Dairy Australia

DAIRY FARM MONITOR PROJECT

SOUTH AUSTRALIA ANNUAL REPORT 2019/20

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 Melissa Hunter, Rebecca Burgess and Kylie Boston from DairySA, and Helen Quinn from Dairy Australia.

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The data collected for this report and the report itself have been produced by Greg Mitchell and Fiona Smith, in conjunction with Dairy Australia.

This document is also available in PDF format on the internet at **dairyaustralia.com.au/dairyfarmmonitor.**

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HOW TO READ THIS REPORT

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

This report is presented in the following sections;

- Summary
- Farm monitor method
- 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 2019/20 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 2018/19 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 2018/19 are in the 2019/20 report. This year, there is one new participating farm bringing the total number of participants to eighteen (LY: 20). 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 2019/20?

The Dairy Farm Monitor Report for 2019/20 includes one change since last year's report.

The standard value for imputed owner operator and family labour has been revised from $30.33 per hour to $32.00 per hour to reflect industry rates and inflation.

SUMMARY

In 2019/20, the data from 18 participating dairy farms in South Australia demonstrated that despite relatively high feed costs, the improvement in milk income resulted in an increase in overall profitability for participant farms.

Despite being a high cost year, an increase in milk price by 18% saw participants achieve an average EBIT of $493,700, the highest in the eight years of the project. Average return on total assets improved to 5.8% for 2019/20, an increase of 65.7% compared to last year at 3.5%.

Average return on equity also increased to 7.9% compared to last year's 2.1%.

This is the eighth 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 industry represents approximately 5.6%, or 488 million litres, of national milk output in Australia. State milk production for 2019/20 was slightly down on the 496 million litres produced in 2018/19.

The 2019/20 year was largely impacted by dry seasonal conditions in Spring across much of South Eastern Australia that followed a late autumn break the preceding year. Rainfall in SA for the first half of the year was below long term average annual rainfall in most areas. The warmer and drier conditions were conducive to good pasture growth in the South East, but other regions did not fare so well. Above average summer rainfall set farms up for a strong Autumn break with improved pasture growth conditions in the second half of the year.

In 2019/20, whilst purchased feed prices remained high, producers managed to leverage the high milk price and increased livestock trading position to maximise their returns.

Seasonal conditions led to a drop in grazed feed resulting in a drop in the reliance on home grown feed to 57% of metabolizable energy.

Fertiliser use increased with an average of 217 kg/ha of nutrients being applied by participants, 56% of which was nitrogen. The increase was largely a result of a strong autumn break with the benefits of the increased fertiliser expected to be seen in the homegrown feed results of next year.

The combination of an 18% rise in milk price and 21% increase in other farm income, more than offset the 9% increase in cost of production, resulting in a significant increase to earnings (EBIT) and Net Farm Income (NFI). This year average EBIT of participating farms was $493,700 (LY: $243,984) and NFI $373,866 (LY: $128,035).

Returns on total assets managed for participating farms increased to 5.8% (LY: 3.5%) and return on equity increased to 7.9% (LY: 2.1%).

A high level of expectation exists for better business returns in 2019/20 based on stable price expectations, increased milk production and reduced costs for purchased feed.

Climate and seasonal conditions are of increasing importance to respondents given their impact on input costs and the ability to maximise homegrown feed.

The average level of emissions from participating farms remained relatively stable at 14.25 t CO2-e/t MS, up from 14.04t CO2-e/t MS last year. The most significant source of on-farm emissions was methane from ruminant digestion.

Historical trends in average milk price continues to drive financial performance reported by participating farms. While comparisons between years need to be made with care, there is an apparent correlation between milk price and the returns of participating farms.

