia represents approximately 5.4%, or 505.0 million litres, of the national milk output in the Australian dairy industry, up from 487.5 million litres in 2016–17.

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 in this region contributes 3% of South Australia's production with 8% of the State's dairy farms located in this region.

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 this region is contracting but it still accounts for 51% of State's dairy farms. 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.

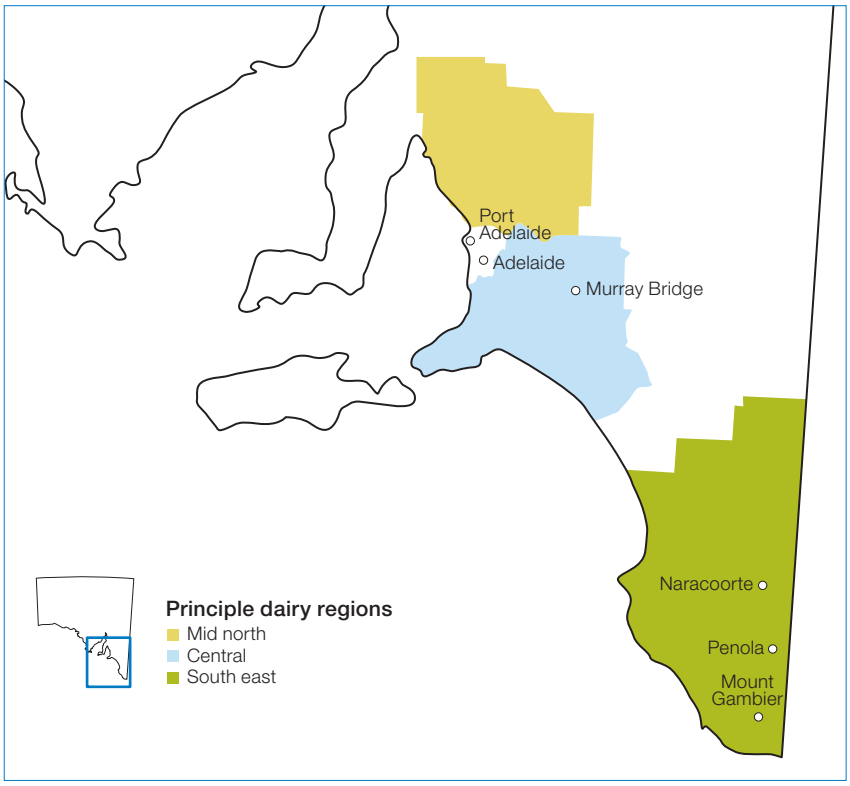
The River and Lakes have a history of being affected by severe water restrictions particularly during the 2000s and drought times. These farms are more dependent on irrigation and natural water flows for fodder production and livestock and domestic purposes than the Mid North, Fleurieu Peninsula and 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 has 41% of South Australia's dairy farms located in it and produces approximately 59% of South Australia's milk production.

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 and 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.

Figure 3 South Australian dairying regions



Seasonal conditions

The 2017–18 year presented near average annual rainfall in most areas, with above average spring rainfall and a dry start to 2018. Dairy farmers noticeably reduced the amount of conserved fodder in comparison with last year's exceptional year averaging 1.3 t DM/ha in 2017–18 down from 1.9 t DM/ha in 2016–17. Drier conditions in 2018 saw the demand for purchased fodder increase nationwide putting upward pressure on prices.

Seasonal conditions were near average across the dairy regions of South Australia during 2017–18 with most participant farms recording near average rainfall for the financial year (Figure 4). Total rainfall for South Australian participants was on average 686mm or 7mm above long term average.

The financial year started with above long term average rainfall in July and August 2017. Average rainfall continued through spring as temperatures warmed up.

Seasonal conditions across South Australia and large parts of the eastern sates deteriorated as a whole in 2018 with the lower South East and part of the Fleurieu Peninsula being exceptions.

From January through to June 2018, rainfall only exceeded the monthly average in May and only by 4mm as a state average.

Although participants conserved less feed during this financial year many reported that quality of both conserved feed and purchased feed was better than previous.

The lower conserved fodder available at June 2018 and the late start to the 2018 winter growing season will result in ongoing pressure on feed prices into the 2018–19 financial year.

Figure 4 Monthly average rainfall (all farms)

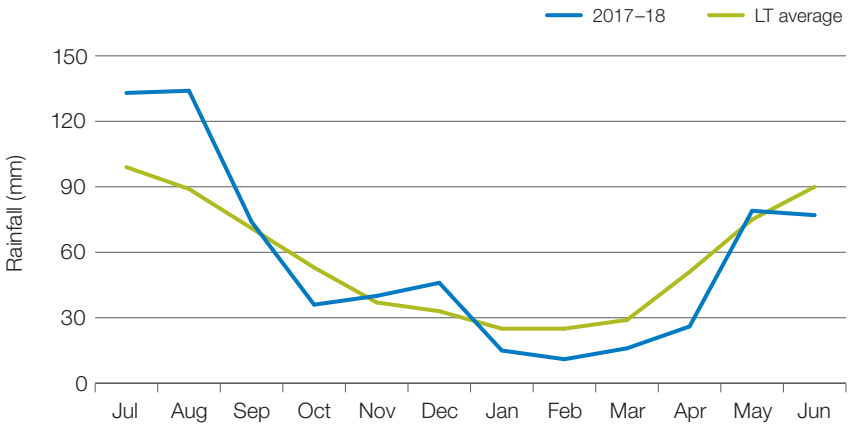
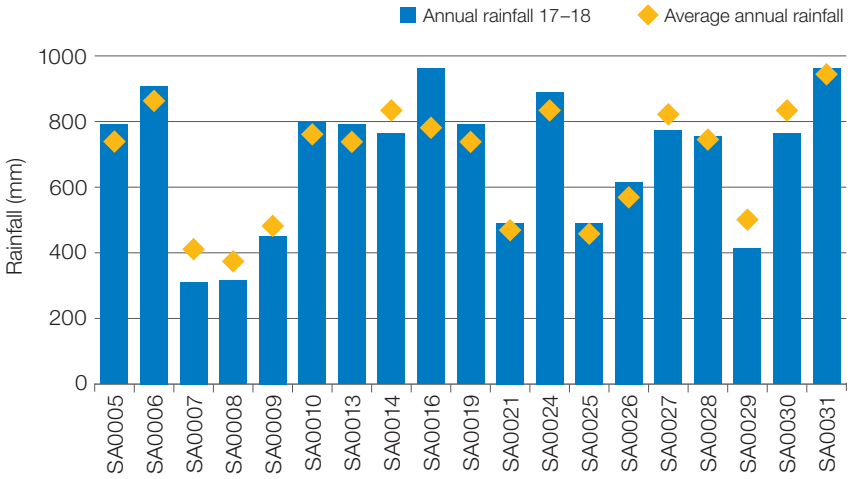


Figure 5 2017–18 annual rainfall and long term average rainfall of participant farms



Whole farm analysis

A higher average price received per kilogram of milk solids and lower cost of production resulted in better returns for South Australian participants in 2017–18. Average price received increased 8% from $5.78/kg MS to $6.24/kg MS and cost of production was down 4% from $6.03/kg MS to $5.90/kg MS. Results were influenced by the amount of home grown feed produced and the varying production systems used.

Participating farms had an average herd size of 399 cows and usable area of 527 ha. Average milk sold was 569 kg MS/cow with home grown feed providing 54% of metabolisable energy (ME), down from 64% in 2016–17. Labour use efficiency of participating farms in South Australia continues to improve with a 10% increase in kilograms of milk solids per FTE on last year's data.

The average herd size of South Australian participant farmers was 399 cows/farm in 2017–18, a slight increase of 1.2% compared to 394 cows/farm last year. Participants carried an average stocking rate of 1.1 cows/usable hectare with Q1-Q3 ranging from 0.6 to 1.4 cows/usable hectare (Table 1).

Participant farms sold an average of 569 kg MS/cow in 2017–18, up 5.6% on the previous year's average of 539kg MS/cow. This is reflective of a general increase in MS sold across participating farms, but is largely due to new farms participating in 2017–18 for the first time.

The average annual rainfall received by participants was 686 mm which is 7mm above average rainfall although a 12% decrease on 2016–17. Water use efficiency for Q1-Q3 ranged from 0.4 to 0.7 t DM/100mm/ha with the state averaging 0.6 t DM/100mm/ha. Participants with irrigation increased the average in water use efficiency capitalising on pasture production in the drier months in summer and autumn.

Home-grown feed as a proportion of ME consumed had a wide spread in the Q1 to Q3 range of 43% – 67%. The 24% difference in home-grown feed production is due to the variation of production systems in South Australia. State wide home-grown feed as a proportion of ME consumed was 54% down on 2016–17 which was 64%.

Efficiency in labour use continues to improve in South Australia with the state average in 2017–18 being 94 cows/FTE up from 90 in 2016–17. The Q1 to Q3 range was 70 to 108 milking cows/FTE which represents the variation in the scale of farms and livestock management systems.

The average labour efficiency was 52,742 kg MS/FTE an increase of 10% from 47,861 kg MS/FTE the previous year. The Q1 to Q3 range was 39,144kg MS/FTE to 61,384 kg MS/FTE indicating approximately 30% difference between the quartiles on a kg MS/FTE basis.

Gross farm income

Gross farm income is inclusive of all milk sales, change in inventories of livestock, cash income from livestock trading profit and milk factory share dividends (included as other income). As occurred in 2016–17, feed inventory changes are included in feed costs.

Gross farm income for participants in 2017–18 combined an average of 88% milk income and 12% from all other income.

Figure 6 displays the gross farm income for participant farms throughout the South Australian dairying areas. The Q1 to Q3 range of gross farm income received was between $6.54/kg MS and $7.26/kg MS with an average of $7.08/kg MS.

Table 1 Farm physical data

Farm physical parameters	State average	Q1 to Q3 range
Annual rainfall 17–18 (mm)	686	491–796
Total water use efficiency (t DM/100mm/ha)	0.6	0.4–0.7
Total usable area (ha)	527	226–577
Milking cows per usable hectares	1.1	0.6–1.4
Milk sold (kg MS/cow)	569	524–604
Milk sold (kg MS/ha)	628	370–737
Home grown feed as percentage of ME consumed	54	43–67
Labour efficiency (cows/FTE)	94	70–108
Labour efficiency (kg MS/FTE)	52,742	39,144–61,384

The average milk income received was $6.24/kg MS in 2017–18, an increase of 7.95% on last year's average $5.78/kg MS. South Australian participant farmers welcomed the increase in milk price received after recent lows. Participants sold to a wide variety of processors, with some making changes in who they supply in order to improve income and stability within their businesses.

Participant farmers also received an average of $0.84 kg/MS from all other income which was made up of $0.75 kg/MS from livestock trading profit and $0.09 kg/MS from other farm income. The Q1 to Q3 range for 'all other income' noticeably reduced in 2017–18 being $0.53 kg/MS to $0.93 kg/MS down from $0.52/kg MS to $2.41/kg MS in 2016–17. This result is largely due to reduced livestock sales in 2017–18. Participants in 2016–17 capitalised on high beef prices and increased livestock sales in order to supplement the low milk price on offer at the time.