FARM MONITOR METHOD

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

Figure 1 Dairy farm monitor project method

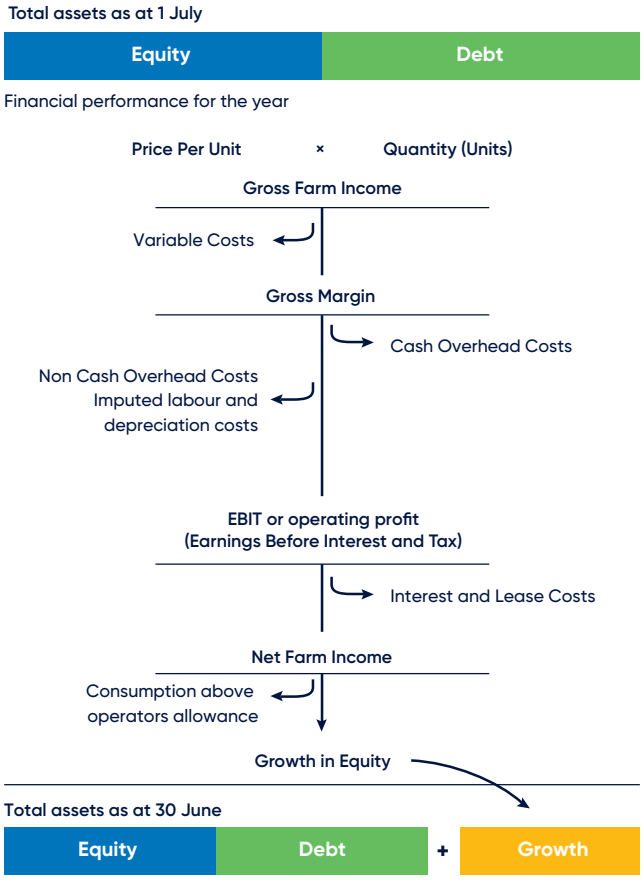
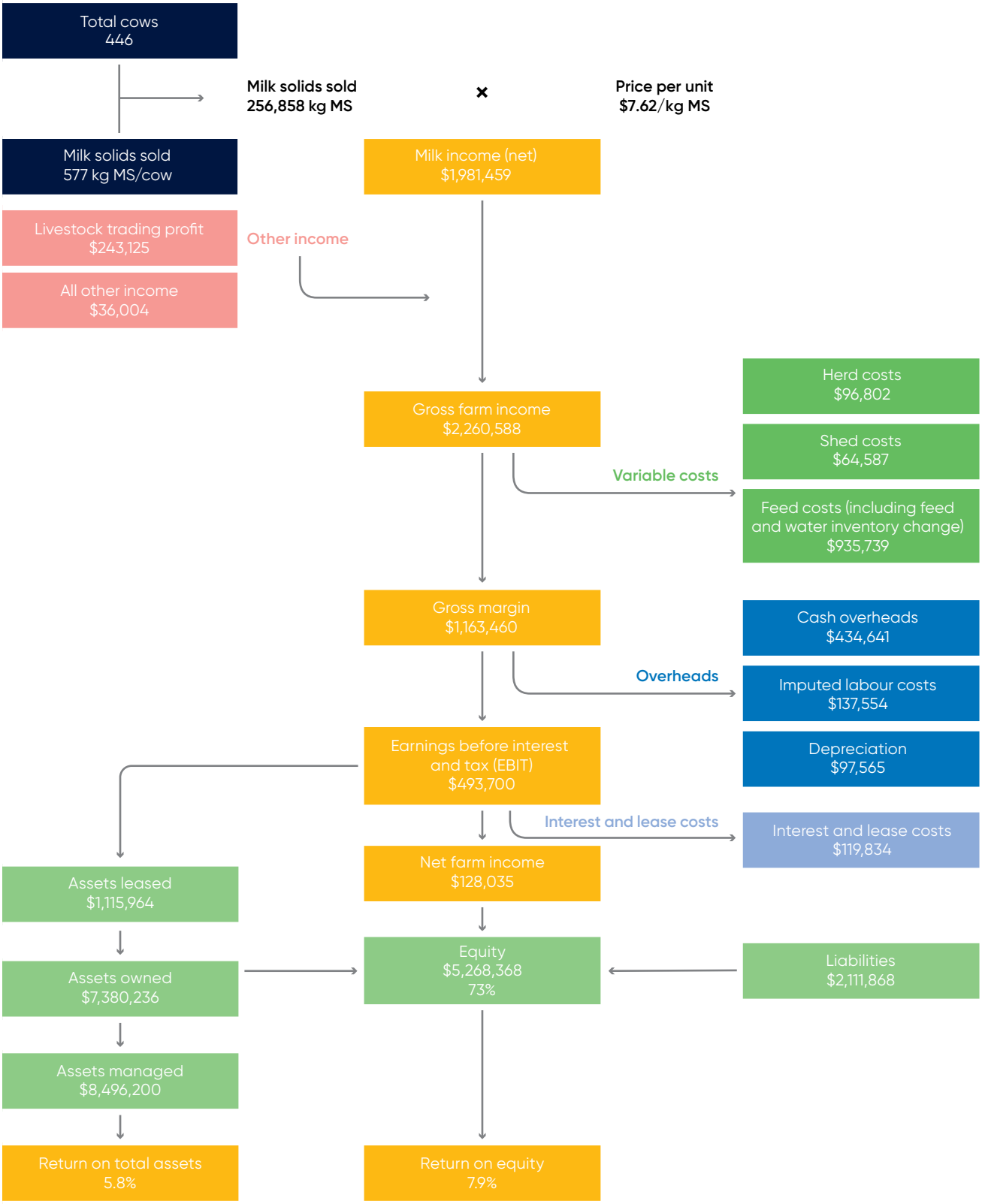