Milk solids sold

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

The quantity of milk solids sold in the Q1 to Q3 range is from 370 kg MS/ha to 737 kg MS/ha with an average of 628 kg MS/ha which is consistent with the 2016–17 average of 630 kg MS/ha.

In 2017–18, the average farm consisted of 527 usable hectares containing 1.1 milking cows per usable hectare.

Figure 6 Gross farm income of per kilogram of milk solids

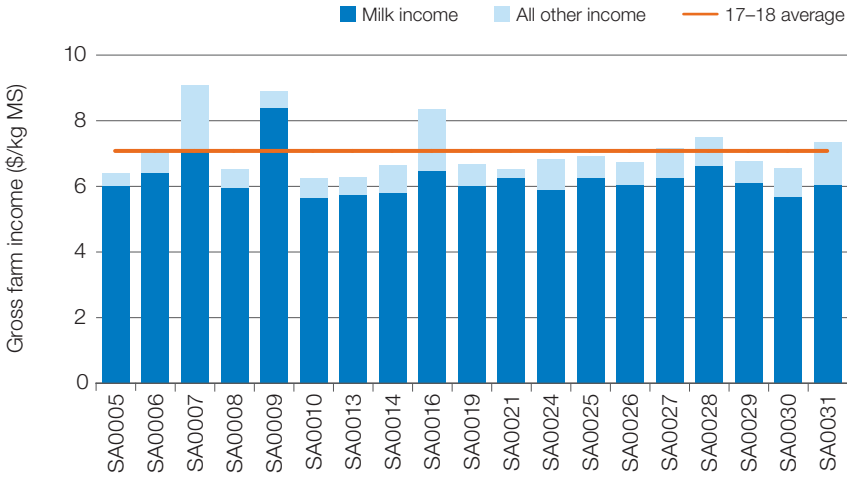
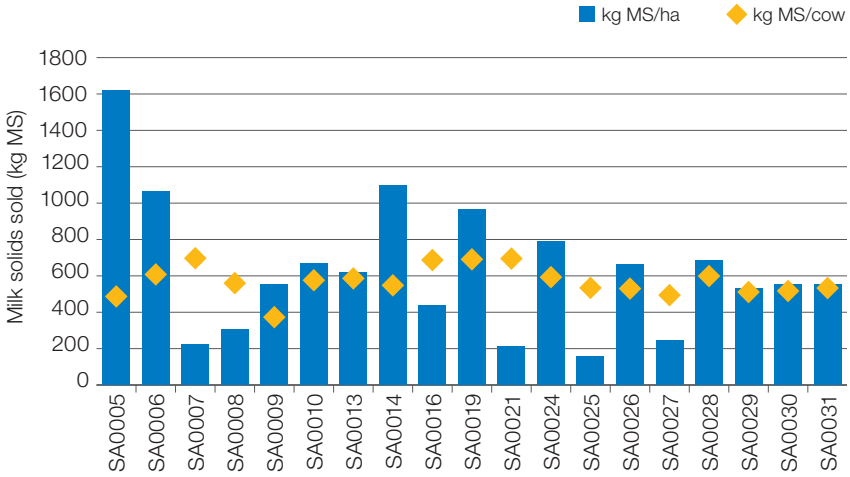


Figure 7 Milk solids sold



While the variance is quite large in terms of milk solids per hectare, milk solids sold per cow is relatively even between participants, averaging 569 kg MS/cow and varies between Q1 to Q3 524–604 kg MS/cow.

A focus on grazing systems and irrigation allowed some participating farms to grow and utilise more pasture resulting in increased feed utilisation on a per hectare basis along with higher stocking rates.

Such a wide variation in milk solids sold per hectare is due to differences in rainfall, irrigation use, growing season length, soil types reflecting the diverse production systems in dairying regions of South Australia.

Milk sales versus calving pattern

Figure 8 below shows average milk sales for all participant farms against the monthly distribution of cows calving. 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 participants in July which reflects targeted 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.

Variable costs

Figure 9 shows a breakdown of whole farm costs distinguishing between variable and overhead costs per kilogram of milk solids. Variable costs are those that vary proportionally to the amount of output and include herd, shed, feed costs as well as feed inventory change.

Historically, average variable costs in South Australia have been relatively stable since 2013–14 ($3.85/kg MS), 2014–15 ($3.98/kg MS) and 2015–16 ($3.86/kg MS). During the low price year of 2016–17 participants lowered the average variable costs to $3.23/kg MS. This reduction in average variable costs has been maintained with the 2017–18 average being $3.40/kg MS.

There are distinct differences between the level of variable costs between participants shown below (Figure 9). While herd and shed costs were relatively stable, levels of home-grown and purchased feed were often the difference.

In 2017–18, average herd and shed costs were $0.31/kg MS and $0.29/kg MS respectively. Herd and shed costs represented 18% of variable costs.

Feed costs contribute significantly to the costs of participant farms being 82% of variable costs. Home grown feed as a percentage of ME consumed for 2017–18 averaged 54% at an average price of $0.91/kg MS. This is a reduction in price from $1.22/kg MS in 2016–17 as feed stocks on hand were utilised due to dry conditions in 2018.

Purchased feed and agistment averaged $1.80/kg MS. Purchased feed was higher than 2016–17 $1.41/kg MS yet lower than 2015–16 $2.08/kg MS. The range between Q1 to Q3 was $1.38/kg MS to $2.23/kg MS.

Prices for purchased fodder were influenced by seasonal conditions, commencing the financial year at a low level and increasing in 2018 as competition increased nationally for livestock fodder.

The breakdown of variable costs can be found in Appendix Table A4 and Table A6.

Figure 8 Milk sales vs calving pattern

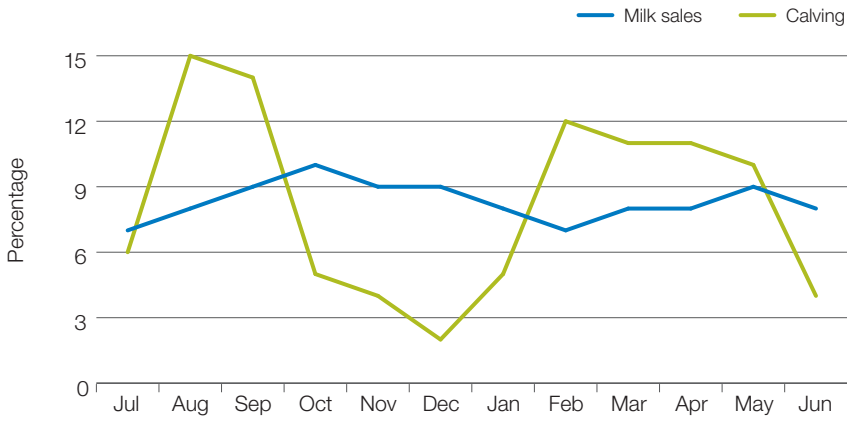
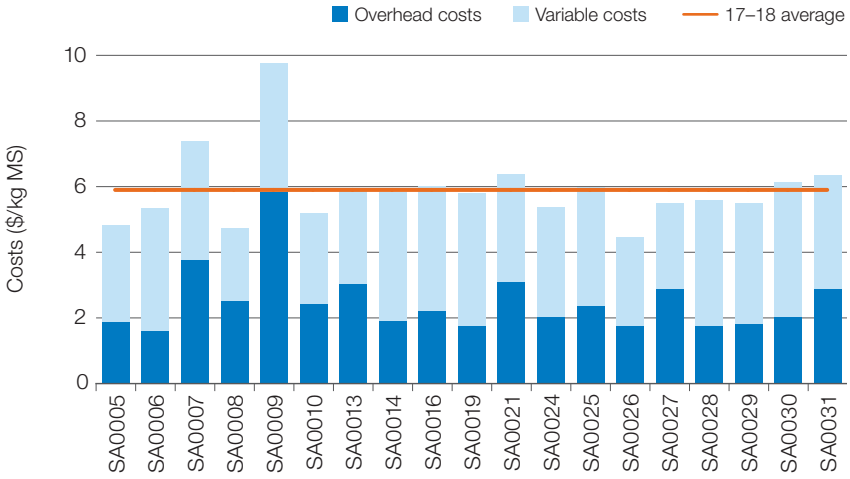


Figure 9 Whole farm variable and overhead costs per kilogram of milk solids



Overhead costs

Overhead costs are those that do not vary significantly with the level of production.

The Dairy Farm Monitor Project includes cash overheads such as repairs and maintenance, paid labour, rates and insurance as well as non-cash costs such as imputed labour and depreciation of plant and equipment. Imputed labour cost is an estimate of the cost of the time spent in the business by people with a share in the business such as the owner, the owner's family or a share farmer who owns assets of the business. Further information on imputed labour can be found in Appendix B.

Average overhead costs (cash and non-cash) for this year decreased to $2.50/kg MS for the survey down from $2.71/kg MS in 2016–17. Repairs and maintenance averaged $0.29/kg MS this year while all other overheads averaged $0.40/kg MS.

Significantly, the average cost of employed labour rose by 15% this year to $0.92/kg MS as imputed labour reduced 25%, down from $0.72/kg MS 2016–17 to $0.54/kg MS in 2017–18.

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 from the total of variable and overhead costs and accounts for changes in fodder and livestock inventory. Including changes in fodder inventory is important to establish the complete cost to the business. The changes in fodder inventory account for the net cost of feed from what was fed out, conserved, purchased and stored over the year. Livestock trading loss or increase is also considered in the cost of production where there is a decrease in the value of livestock due to reduced stock numbers, or an increase due to natural increase rather than through purchases.

Table 2 shows that the total variable and overhead costs (including feed inventory change) was $5.90/kg MS down from $6.03/kg MS last year.

Dairy participants decreased their feed inventories with an average expense of $0.09/kg MS in 2017–18, while increased livestock inventories resulted in an average write back of $0.13/kg MS.

Having a low cost of production (variable and cash and non cash overheads) was maintained from 2016–17 into 2017–18 which gave greater opportunity to increase profit margins with higher prices on offer during the year.

Table 2 Total variable and overhead costs

Farm income and cost category	State average	Q1 to Q3 range
Income		
Milk income (net)	6.24	5.92–6.33
Livestock trading profit	0.75	0.53–0.89
Other farm income	0.09	0–0.04
Total income	**7.08**	**6.54–7.26**
Variable costs		
Herd cost	0.31	0.2–0.4
Shed cost	0.29	0.22–0.35
Home grown feed cost	0.91	0.7–1.04
Purchased feed and agistment	1.80	1.38–2.23
Feed inventory change	0.09	-0.01–0.21
Total feed costs	**2.80**	**2.37–3.21**
Total variable costs	**3.40**	**2.9–3.81**
Gross margin	**3.68**	**3.27–4.16**
Overhead costs		
Employed labour	0.92	0.69–1.05
Repairs and maintenance	0.29	0.18–0.31
All other overheads	0.40	0.22–0.46
Imputed labour	0.54	0.28–0.83
Depreciation	0.35	0.19–0.5
Total overhead costs	**2.50**	**1.84–2.88**
Variable and overhead costs	**5.90**	**5.36–6.07**
Earnings before interest and tax	**1.18**	**0.84–1.71**

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 provides a comparable measure of participant's operating performance.

In 2017–18 the EBIT for participating farms averaged significantly higher than last year averaging $1.18/kg MS compared to $0.88/kg MS in 2016–17, a 34% increase.

The rise in EBIT is largely explained by maintaining low cost of production matched with a 7.95% increase in milk price.

Only one participant recorded a negative EBIT in 2017–18 which contained higher than average overhead expenses due to imputed labour.

Return on total assets and equity

Return on total assets (RoTA) is the EBIT expressed as a percentage of total assets under management. It is therefore an indicator of the overall earning power of total assets, irrespective of capital structure. Figures 11 to 14 were calculated excluding capital appreciation.

In 2017–18 the RoTA achieved by participant farms was between negative 2% and 11%. Other than two outliers at either end of the spectrum, RoTA for 2017–18 included 11 participants in the 0%-5% range and 6 participants achieving RoTA of between 5 and 10 percent (Figure 11).

The average RoTA for participants across South Australia for 2017–18 was 4.3% (ranging from negative 1.3% to 10.1% – see Figure 12). This is a positive result following an average RoTA in 2016–17 of 3.1%.

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

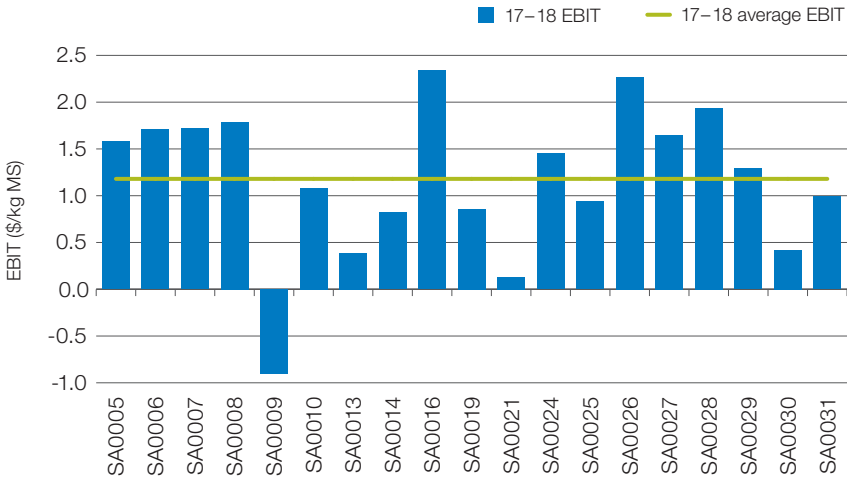


Figure 11 Distribution of farms by return on total assets

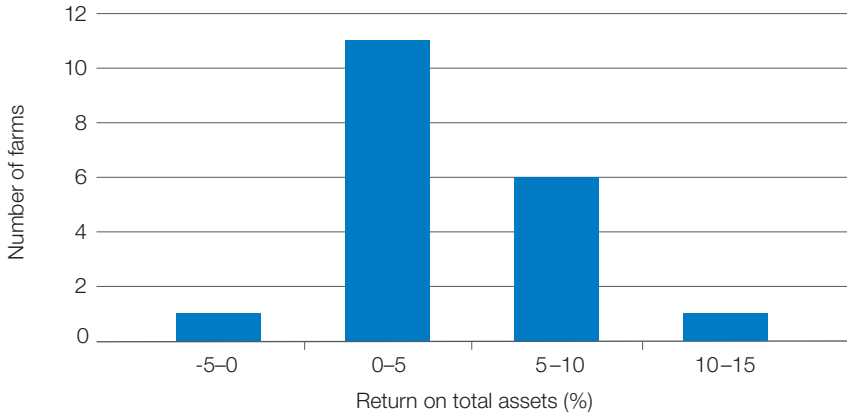
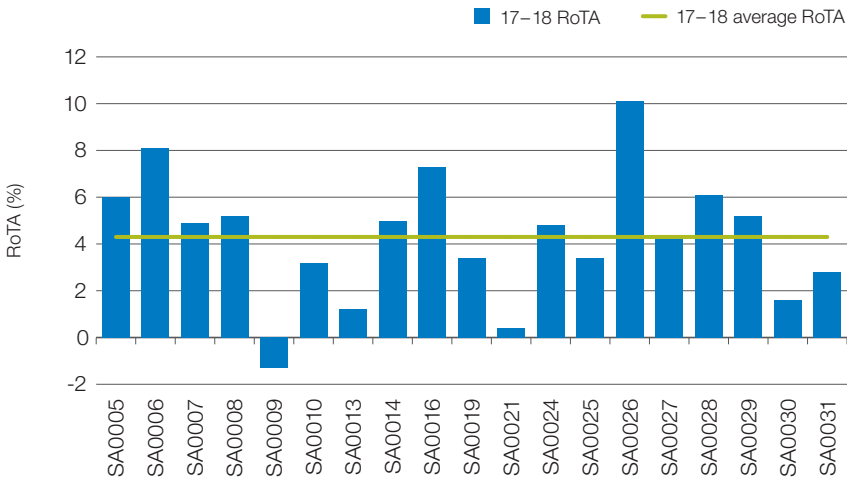


Figure 12 Return on total assets



The return on equity (RoE) 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 after allowing for interest and lease costs.

In 2017–18, no farms achieved a RoE less than negative 5% or greater than 10%, four farms recorded between negative 5% and 0%, eight farms achieved between 0% and 5%, four farms had RoE of between 5% and 10% and three farms between 10% and 15%(Figure 13).

The average RoE this year was 4.1% (ranging from negative 4.2% to positive 12.7%), compared to 2.1% in 2016–17. The average increase in RoE is partially influenced by the inclusion of 4 new farms in comparison with last year, but also reflects a higher average gross margin.

For more information, Appendix Table A1 presents the RoTA and RoE for all participant farms.

Figure 13 Distribution of farms by return on equity

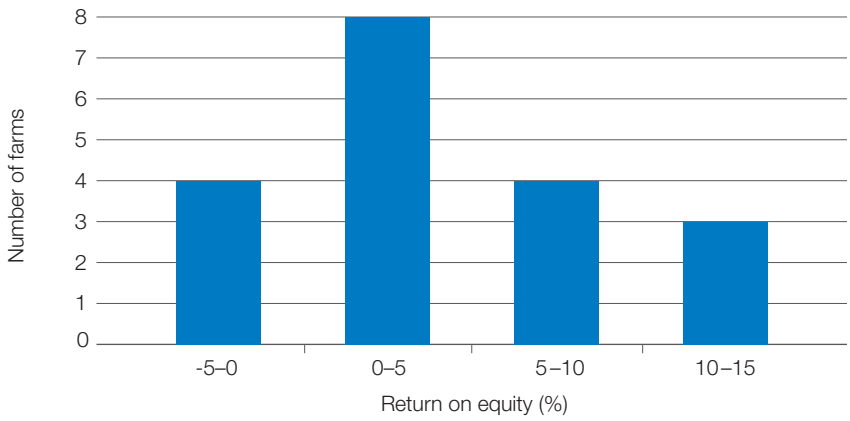
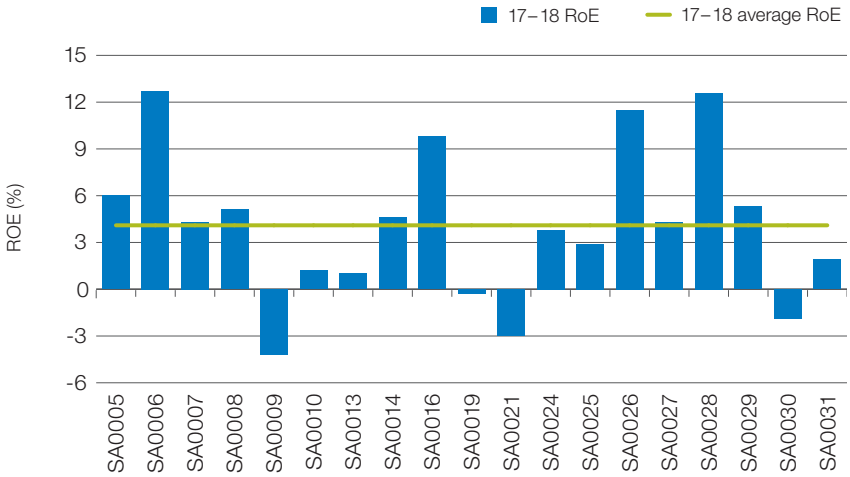


Figure 14 Return on equity



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…"[1]

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.

All farms are exposed to business and financial risk which is 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 indicators, 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, $0.58 was used to cover variable costs in 2017–18. 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 7% this year is the same as reported last year. It indicates that on average farms paid $0.07 from every dollar of gross farm income to their creditors.

Equity levels across the state decreased this year, with an average of 71% being reported compared to 73% in 2016–17 and 65% in 2015–16. 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 RoTA. When the percentage of RoE increases compared to RoTA, it is the result of a higher return from the additional assets than the interest or lease rate. In 2017–18, only five of the 19 (26%) participant farms received a RoE greater than their RoTA. This is a similar number to previous surveys.

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 increased in 2017–18 to an average 46% which reflects the average across the previous six years. The 2016–17 season was an exception at 36% of ME sourced from imported feed as participants were able to rely more on home grown fodder. Previous to 2016–17 the average ranged from 43%-52%.

Table 3 Risk Indicators – statewide

	2013–14	2014–15	2015–16	2016–17	2017–18
Cost structure (proportion of total costs that are variable costs)	57%	61%	59%	57%	58%
Debt servicing ratio (percentage of income as finance costs)	7%	8%	8%	7%	7%
Debt per cow	$3,439	$3,991	$4,803	$4,369	$4,503
Equity percentage (ownership of total assets managed)	69%	69%	65%	73%	71%
Percentage of feed imported (as a % of total ME)	43%	51%	52%	36%	46%

1 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

South Australian participant farms exhibited a wide range of feeding systems. Concentrates (34%) and grazed pasture (34%) were the dominant sources of metabolisable energy. In 2017–18, farmers applied an average of 149 kg/ha of nutrients, 59% being nitrogen.

Feed consumption

The contribution of different feed sources to the total ME consumed on the farm is presented in Figure 15. This includes feed consumed by dry cows and young stock.

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

Pasture grazed was the main source of metabolisable energy (ME) consumed by livestock for 11 of 19 participants, compared with 12 of 15 in 2016–17. This is likely due to seasonal conditions in 2016–17 enabling a greater reliance on grazed pasture than is the norm. Excluding three farms which would be considered TMR farms (total mixed ration), directly grazed pasture represented 39% on average of ME consumed (2016–17: 51%).

Concentrates were the most utilised source of total ME fed to livestock with an average of 34% (34% in 2016–17) of total ME fed. The average price for concentrates increased 12% to $340/t DM in 2017–18 (2016–17: $304/t DM). Hay's contribution to ME increased from 11 to 15% and silage decreased from 14% to 13% Other feed contributed the remaining 4% of metabolisable energy, including the feedlot and cut and carry dairies.