Figure 2 Dairy Farm Monitor Project method profit map* – state average 2019/20 data



* 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 5.6%, or 488 million litres, of the national milk output in the Australian dairy industry, down from 496 million litres in 2018/19.[1]

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.

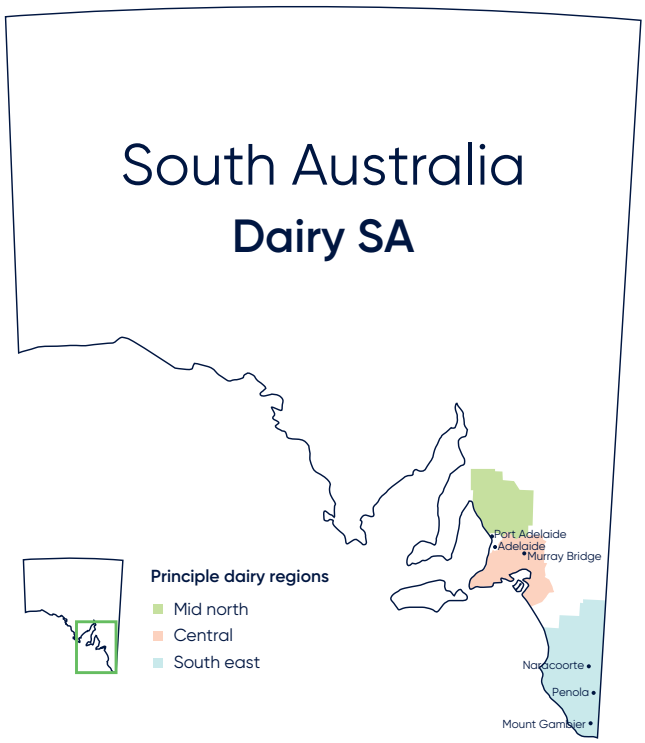
The River and Lakes have a history of being affected by severe water restrictions particularly during the 2000s and drought times. These farms are more dependent on irrigation and natural water flows for fodder production and livestock and domestic purposes than the Mid North, Fleurieu Peninsula and 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 ration' dairies rise in numbers. In the South East of South Australia, the regional strength of high quality underground water sees predominantly irrigated 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 Australia dairying regions



1 In Focus 2019, Dairy Australia, November 2019

Seasonal conditions

Below average spring rainfall during the 2019/20 year, combined with a very late autumn break the previous year limited the pasture growth in the first half of the year with the majority of farms recording annual rainfall that was similar to or below long term average annual rainfall. Above average summer rainfall set farms up for a strong Autumn break with improved pasture growth conditions in the second half of the year.

Below average rainfall in the first half of the year contributed to lower grazed feed per hectare (4.6t DM/ha) than last year (5.3t DM/ha), however participant farms managed to increase the amount of conserved fodder from 0.9 t DM/ha in 2018/19 to 1.1t DM/ha in 2019/20. This drop in homegrown feed, combined with prevailing drought conditions across Southern and Eastern states continued to place pressure on purchased feed prices, although this trend started to improve in the second half of the year.

Seasonal conditions were again below or near average across the dairy regions of South Australia during 2019/20 with only two participant farms recording well above average rainfall for the financial year (Figure 5).

A dry start to 2019 persisted through to the end of April, before good season opening rains in May. For many farms this came too late as soil temperatures dropped below ideal levels for pasture growth.

As a result, average total rainfall of 676mm for participants was 34mm less than long term average. Whilst this was an improvement on the 2018/19 year, most of the benefits of the improvement will not be seen until the 2020/21 year with predicted increases in homegrown feed due to the strong autumn break.

Most dairying regions of the State received below long term average rainfall over the financial year. However, good pasture growth was still evident on farms in the South East due to warmer and drier conditions across winter.

In 2019/20 the ongoing impact of difficult seasonal conditions across Australia resulted in feed prices remaining high. When combined with the lower homegrown feed on farm, participants recorded an increase in overall feed costs in their businesses.

The strong autumn break in 2020 and good spring conditions at the time of data collection has provided expectations of increased homegrown feed for the coming year and positivity about the likelihood of lower overall purchased feed costs.

Figure 4 Monthly average rainfall (all farms)

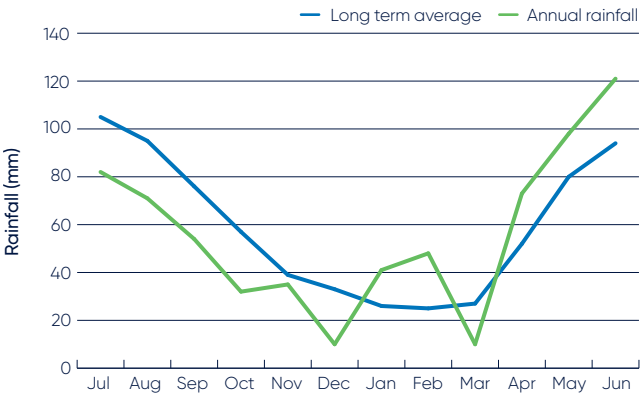
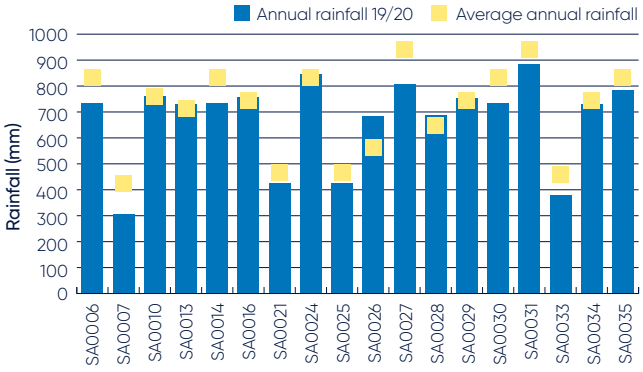


Figure 5 2019/20 annual rainfall and long term average rainfall of participant farms



WHOLE FARM ANALYSIS

The 2019/20 year produced the second best performance, since the inception of the project eight years ago, with return on total assets managed for participating farms being 5.8% compared with 3.5% last year. This year saw the highest historical earnings before interest and tax at $1.84 per kg milksolids on the back of the highest milk price received to date in the project.

The average herd size of participating farms increased to 446 cows in 2019/20 (LY: 414) and usable area increased to 592 ha (LY: 573 ha). This resulted in a marginal drop in the average stocking rate from 1.1 to 1 milking cows per hectare.

The increase in usable area also led to a 3.5% reduction in the average milk sold per hectare, from 600 kg MS/ha to 579 kg MS/ha.

Average milk sold per cow remained relatively stable at 577 kg MS/cow (LY: 574 kg MS/cow).

Water use efficiency averaged 0.6 t DM/100mm/ha across participating farms in line with last year. This was on the back of higher average rainfall but lower average megalitres of irrigation water applied across participant farms compared to 2018/19. Participants with irrigation increased the average in water use efficiency capitalizing on pasture production in the drier months in summer and autumn.

The proportion of home grown feed in the diet decreased from 61% of metabolisable energy (ME) last year to 57%. Home-grown feed as a proportion of ME consumed had a wide spread with a range from 23% to 84% (LY: 30%-81%). The wide spread in home grown feed production is due to the variation of production systems in South Australia.

Labour efficiency declined to 87 milking cows/FTE from 94 last year with a corresponding 6.4% drop in milksolids per FTE from 52,922 last year to 49,515 in 2019/20. The Q1 to Q3 range was 69 to 99 milking cows/FTE which represents the variation in the scale of farms and livestock management systems across the state. The Q1 to Q3 range on milksolids per FTE grew compared to last year, being between 39,646 to 60,851 kg MS/FTE (LY: 44,141 to 60,081 kg MS/FTE).

Table 1 Farm physical data

Farm physical parameters	State average	Q1 to Q3 range	Top 25% average
Annual Rainfall 19/20	676	684–760	667
Herd size	446	302–614	453
Total water use efficiency	0.6	0.5–0.7	0.7
Total usable area (hectares)	592	285–670	382
Milking cows per usable hectares	1.0	0.9–1.2	1.4
Milk sold (kg MS /cow)	577	529–615	576
Milk sold (kg MS /ha)	579	467–710	799
Home grown feed as % of ME consumed	57	50–65	55
Labour efficiency (cows / FTE)	87	69–99	103
Labour efficiency (kg MS / FTE)	49,515	39,646–60,851	58,835

Gross farm income

Gross farm income is inclusive of milk sales, livestock trading and income from other farm sources such as rental from houses.