Appendix Table A3 provides further information on purchased feed.

Figure 16 and Appendix Table A2 gives an estimate of the average quantity for home grown feed consumed per milking hectare for participant farms across the state. It accounts only for the consumption of pasture that occurred on the milking area whether by milking, dry or young stock.

Figure 15 Sources of whole farm metabolisable energy

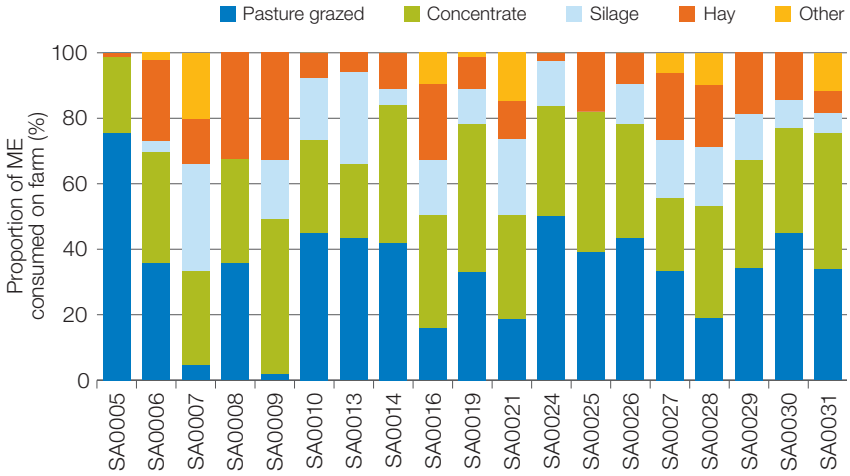
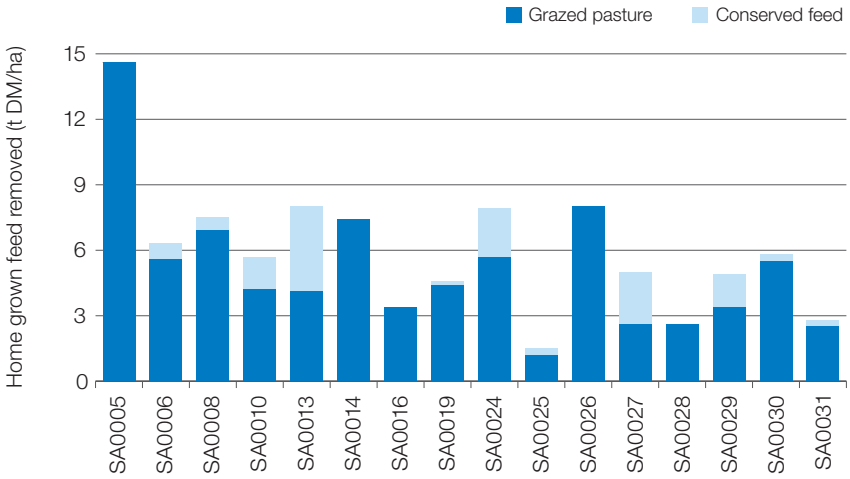


Figure 16 Estimated tonnes of home grown feed consumed per milking area hectare



The range of home grown feed consumed per milking hectare varied greatly among the participant producers as shown in Figure 16. The average estimated pasture consumed as grazed feed on the milking area was 4.4 t/ha (7.2 t DM/ha in 2016–17) with an additional 1.3 t/ha (1.9 t DM/ha in 2016–17) harvested as conserved fodder. The lower pasture consumption and conserved fodder was not so much reflective of the drier start to 2018, but rather the exceptional growing season of 2016–17 being one of the wettest years on record.

Both Figures 15 and 16 were estimated using the pasture consumption calculator in DairyBase which is reasonably similar but not directly comparable to figures published in previous years using the DEDJTR Pasture Consumption Calculator.

This involves a calculation based on the total ME required on the farm, live weight, average distance stock walk to and from the dairy and milk production. Metabolised energy imported from other feed sources is subtracted from the total farm ME requirements over the year to estimate the total produced on farm, divided into grazed and conserved feed depending on the quantity of fodder production recorded.

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

Fertiliser application

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

Despite changes in farm participants this year, fertiliser use remains similar to that of 2016–17 and in line with historical averages.

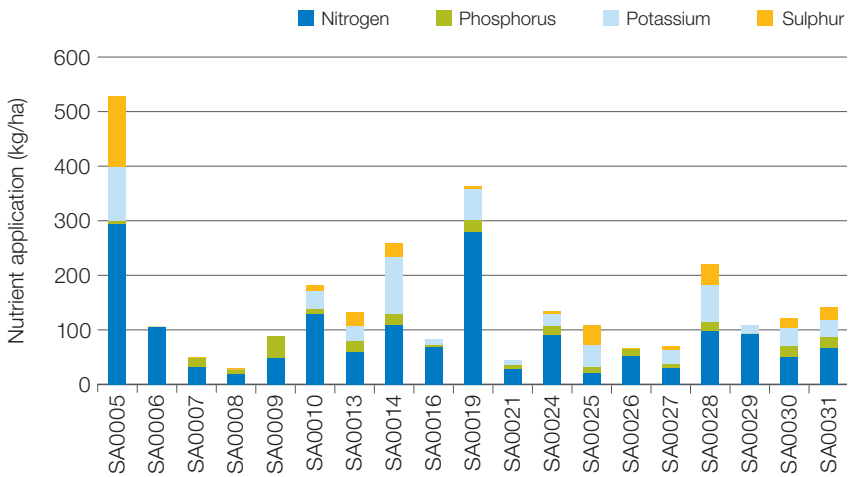
Fertilisers used on dryland pastures were urea and diammonium phosphate (DAP) which are both leading sources of nitrogen. Irrigators who elected to apply fertiliser more frequently used custom fertilisers to optimise feed growth.

Figure 17 shows the range 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 use of nitrogen on farm varies greatly between participants being 21.73 kg/ha and 294 kg/ha while it averages 88 kg/ha. Distribution varies per farm but is used in higher quantities by irrigators.

Phosphorous use ranged from 0 kg/ha to 38.67 kg/ha. Potassium use ranged from 0 kg/ha to 104.44 kg/ha. Sulphur use ranged from 0 kg/ha to 130 kg/ha. Further information on fertiliser application can be found in Appendix Table A2.

Figure 17 Fertiliser application per useable hectare (kg/ha)



Business confidence survey

Expectations and issues

Responses to this business confidence survey were made in July and August 2018 with regard to the 2018–19 financial year and the next five years to 2022–23. It should be noted that at this time there remained some optimism of a reasonable winter growing season in South Australia based on crop emergence and above average rainfall in August.

Expectation for business returns

Expectations for the 2018–19 year are generally positive with 41% of respondents expecting an improvement to their returns. Just under one third (29%) of respondents however do expect a deterioration in business returns. The mixed response is due to the some participants considering new opportunities for milk sales, and others concerned about seasonal conditions and elevating costs including electricity prices.

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

At the time of data collection, farmers had received their 2018–19 milk price announcements which provided some level of optimism.

Price and production expectations – milk

On the basis that 2018–19 opening milk prices had been announced, over 50% of dairy farmers expected their milk price to increase in the next 12 months (Figure 19) while the remainder are expecting milk prices to remain at similar levels to 2016–17.

Similarly, 47% of participants expect milk production to increase while 47% expect they will continue a stable production. 6% said they may decrease production for 2018–19.

Figure 18 Expectation of business returns

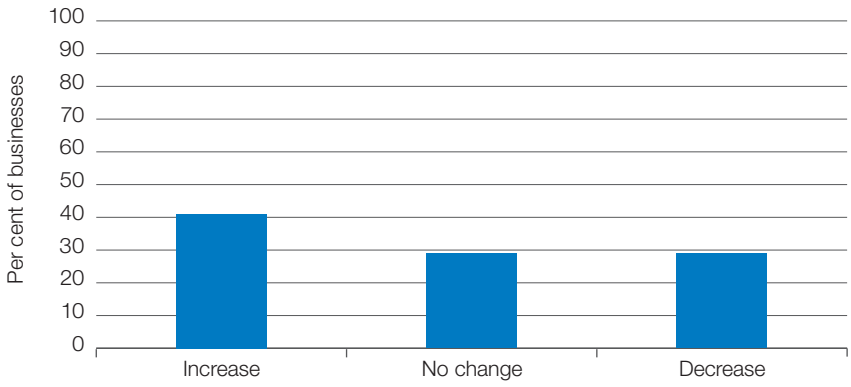
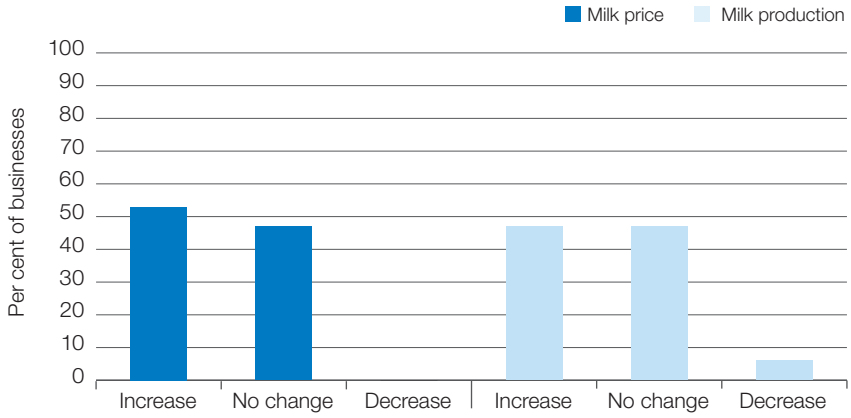


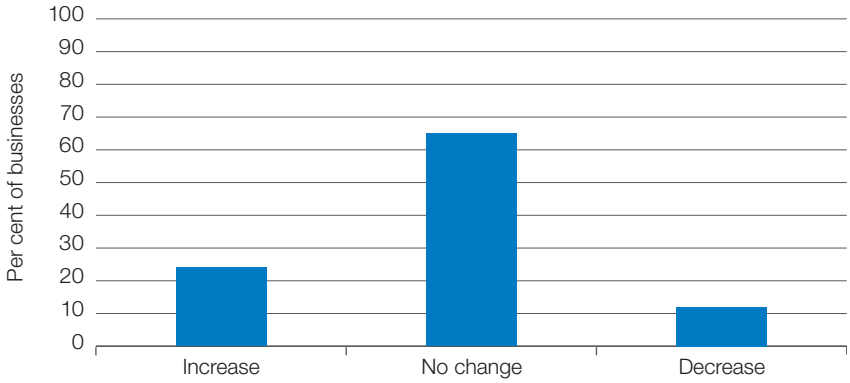
Figure 19 Price and production expectations – milk



Production expectations – fodder

Participants had reported average or above average pasture growth across the state in 2017–18, allowing for high levels of conserved feed. This was particularly true in the lower South East of SA and across the Fleurieu Peninsula. The majority of respondents (65%) expect to maintain fodder production at similar levels in 2018–19, with only 12% expecting a reduction in production (Figure 20).