Gross farm income for participants in 2019/20 combined an average of 88% milk income and 12% from all other income as was the case in the previous two years.

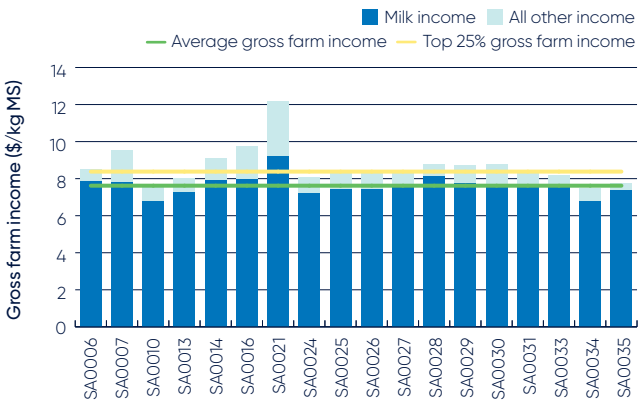
Figure 6 displays the gross farm income for participant farms throughout the South Australian dairying areas. Gross farm income across participants averaged $8.64/kg MS with the top 25% of participants receiving a lower average gross farm income at $8.38/kg MS.

The average milk income received was $7.62/kg MS in 2019/20, an increase of 18% on last year's average $6.46/kg MS. This increase is on top of the 4% price increase reported in 2018/19.

The Q1 to Q3 range for milk income received was $7.39 to $7.87/kg MS, a difference of 48c between Q1 and Q3 (LY: $6.18 to $6.85/kg MS). This gap decreased compared to last year, meaning there was less variation in price received by participants in the survey.

Participant farmers also received an average of $1.03/kg MS from all other income, up from $0.86/kg MS. Income from livestock trading increased to $0.89/kg MS from $0.75/kg MS last year with Other Farm Income doubling from $0.06/kg MS to $0.12/kg MS with a considerable number of farms receiving the COVID cash flow boost.

Figure 6 Gross farm income per kilogram of milk solids



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.

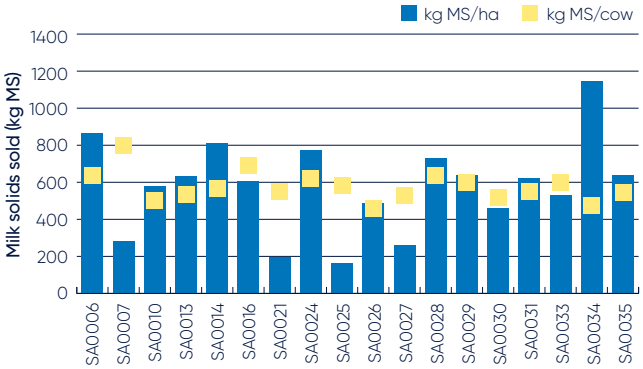
The average quantity of milk solids sold decreased 3.5% to 579 kg MS/ha (LY: 600 kg MS/ha) with participant farms ranging from 163 kg MS/ha to 1,145 kg MS/ha.

The change in production per hectare is a result of a continued increase in land used in milk production, from 573 ha in 2018/19 to 592 ha in the current year. Whilst there was also an increase in the average number of cows milked by participants, there was a small drop in stocking rate from 1.1 to 1 milking cow per hectare.

While the variance is quite large in terms of milk solids per hectare, milk solids sold per cow is relatively even between participants, with a Q1 to Q3 variance between 529–615 kg MS/cow. The kg MS/cow increased marginally to 577 kg MS/cow from 574 kg MS/cow last year.

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.

Figure 7 Milk solids sold



Milk sales versus calving pattern

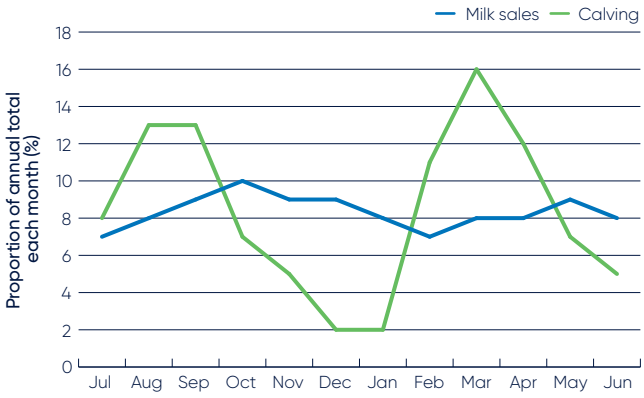
Figure 8 below shows average milk sales for all participant farms against the monthly distribution of cows calving. Whilst year round calving is evident, split calving is the predominant pattern, with defined peaks in spring and autumn.

Whilst there were peaks and troughs in calving, milk sales were relatively stable, although there were relative peaks that corresponded with the calving pattern.

Milk sales recorded the lowest monthly figure amongst participants in February, when Autumn calving commences and grazed feed is in limited supply. A similar dip is evident in July which reflects targeted calving to coincide with optimal spring pasture growth.

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

Figure 8 Milk sales vs calving pattern



Variable costs

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.

The average variable cost of all participant farms was $4.14/kgMS which was an 8.1% increase on last year at $3.83/kgMS, with feed costs contributing significantly to the increase. The range was $2.66/kgMS to $5.68/kgMS with the Top 25% averaging $3.80/kgMS.

There are distinct differences between the levels of variable costs between participants shown below (Figure 9). While herd and shed costs were relatively similar across participant farms, there was significant variation in the feed costs.

In 2019/20, average herd costs increased 24% to $0.36/kg MS (LY $0.29/kg MS), largely on the back of increased spending on AI & Herd testing. Shed costs however saw a smaller increase from $0.24/kg MS to $0.26/kg MS mainly due to higher spending on dairy shed power.

Feed costs contribute significantly to the costs of participant farms being 85% of variable costs. Average home grown feed as a percentage of ME consumed for 2019/20 decreased to 57% at an average price of $1.08/kg MS. This is an increase in cost of $0.06/kg MS from last year, with a portion of this increase being due to the strong autumn break resulting in increased spending on fertiliser and pasture renovation with participants aiming to increase homegrown feed for the 2020/21 year ahead.

The trend in purchased feed costs continued upwards in 2019/20 with an increase of 11% to $2.53/kg MS (LY:$2.28/kg MS) largely on the back of increased concentrate prices and higher purchased fodder fed in the diet due to sustained challenging seasonal conditions.

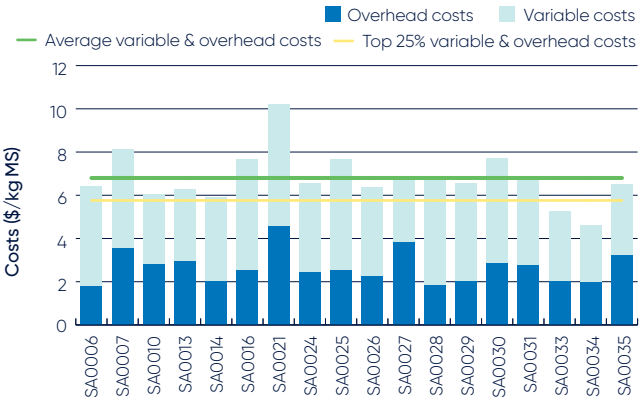
The average cost of concentrates was $505/t DM ($455/t as fed), up from $485/t DM ($437/t as fed) last year. The cost of concentrates includes the cost of additives and minerals. Participant farmers fed an average of 2.1t DM/head concentrates to the milkers, up marginally from the 2t DM/head last year, although this figure includes concentrates fed to young stock on the milking area.

Whilst the price of purchased hay, remained steady at $325/t DM, the overall purchased fodder in the diet increased from 0.7t DM/head to 1.1t DM/head resulting in an overall increase in purchased fodder costs. This was the flow on effect of long term drought conditions throughout Australia causing a shortage in overall fodder supplies.

The Q1 to Q3 range of purchased feed and agistment costs between $2.00/kg MS to $3.39/kg MS reflects the difference between dairy production systems in South Australia and greater availability of home grown feed in some regions.

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

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 increased by 11% to $2.66/kg MS for the survey up from $2.40/kg MS in 2018/19. The largest contributors to the increase were repairs and maintenance, up $0.07/kg MS (24%) and employed labour costs up $0.13/kg MS (15%) compared to last year.

The overhead costs this year ranged from $1.77/kg MS to $4.55/kg MS. Farms that regularly perform well, do so by keeping overhead costs per kg MS low and managing variable costs according to the season.

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 profit 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 $6.80/kg MS up from $6.22/kg MS last year.