Figure 20 Producer expectations – fodder



Cost expectations

Data in Figure 21 represent the expectations with regard to costs in 2018–19 from the 19 South Australian participants. Survey responses were provided in late July and early August based on understanding of seasonal conditions known at the time.

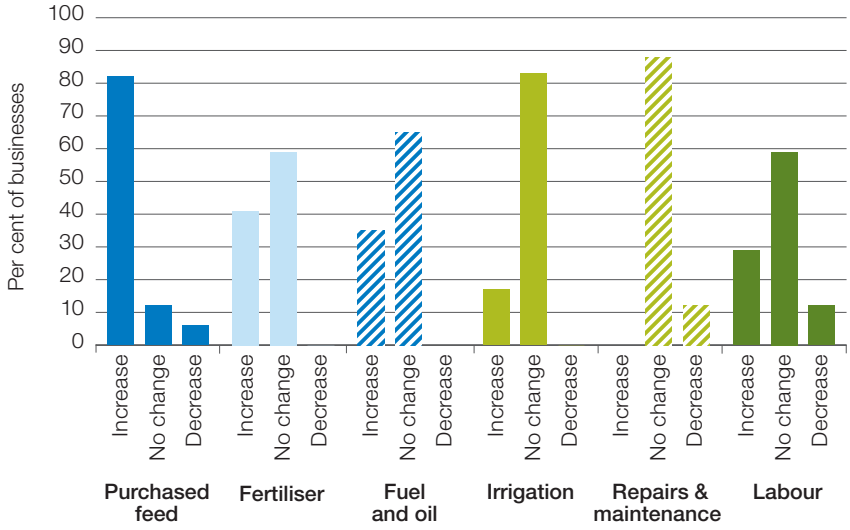
Over 80% expected purchased feed costs to continue to increase as they had for the first half of 2018.

The majority of respondents are expecting prices of fertiliser, fuel and oil to remain stable. However 40% and 35% of respondents respectively have an expectation that fertiliser costs and fuel and oil costs will increase.

Over 80% of participants expected irrigation costs and repairs and maintenance to remain stable.

Respondents were divided in their expectations about labour based on their production programs. The majority of respondents expect no change in labour costs.

Figure 21 Costs expectations



Major issues facing the dairy industry – the next 12 months

Survey participants were asked to rate the significance of seven issues for the dairy industry over the coming 12 months. A summary of the major issues identified by participants is in Figure 22.

The four most significant issues identified by respondents for the next 12 months in order of importance were milk price, input costs, pasture and fodder and climate/seasonal conditions.

Milk pricing remains at front of mind for many participants this year having been disappointed with prices received in 2016–17.

Electricity and input costs remain a cause for concern alongside pasture/fodder availability and the unknown effect of the dry start to the season both within the state and nationally.

Major issues facing the dairy industry – the next five years

Figure 23 shows the key issues identified by participants over the next five years.

The top four major concerns in the next five years were similar to those identified for the next 12 months. Milk price, input costs, pasture/fodder and seasonal conditions.

Seasonal conditions were not seen as highly important in last year's survey and since the dry start to the season in 2018 has been elevated in importance alongside pasture and fodder.

Figure 22 Major issues for individual businesses – 12 month outlook

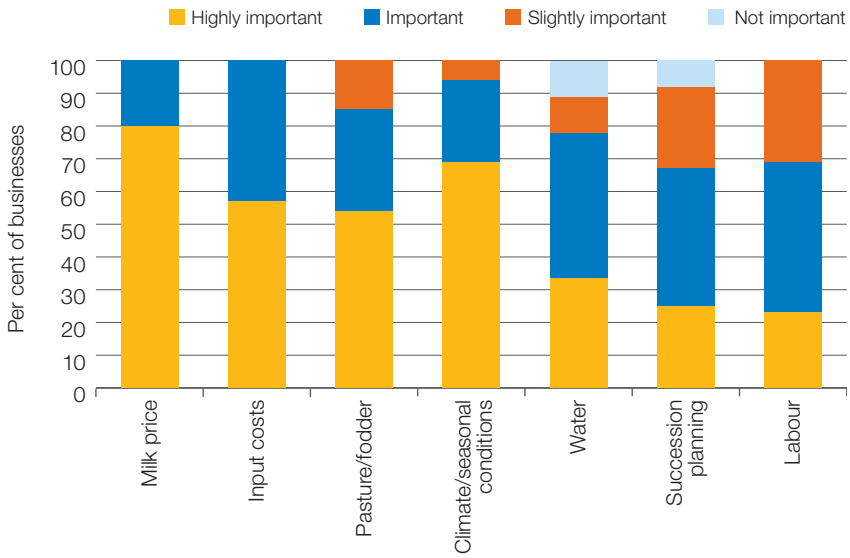
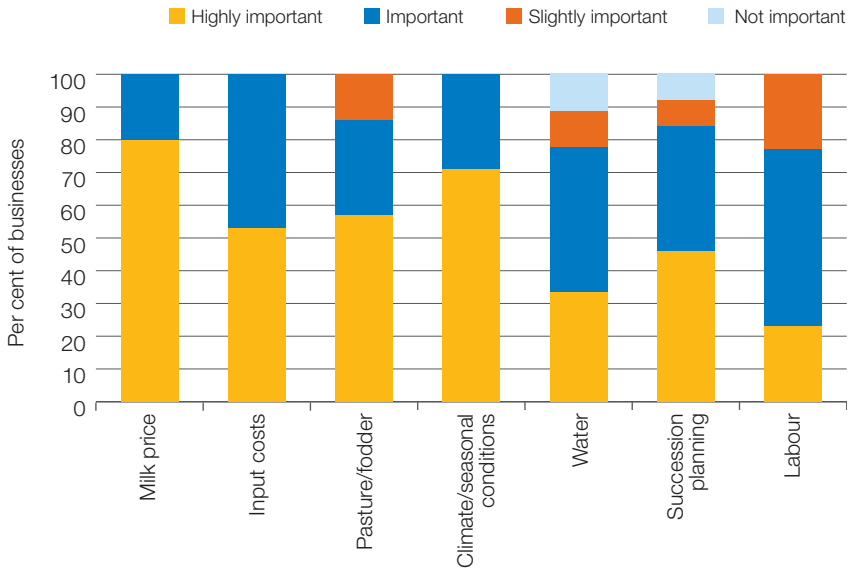


Figure 23 Major issues for individual businesses – 5 year outlook



Greenhouse gas emissions

The average level of emission from participating farms was 14.14 t CO_2-e/t MS in 2017–18 down from last year's 14.2t CO_2-e/t MS.

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 (CO_2-e/t MS).

In 2016 the method of estimating Australia's dairy industry greenhouse gas emissions was amended 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). Other changes have included a decrease in the proportion of waste (dung and urine) deposited onto pastures while the milking herd graze and 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. These are the greenhouse gases emitted with the manufacturing of fertilisers and the production of purchased fodder, grain and concentrates.

The methodologies introduced in 2016 have been consistently applied for the 2017–18 report.

The distribution of different emissions for 2017–18 is shown in Figure 24. Greenhouse gas emissions per tonne of milk solids produced ranged from 12.56 t CO_2-e/t MS to 16.63 t CO_2-e/t MS with an average emission level of 14.14 t CO_2-e/t MS. The percentage breakdown for emissions in 2017–18 was 64% for CH_4, 25% for CO_2, and 11% for N_2O emissions.

Methane was identified as the main greenhouse gas emitted from dairy farms, accounting for 64% 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% of total emissions. Methane from effluent ponds accounted for 9% of total emissions on average across the state in 2016–17.

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.

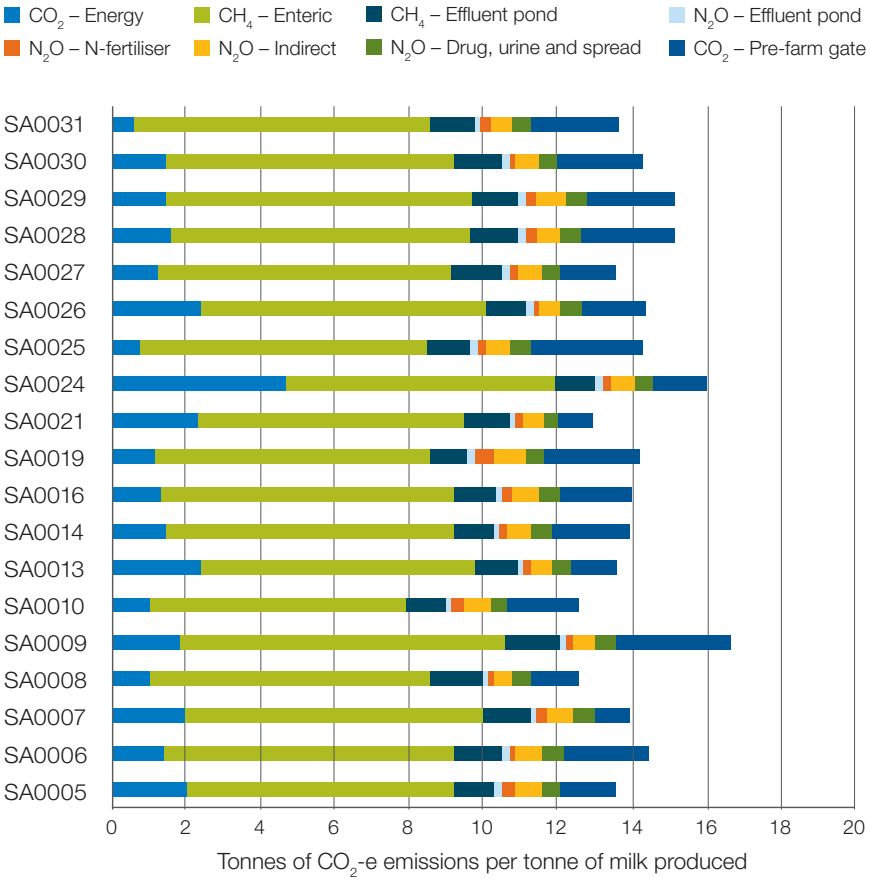
The second main greenhouse gas emission was CO_2 being produced primarily from fossil fuel consumption as either electricity or petrochemicals. The NGGI calculates carbon emissions from both pre-farm gates and on-farm sources. Carbon dioxide accounted for 25% of total emissions 14% from pre-farm gates sources and 11% 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 (e.g. 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 (N_2O), accounting for 11% of total emissions. 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 1% and excreta accounted for 4%. Nitrous oxide from indirect emissions was 5%. 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 need to understand and monitor greenhouse gas emissions that is 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

The dollar values included in this historical analysis are adjusted to 2017–18 equivalent values (allowing for CPI inflation) to allow comparison between years, however, the number of farms in the sample is not consistent. As some farms do not participate each year and new farms are added to the sample, care needs to be taken when comparing performance across years.

In South Australia, 2017–18 milk prices were rebounding from low levels during a year where most received near average rainfall. Both return on total assets and return on equity improved for businesses who maintained a low cost structure as the milk price improved.