Dairy participants increased livestock inventories over the year, resulting in an average write back of $0.13/kg MS and they were able to build feed inventory across the year, largely due to a strong autumn break enabling feed inventories at year end.

The average increase in cost of production of $0.55/kg MS, to $6.88/kg MS was offset by the $1.16/kg MS increase in average milk price received – which contributed to the increase in earnings before interest and tax (EBIT).

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

Table 2 Total variable and overhead costs

Average Farm Financial Performance	Average	Q1 to Q3 range	Top 25% average
Farm costs			
Income ($/kgMS)			
Milk income (net)	7.62	7.39–7.87	7.59
Livestock trading profit	0.89	0.66–1	0.75
Other farm income	0.02	0–0.07	0.02
Total income	8.64	8.08–8.77	8.38
Variable costs			
Herd cost	0.36	0.30–0.39	0.33
Shed cost	0.26	0.21–0.31	0.21
Home grown feed cost	1.08	0.77–1.3	0.89
Purchased feed and agistment	2.53	2–3.39	2.53
Feed inventory change	-0.08	-0.11–0	-0.16
Water inventory change	0.00	0–0	0.00
Total feed costs	3.53	2.87–4.13	3.26
Total variable costs	4.14	3.33–4.84	3.80
Gross margin ($/kgMS)	**4.50**	**4–4.81**	**4.58**
Overhead costs			
Employed labour	1.02	0.72–1.19	0.77
Repairs and maintenance	0.36	0.23–0.44	0.27
All other overheads	0.32	0.2–0.41	0.26
Imputed labour	0.57	0.34–0.79	0.43
Depreciation	0.39	0.21–0.52	0.22
Total overhead costs	2.66	2.01–2.93	1.96
Variable and overhead costs	**6.80**	**6.32–7.44**	**5.76**
Earnings before interest and tax ($/kgMS)	**1.84**	**1.52–2.07**	**2.62**

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.

The average EBIT for participating farms in 2019/20 increased to $1.84/kg MS compared to $1.09/kg MS last year. This was mainly due to the higher milk income more than offsetting the increase in costs.

All participants had a positive EBIT result with a range of $0.69 to $3.18/kg MS. The top quartile averaged EBIT of $2.62/kg MS, up from $1.71/kg MS in 2018/19.

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 2019/20 the RoTA achieved by participant farms was between 2.2% and 14.2%. With higher returns achieved, half the participants fell into the 0%-5% range, with seven farms in the 5%-10% range and 2 farms achieving a RoTA of more than 10 percent (figure 11).

The average RoTA for participants across South Australia for 2019/20 was 5.8%, up from 3.5% last year. The top 25% of participants achieved a 10% return on total assets managed. It is worth noting that a number of participant farms revalued their farms at the beginning of the 2019/20 year on the back of both bank revaluations and land sales in their area, indicating a long term increase in land values for their respective regions. This will have impacted the RoTA results.

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

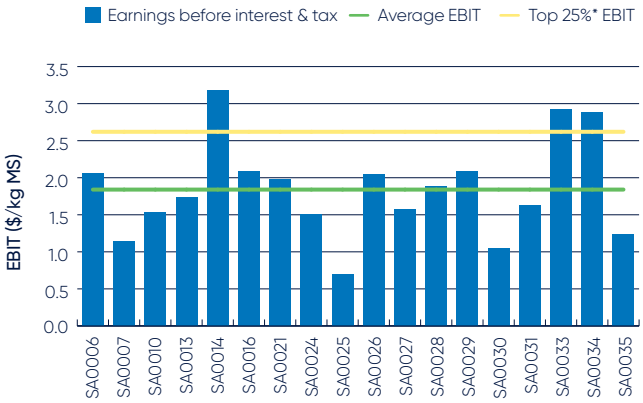
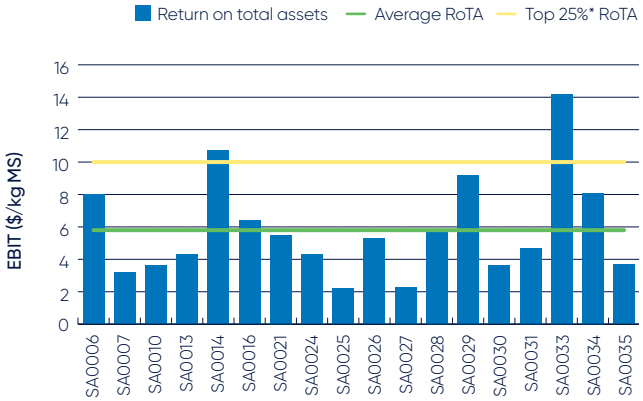


Figure 11 Distribution of farms by return on total assets

Figure 12 Return on total assets



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 2019/20, all participant farms had a positive RoE. The average RoE for participating farms this year was 7.9% (ranging from 1.6% to 21.5%), compared to 2.1% in 2018/19.