Set out in Figure 25 is the average EBIT and net farm income for the six years of Dairy Farm Monitor Project in South Australia. Both EBIT and net farm income initially rose for all participant farms from 2012–13 to 2013–14 before beginning a downward trend from 2014–15 to 2015–16 then rising again in 2016–17 and again in 2017–18

Historically, the low average EBIT of approximately negative $6,900 and net farm income negative $95,689 in 2012–13 was primarily due to low milk prices and high feed costs. In 2012–13, feed costs accounted for 83% of total variable costs.

In 2013–14, EBIT and net farm income rose to an average $345,843 and $230,761, respectively as a result of a good average milk prices of $7.29/kg MS (adjusted for inflation).

Average farm EBIT and net farm income in 2014–15 declined to approximately $229,029 and $93,574 respectively, as a result of lower average milk prices received. The average milk income of $6.68/kg MS in 2014–15 was 8% lower than the $7.29/kg MS received in 2013–14 (adjusted for inflation).

The downward trend continued for average farm EBIT and net farm income in 2015–16, declining further to approximately $170,889 and $39,858 respectively, with average milk prices of $6.40/kg MS (4% lower than 2014–15) being a major contributor.

Last year the average farm EBIT and net farm income increased to $205,279 and $103,487 respectively as a result of increased other farm income and improved seasonal conditions increasing the availability of home grown feed. This reduced the need for purchased feed at lower prices for concentrates and hay, if feed was purchased.

In 2017–18 average EBIT was $294,920 with net farm income of $174,240. This was the second best performance recorded since the high milk price year of 2013–14. The average milk price for this season was $6.24 kg MS which is of significance when compared to previous years' prices (adjusted for inflation) as it is actually the second lowest price in the past six years. The strong 'EBIT' and 'Net Farm Profit' results reported by participants are a reflection of businesses maintaining tight cost control methods (brought on in 2016–17 by low milk prices) into a period of improved prices.

Average return on total assets for 2017–18 was 4.3%, an improvement on the previous year of 3.1% and also above the six year average of 3.3%.

This followed a high of 6.2% return on total assets in 2013–14 and a low of negative 0.6% in 2012–13 (Figure 26).

In all of the past six years, average return on equity has ranged from negative 4.9% (2012–13) to a high of 8.5% in 2013–14 before falling to negative 1.5% in 2015–16 from 3.6% in 2014–15. In 2017–18, average farm return on equity rose to 4.1% up from last year's average of 2.1%.

The average return on equity reported for 2017–18 may also have been influenced by a change to the farms participating in the project having different financing arrangements.

Figure 25 Historical EBIT and net farm income

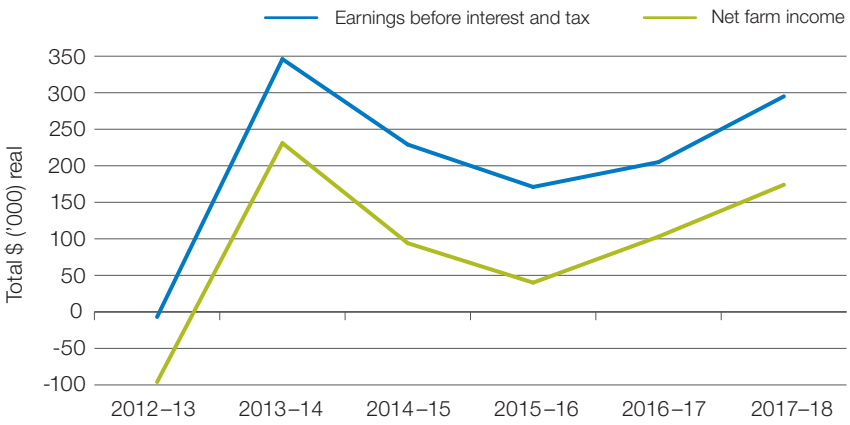
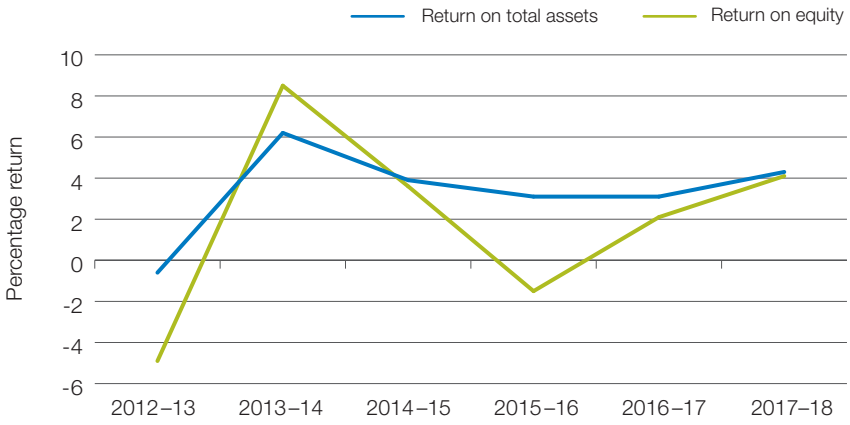


Figure 26 Historical return on total assets and return on equity



Appendices

Appendix A **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 and tax	Return on total assets (exc. capital apprec.)	Interest and lease charges	Debt servicing ratio	Net farm income	Return on equity
	$/kg MS	$/kg MS	$/kg MS	$/kg MS	$/kg MS	%	$/kg MS	%	$/kg MS	% of income	$/kg MS	%
SA0005	6.00	0.41	6.41	2.95	1.88	61	1.58	6.0	0.00	0.0	1.58	6.0
SA0006	6.39	0.66	7.05	3.76	1.59	70	1.71	8.1	0.64	9.1	1.07	12.7
SA0007	7.03	2.07	9.10	3.62	3.76	49	1.72	4.9	0.78	8.5	0.94	4.3
SA0008	5.95	0.57	6.52	2.23	2.50	47	1.79	5.2	0.32	4.9	1.47	5.1
SA0009	8.39	0.49	8.88	3.96	5.82	41	-0.90	-1.3	1.35	15.2	-2.25	-4.2
SA0010	5.63	0.62	6.25	2.77	2.41	53	1.08	3.2	0.85	13.6	0.23	1.2
SA0013	5.74	0.54	6.28	2.85	3.04	48	0.39	1.2	0.09	1.5	0.30	1.0
SA0014	5.78	0.87	6.65	3.92	1.91	67	0.82	5.0	0.27	4.0	0.56	4.6
SA0016	6.46	1.89	8.35	3.81	2.20	63	2.34	7.3	0.64	7.7	1.70	9.8
SA0019	5.99	0.68	6.67	4.07	1.74	70	0.86	3.4	0.89	13.4	-0.04	-0.3
SA0021	6.26	0.26	6.53	3.29	3.10	51	0.13	0.4	0.70	10.8	-0.57	-3.0
SA0024	5.89	0.93	6.82	3.33	2.04	62	1.45	4.8	0.89	13.1	0.56	3.8
SA0025	6.25	0.68	6.94	3.62	2.37	60	0.94	3.4	0.30	4.4	0.64	2.9
SA0026	6.04	0.69	6.73	2.70	1.76	60	2.27	10.1	0.28	4.2	1.99	11.5
SA0027	6.24	0.93	7.17	2.64	2.87	48	1.65	4.3	0.02	0.2	1.64	4.3
SA0028	6.60	0.91	7.51	3.81	1.76	68	1.94	6.1	0.82	10.9	1.12	12.6
SA0029	6.11	0.67	6.78	3.69	1.80	67	1.29	5.2	0.10	1.5	1.19	5.3
SA0030	5.67	0.89	6.56	4.11	2.03	67	0.42	1.6	0.52	7.9	-0.10	-1.9
SA0031	6.05	1.30	7.35	3.47	2.89	54	0.99	2.8	0.72	9.8	0.27	1.9
Average	**6.24**	**0.85**	**7.08**	**3.40**	**2.50**	**58**	**1.18**	**4.3**	**0.54**	**7.4**	**0.65**	**4.1**

Table A2 Physical information

Farm number	Total usable area	Milking area	Total water use efficiency	Number of milking cows	Milking cows per usable area	Milk sold	Milk sold	Fat	Protein
	ha	ha	t DM/100mm/ha	hd	hd/ha	kg MS/cow	kg MS/ha	%	%
SA0005	176	173	1.1	585	3.3	487	1,620	4.6	3.6
SA0006	200	170	0.6	350	1.8	608	1,065	3.7	3.3
SA0007	691	9	1.3	220	0.3	697	222	4.1	3.2
SA0008	444	84	0.5	242	0.5	560	305	4.3	3.3
SA0009	69	14	1.1	102	1.5	373	551	4.9	3.6
SA0010	252	208	0.7	292	1.2	576	668	4.2	3.4
SA0013	340	188	0.5	360	1.1	586	621	4.0	3.3
SA0014	211	152	0.7	422	2.0	548	1,095	3.9	3.4
SA0016	605	103	0.3	383	0.6	687	435	3.9	3.4
SA0019	365	210	0.5	510	1.4	691	966	3.2	3.3
SA0021	1,825	2	0.5	560	0.3	695	213	3.8	3.1
SA0024	240	162	0.6	320	1.3	593	791	3.6	3.3
SA0025	1,960	1,080	0.2	568	0.3	534	155	3.6	3.3
SA0026	603	236	0.7	752	1.2	530	661	4.1	3.8
SA0027	470	200	0.3	235	0.5	494	247	4.1	3.3
SA0028	519	244	0.4	590	1.1	599	682	3.4	3.3
SA0029	289	189	1.0	300	1.0	511	531	4.1	3.3
SA0030	212	120	0.4	226	1.1	517	551	4.1	3.2
SA0031	552	342	0.4	572	1.0	533	552	4.0	3.4
Average	**527**	**205**	**0.6**	**399**	**1.1**	**569**	**628**	**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
SA0005	14.6	0.0	76	294.1	4.9	98.7	130.1	146	71,272
SA0006	5.6	0.7	39	105.3	0.0	0.0	0.0	93	56,890
SA0007	1.4	0.0	73	32.6	15.8	0.0	1.0	55	38,613
SA0008	6.9	0.6	68	18.6	8.1	0.0	2.7	108	60,606
SA0009	0.2	0.0	23	49.0	38.7	0.0	1.7	59	22,017
SA0010	4.2	1.5	58	129.0	7.8	33.0	12.6	108	62,162
SA0013	4.1	3.9	77	59.5	18.9	28.1	26.5	66	38,502
SA0014	7.4	0.0	42	108.8	20.4	104.4	24.8	100	54,733
SA0016	3.4	0.0	46	68.4	3.3	10.9	0.0	69	47,366
SA0019	4.4	0.2	44	279.0	22.4	55.9	5.6	87	60,097
SA0021	0.0	0.0	71	28.4	7.2	7.6	1.8	57	39,676
SA0024	5.7	2.2	66	91.4	15.2	21.4	6.7	108	63,850
SA0025	1.2	0.3	49	21.7	10.9	39.5	35.6	99	52,938
SA0026	8.0	0.0	59	52.2	12.3	0.0	1.0	165	87,741
SA0027	2.6	2.4	66	30.3	6.9	25.2	8.2	74	36,676
SA0028	2.6	0.0	38	97.3	16.2	68.2	38.2	110	66,074
SA0029	3.4	1.5	49	92.8	0.0	15.6	0.0	104	53,265
SA0030	5.5	0.3	48	50.6	18.4	34.0	18.2	99	51,329
SA0031	2.5	0.3	40	66.5	20.7	30.4	24.3	72	38,284
Average	**4.4**	**1.3**	**54**	**88.2**	**13.1**	**30.2**	**17.8**	**94**	**52,742**

*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	Percent of total energy imported
	t DM/hd	$/t DM	$/t DM	$/t DM	$/t DM	$/t DM	% of ME
SA0005	1.2	297		179		285	24
SA0006	4.7	367		207	138	278	61
SA0007	2.4	547		112	219	245	27
SA0008	2.0	243				243	32
SA0009	3.6	300		167		231	77
SA0010	3.0	283	233	138		244	42
SA0013	1.5	297				297	23
SA0014	2.8	326		248		304	58
SA0016	4.6	287		232	188	254	54
SA0019	4.5	302		144	1,367	295	56
SA0021	2.5	430			215	311	29
SA0024	2.1	347				347	34
SA0025	3.0	381		235		367	51
SA0026	2.7	284	165	211		267	41
SA0027	2.2	336		223	122	269	34
SA0028	5.3	297		232	223	259	62
SA0029	3.7	377		271		331	51
SA0030	2.6	422	196	218		325	52
SA0031	4.0	346	358	161	38	254	60
Average	**3.1**	**340**	**238**	**199**	**314**	**285**	**46**

Table A4 Variable costs

Farm number	AI and herd test	Animal health	Calf rearing	Shed power	Dairy supplies	Total herd and shed costs	Fertiliser	Irrigation	Hay and silage making
	$/kg MS	$/kg MS	$/kg MS	$/kg MS	$/kg MS	$/kg MS	$/kg MS	$/kg MS	$/kg MS
SA0005	0.08	0.28	0.02	0.18	0.02	0.58	0.42	0.57	0.00
SA0006	0.11	0.14	0.19	0.12	0.13	0.70	0.07	0.00	0.07
SA0007	0.24	0.09	0.00	0.16	0.11	0.59	0.31	0.00	0.63
SA0008	0.11	0.08	0.00	0.06	0.11	0.36	0.17	0.11	0.07
SA0009	0.16	0.18	0.05	0.28	0.08	0.74	0.17	0.00	0.03
SA0010	0.11	0.20	0.00	0.09	0.11	0.52	0.48	0.00	0.17
SA0013	0.12	0.07	0.01	0.08	0.20	0.48	0.32	0.51	0.23
SA0014	0.13	0.10	0.15	0.10	0.33	0.82	0.33	0.21	0.01
SA0016	0.26	0.18	0.04	0.08	0.05	0.61	0.24	0.02	0.24
SA0019	0.11	0.18	0.15	0.15	0.10	0.70	0.50	0.26	0.28
SA0021	0.07	0.15	0.03	0.27	0.19	0.70	0.53	0.22	0.49
SA0024	0.25	0.17	0.02	0.16	0.10	0.69	0.23	0.31	0.35
SA0025	0.04	0.17	0.12	0.15	0.06	0.53	0.60	0.00	0.07
SA0026	0.07	0.05	0.06	0.17	0.08	0.42	0.14	0.16	0.27
SA0027	0.08	0.05	0.01	0.14	0.21	0.48	0.33	0.00	0.07
SA0028	0.10	0.12	0.02	0.16	0.15	0.56	0.28	0.00	0.23
SA0029	0.09	0.06	0.00	0.15	0.10	0.39	0.20	0.00	0.25
SA0030	0.14	0.08	0.20	0.16	0.25	0.82	0.50	0.08	0.01
SA0031	0.10	0.11	0.00	0.19	0.21	0.61	0.31	0.00	0.04
Average	**0.12**	**0.13**	**0.06**	**0.15**	**0.14**	**0.60**	**0.32**	**0.13**	**0.18**

Farm number	Fuel and oil	Pasture improvement/ cropping	Other feed costs	Fodder purchases	Grain/ concentrates/ other	Agistment costs	Feed and water inventory change	Total feed costs	Total variable costs
	$/kg MS	$/kg MS	$/kg MS	$/kg MS	$/kg MS	$/kg MS	$/kg MS	$/kg MS	$/kg MS
SA0005	0.03	0.03	0.00	0.04	0.67	0.61	0.00	2.37	2.95
SA0006	0.14	0.09	0.19	0.86	1.46	0.06	0.12	3.06	3.76
SA0007	0.28	0.40	0.34	0.07	0.96	0.00	0.03	3.02	3.62
SA0008	0.08	0.26	0.00	0.00	0.92	0.00	0.26	1.87	2.23
SA0009	0.22	0.21	0.00	0.83	1.40	0.18	0.20	3.22	3.96
SA0010	0.09	0.03	0.13	0.35	0.91	0.00	0.11	2.25	2.77
SA0013	0.04	0.13	0.00	0.00	0.75	0.00	0.38	2.36	2.85
SA0014	0.04	0.15	0.00	0.44	1.48	0.22	0.22	3.10	3.92
SA0016	0.15	0.20	0.18	0.37	1.46	0.00	0.35	3.19	3.81
SA0019	0.10	0.13	0.00	0.23	1.76	0.00	0.13	3.38	4.07
SA0021	0.25	0.37	0.04	0.00	1.16	0.00	-0.47	2.59	3.29
SA0024	0.08	0.06	0.16	0.00	1.26	0.00	0.19	2.63	3.33
SA0025	0.08	0.09	0.00	0.13	1.91	0.10	0.12	3.10	3.62
SA0026	0.07	0.14	0.10	0.24	1.21	0.04	-0.11	2.27	2.70
SA0027	0.22	0.09	0.00	0.30	1.23	0.00	-0.07	2.16	2.64
SA0028	0.09	0.10	0.03	0.72	1.49	0.00	0.31	3.25	3.81
SA0029	0.05	0.19	0.00	0.92	1.67	0.00	0.03	3.30	3.69
SA0030	0.04	0.20	0.00	0.69	1.56	0.21	-0.01	3.28	4.11
SA0031	0.14	0.21	0.00	0.27	1.93	0.00	-0.05	2.86	3.47
Average	**0.11**	**0.16**	**0.06**	**0.34**	**1.33**	**0.07**	**0.09**	**2.80**	**3.40**

Table A5 Overhead costs

Farm number	Rates	Farm insurance	Motor vehicle expenses	Repairs and maintenance	Other overheads	Employed labour	Total cash overheads	Depreciation	Imputed owner/ operator and family labour	Total overheads
	$/kg MS	$/kg MS	$/kg MS	$/kg MS	$/kg MS	$/kg MS	$/kg MS	$/kg MS	$/kg MS	$/kg MS
SA0005	0.04	0.08	0.04	0.27	0.08	0.91	1.41	0.46	0.00	1.88
SA0006	0.03	0.06	0.01	0.17	0.10	0.70	1.06	0.12	0.41	1.59
SA0007	0.09	0.21	0.05	0.70	0.22	0.87	2.15	0.57	1.04	3.76
SA0008	0.13	0.07	0.16	0.19	0.20	0.29	1.04	0.58	0.88	2.50
SA0009	0.11	0.17	0.70	0.74	0.61	1.40	3.74	0.55	1.53	5.82
SA0010	0.08	0.09	0.20	0.32	0.16	0.69	1.54	0.33	0.54	2.41
SA0013	0.05	0.06	0.02	0.44	0.16	0.55	1.27	0.42	1.35	3.04
SA0014	0.04	0.03	0.00	0.16	0.21	0.94	1.39	0.15	0.38	1.91
SA0016	0.05	0.11	0.06	0.23	0.13	0.98	1.56	0.39	0.26	2.20
SA0019	0.03	0.05	0.04	0.29	0.18	0.60	1.20	0.23	0.30	1.74
SA0021	0.04	0.10	0.13	0.40	0.20	1.34	2.21	0.53	0.37	3.10
SA0024	0.05	0.08	0.04	0.22	0.14	0.20	0.73	0.39	0.92	2.04
SA0025	0.13	0.04	0.04	0.29	0.08	1.13	1.71	0.19	0.48	2.37
SA0026	0.03	0.02	0.02	0.28	0.12	0.78	1.27	0.49	0.00	1.76
SA0027	0.16	0.18	0.01	0.02	0.05	1.83	2.25	0.50	0.12	2.87
SA0028	0.03	0.06	0.01	0.23	0.07	0.80	1.20	0.27	0.30	1.76
SA0029	0.07	0.03	0.01	0.08	0.11	0.94	1.24	0.19	0.38	1.80
SA0030	0.00	0.03	0.00	0.24	0.15	0.70	1.14	0.11	0.78	2.03
SA0031	0.13	0.04	0.01	0.16	0.27	1.84	2.46	0.20	0.24	2.89
Average	**0.07**	**0.08**	**0.08**	**0.29**	**0.17**	**0.92**	**1.61**	**0.35**	**0.54**	**2.50**

Table A6 Variable costs – percentage

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
SA0005	1.6	5.8	0.4	3.8	0.4	12.1	8.7	11.8	0.0
SA0006	2.1	2.6	3.6	2.2	2.5	13.0	1.4	0.0	1.4
SA0007	3.2	1.2	0.0	2.1	1.4	8.0	4.2	0.0	8.6
SA0008	2.4	1.6	0.0	1.4	2.3	7.7	3.5	2.3	1.5
SA0009	1.6	1.8	0.5	2.9	0.8	7.6	1.7	0.0	0.3
SA0010	2.2	3.9	0.0	1.7	2.2	10.0	9.3	0.0	3.3
SA0013	2.0	1.1	0.2	1.4	3.4	8.2	5.4	8.6	3.9
SA0014	2.3	1.8	2.6	1.8	5.7	14.1	5.6	3.5	0.1
SA0016	4.3	3.0	0.6	1.4	0.9	10.2	3.9	0.3	3.9
SA0019	1.9	3.1	2.6	2.6	1.8	12.0	8.5	4.5	4.9
SA0021	1.1	2.3	0.4	4.2	3.0	11.0	8.3	3.5	7.7
SA0024	4.6	3.1	0.4	2.9	1.9	12.9	4.3	5.8	6.5
SA0025	0.6	2.8	1.9	2.5	1.0	8.8	10.0	0.0	1.1
SA0026	1.5	1.1	1.4	3.7	1.7	9.5	3.2	3.6	6.1
SA0027	1.5	0.9	0.1	2.5	3.7	8.7	6.0	0.0	1.2
SA0028	1.8	2.2	0.4	2.8	2.8	10.0	5.0	0.0	4.1
SA0029	1.6	1.0	0.0	2.6	1.7	7.0	3.6	0.0	4.5
SA0030	2.2	1.3	3.3	2.7	4.0	13.4	8.2	1.3	0.1
SA0031	1.5	1.7	0.0	3.1	3.4	9.6	4.9	0.0	0.6
Average	**2.1**	**2.2**	**1.0**	**2.5**	**2.4**	**10.2**	**5.6**	**2.4**	**3.2**

Farm number	Fuel and oil	Pasture improvement/ cropping	Other feed costs	Fodder purchases	Grain/ concentrates/ other	Agistment costs	Feed and water inventory change	Total feed costs	Total variable costs
	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs
SA0005	0.6	0.7	0.0	0.9	13.8	12.6	0.0	49.0	61.1
SA0006	2.7	1.6	3.5	16.1	27.3	1.1	2.2	57.2	70.3
SA0007	3.8	5.4	4.7	0.9	13.0	0.0	0.5	41.0	49.0
SA0008	1.8	5.5	0.0	0.0	19.4	0.0	5.4	39.5	47.1
SA0009	2.3	2.1	0.0	8.4	14.3	1.8	2.0	32.9	40.5
SA0010	1.7	0.5	2.5	6.7	17.6	0.0	2.1	43.5	53.5
SA0013	0.7	2.2	0.0	0.0	12.7	0.0	6.5	40.1	48.3
SA0014	0.7	2.5	0.0	7.6	25.4	3.7	3.8	53.1	67.2
SA0016	2.5	3.3	2.9	6.1	24.3	0.0	5.9	53.1	63.3
SA0019	1.7	2.3	0.0	3.9	30.2	0.0	2.2	58.2	70.1
SA0021	3.9	5.7	0.6	0.0	18.1	0.0	-7.3	40.5	51.5
SA0024	1.4	1.2	2.9	0.0	23.4	0.0	3.5	49.1	62.0
SA0025	1.3	1.5	0.0	2.2	31.9	1.7	2.0	51.6	60.4
SA0026	1.7	3.1	2.3	5.4	27.2	0.9	-2.5	51.0	60.5
SA0027	4.0	1.6	0.0	5.4	22.3	0.0	-1.4	39.2	47.9
SA0028	1.5	1.9	0.6	13.0	26.7	0.0	5.6	58.4	68.4
SA0029	0.9	3.5	0.0	16.7	30.4	0.0	0.5	60.1	67.2
SA0030	0.7	3.2	0.0	11.2	25.4	3.5	-0.2	53.5	66.9
SA0031	2.2	3.4	0.0	4.3	30.4	0.0	-0.8	44.9	54.5
Average	**1.9**	**2.7**	**1.1**	**5.7**	**22.8**	**1.3**	**1.6**	**48.2**	**58.4**

Table A7 Overhead costs – percentage

Farm number	Rates	Farm insurance	Motor vehicle expenses	Repairs and maintenance	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
SA0005	0.7	1.6	0.9	5.6	1.6	18.9	29.3	9.6	0.0	38.9
SA0006	0.5	1.1	0.2	3.2	1.8	13.0	19.8	2.3	7.7	29.7
SA0007	1.2	2.9	0.7	9.5	3.0	11.8	29.1	7.7	14.2	51.0
SA0008	2.7	1.4	3.4	4.1	4.3	6.2	22.0	12.3	18.5	52.9
SA0009	1.1	1.8	7.1	7.6	6.3	14.4	38.2	5.6	15.7	59.5
SA0010	1.5	1.8	3.8	6.2	3.2	13.3	29.7	6.4	10.4	46.5
SA0013	0.8	1.1	0.4	7.4	2.7	9.3	21.6	7.1	23.0	51.7
SA0014	0.7	0.6	0.1	2.8	3.6	16.1	23.8	2.5	6.5	32.8
SA0016	0.8	1.8	1.0	3.8	2.1	16.3	25.9	6.4	4.3	36.7
SA0019	0.6	0.9	0.7	5.1	3.1	10.3	20.7	4.0	5.2	29.9
SA0021	0.6	1.6	2.0	6.3	3.1	20.9	34.5	8.3	5.7	48.5
SA0024	0.9	1.4	0.8	4.2	2.5	3.7	13.6	7.2	17.2	38.0
SA0025	2.2	0.7	0.7	4.9	1.3	18.8	28.5	3.1	7.9	39.6
SA0026	0.8	0.5	0.5	6.4	2.8	17.5	28.5	11.0	0.0	39.5
SA0027	2.9	3.3	0.2	0.3	0.9	33.2	40.8	9.1	2.1	52.1
SA0028	0.5	1.0	0.2	4.2	1.3	14.3	21.5	4.8	5.3	31.6
SA0029	1.2	0.5	0.1	1.5	2.0	17.2	22.5	3.4	6.9	32.8
SA0030	0.0	0.6	0.1	4.0	2.4	11.5	18.5	1.8	12.7	33.1
SA0031	2.1	0.6	0.2	2.6	4.3	29.0	38.7	3.1	3.8	45.5
Average	**1.2**	**1.3**	**1.2**	**4.7**	**2.7**	**15.6**	**26.7**	**6.1**	**8.8**	**41.6**

Table A8 Capital structure

Farm assets				
	Land value		Permanent water value	
	$/ha	$/cow	$/ha	$/cow
Average	11,719	10,263	4,161	3,031

Other farm assets (per usable hectare)				
Plant and equipment	Livestock	Hay and grain	Other assets	Total assets
$/ha	$/ha	$/ha	$/ha	$/ha
967	2,625	166	355	16,473

Liabilities		
	Liabilities per usable hectare	Liabilities per milking cow
	$/ha	$/cow
Average	4,868	4,753

Equity		
	Equity per usable hectare	Average equity
	$/ha	%
	11,861	71

Table A9 Historical data – 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	6.40	6.40	7.03	0.32	0.36	0.28	0.31	2.96	3.25	3.56	3.91
2013–14	6.83	7.29	7.74	8.25	0.30	0.32	0.26	0.28	3.04	3.24	3.61	3.85
2014–15	6.35	6.68	7.03	7.38	0.29	0.30	0.22	0.23	3.28	3.44	3.79	3.98
2015–16	6.15	6.40	7.10	7.39	0.34	0.35	0.24	0.24	3.13	3.26	3.71	3.86
2016–17	5.78	5.90	6.75	6.89	0.40	0.41	0.27	0.28	2.49	2.54	3.16	3.23
2017–18	6.24	6.24	7.08	7.08	0.31	0.31	0.29	0.29	2.80	2.80	3.40	3.40
Average		**6.48**		**7.34**		**0.34**		**0.27**		**3.09**		**3.70**

Note: 'Real' dollar values are the nominal values converted to 2017–18 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 total assets	Return on equity
2012–13	1.55	1.71	1.60	1.75	3.15	3.46	-0.31	-0.34	0.53	0.58	-0.84	-0.92	-0.6	-4.9
2013–14	1.54	1.65	1.31	1.40	2.85	3.05	1.27	1.36	0.52	0.55	0.75	0.80	6.2	8.5
2014–15	1.50	1.57	1.03	1.08	2.52	2.65	0.72	0.76	0.55	0.58	0.16	0.17	3.9	3.6
2015–16	1.60	1.67	1.00	1.04	2.60	2.71	0.79	0.82	0.57	0.60	0.22	0.23	3.1	-1.5
2016–17	1.68	1.71	1.04	1.06	2.71	2.77	0.88	0.89	0.47	0.48	0.40	0.41	3.1	2.1
2017–18	1.61	1.61	0.89	0.89	2.50	2.50	1.18	1.18	0.54	0.54	0.65	0.65	4.3	4.1
Average		**1.65**		**1.20**		**2.86**		**0.78**		**0.56**		**0.22**	**3.3**	**2.0**

Table A10 Historical data – average farm physical information

	Total usable area	Milking area	Total water use efficiency	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	t DM/ 100mm/ 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	0.7	320	1.2	527	622	4.8	1.2	51	304	334
2013–14	526	164	0.6	453	1.4	469	660	7.9	0.9	57	343	366
2014–15	529	159	0.7	362	1.3	581	738	-11.5	4.1	44	364	382
2015–16	447	131	0.7	355	1.4	586	751	6.4	1.4	48	366	381
2016–17	565	200	0.6	394	1.3	539	630	5.7	1.9	64	304	310
2017–18	527	205	0.6	399	1.1	569	628	4.4	1.3	54	340	340
Average	**489**	**166**	**0.7**	**381**	**1.3**	**545**	**671**	**3.0**	**1.8**	**53**		**352**

*From 2006–07 to 2010–11 estimated grazed pasture and conserved feed was calculated per usable hectare

Appendix B **Glossary of terms**

All other income	Income to the farm from all sources except milk. Includes livestock trading profit, 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 (i.e. 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 i.e. 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 equal 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 farm income minus total variable and total overhead costs.
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 owned. The proportion of the total assets owned by the business.
Feed costs	Cost of fertiliser, irrigation (including effluent), hay and silage making, fuel and oil, pasture improvement, fodder purchases, grain/ concentrates, agistment, lease costs associated with any of the above costs, and feed inventory change.
Feed inventory change	An estimate of the feed on hand at the start and end of the financial year to capture feed used in the production of milk and livestock.
Finance costs	See interest and lease costs.
Full time equivalent (FTE)	Standardised labour unit. Equal to 2,400 hours a year. Calculated as 48 hours a week for 50 weeks a year.
Grazed pasture	Calculated using the energetics method. Grazed pasture is calculated as the gap between total metabolisable energy required by livestock over the year and amount of metabolisable energy available from other sources (hay, silage, grain and concentrates). Total metabolisable energy required by livestock is a factor of age, weight, growth rate, pregnancy and lactation requirements, distance to shed, terrain and number of animals. Total metabolisable 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 net of levies and charges, livestock trading profit and other farm income, exclusive of GST.
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 $30.33 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 solids sold. 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, e.g. 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	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 farm business related external sources. Includes milk factory dividends, interest payments received, and rents from farm cottages.
Overhead costs	All fixed costs incurred by the farm business that do not vary with the level of production. These include cash overhead costs such as employed labour and non-cash costs such as imputed owner-operator labour, family labour and depreciation of plant and equipment. It excludes interest, lease costs, capital expenditure, principal repayments, drawings and tax.
Real terms	Dollar values or interest rates that have no inflation component.
Return on equity (RoE)	Net farm income divided by the value of total equity.
Return on total assets (RoTA)	Earnings before interest and tax divided by the value of total assets under management, including owned and leased land.
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 e.g. house and shed area.
Total water use efficiency	Home grown feed consumed or harvested per 100 mm water applied (rainfall and irrigation) to the usable hectares on the farm.
Variable costs	All costs that vary with the size of production in the enterprise e.g. herd, shed and feed costs (including feed and water inventory changes).
Water inventory change	An estimate of the irrigation water on hand at the start and end of the financial year to capture water used in the production of pasture and crops.

List of abbreviations

AI	Artificial insemination
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
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 1/25 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
RoTA	Return on total assets
RoE	Return on equity
t	Tonne = 1,000 kg
Top 25%	The state average for the top 25% of farms ranked by return on total assets.

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	$1,600	$1,600
R2 Yr heifers	$1,200	$1,200
R1 Yr heifers	$600	$600
Bulls	$2,400	$2,400

Imputed owner/operator and family labour

In 2017–18 the imputed owner/operator and family labour rate was $30/hr based on a full time equivalent (FTE) working 48 hours/week for 50 weeks of the year.





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