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

Figure 13 Distribution of farms by return on equity

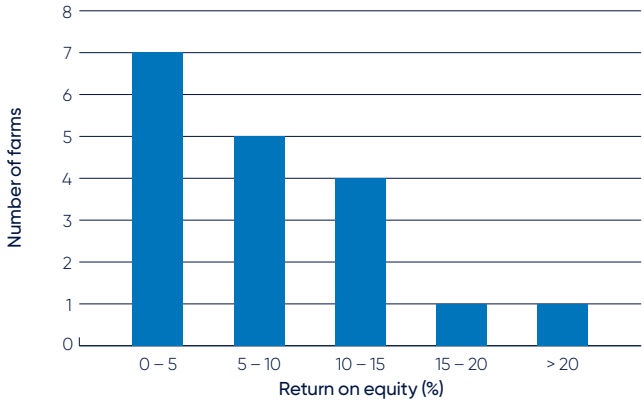
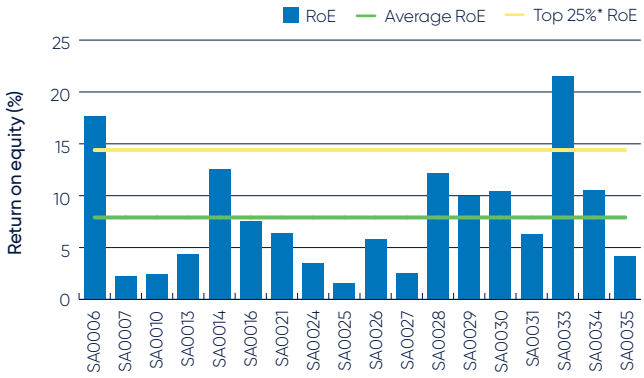


Figure 14 Return on equity



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…"[2]

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

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.

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

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 ability to quickly reduce costs in response to changes in the operating environment. Table 3 shows that across the state for every $1.00 of cost, $0.61 was used to cover variable costs in 2019/20. 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 5% this year is lower than last year. It indicates that on average farms paid $0.05 from every dollar of gross farm income to their creditors.

Equity levels reported by participating farms remained consistent with last year, averaging 73% (LY: 72%). Caution should be exercised when comparing equity levels between years as the participating farms in the survey sample changes from year to year.

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 2019/20, fourteen of the 18 (78%) participant farms received a RoE greater than their RoTA, up from 25% last year.

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 2019/20 to an average 43% (LY: 39%) which is in line with the years prior to 2018/19 which have ranged from 43%-52%.

Table 3 Risk indicators – Statewide

	Statewide
Cost structure (percentage of total costs as variable costs)	61%
Debt service ratio (percentage of income as finance costs)	5%
Debt per cow	$4,416
Equity percentage (ownership of total assets managed)	73%
Percentage of feed imported (as a % of total ME)	43%

PHYSICAL MEASURES

South Australian participant farms exhibited a wide range of feeding systems, including naturally grazed, total mixed ration and feedlot / cut and carry dairies. The average South Australian dairy produces milk from roughly equal portions of grass, fodder and grain with 57% of the diet coming from home-grown feed.

Nitrogen fertiliser use increased on last year with, with an average of 129 kg/ milking ha being applied by participants, up 29% on last year.

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 12 of 18 participants (67%), compared with 13 of 20 (65%) in 2018/19. This is indicative that participants are trying to reduce reliance on purchased feed costs at high prices. With two participant farms considered as TMR farms (total mixed ration), directly grazed pasture represented 40% on average of ME consumed (2018/19: 48%).

Concentrates were the second most utilised source of total ME fed to livestock with an average of 32% (LY: 29%) of total ME fed. The average price for concentrates increased 4% to $505/t DM in 2019/20 on top of the 43% increase in the previous year (2018/19: $485/t DM; 2017/18 $340/t DM).

Hay's contribution to ME increased marginally from 12% to 13% as a proportion of ME and silage once again represented 13% of ME. Other feed contributed the remaining 2% 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 for the consumption of pasture that occurred only on the milking area whether by milking, dry or young stock.

Figure 15 Sources of whole farm metabolisable energy

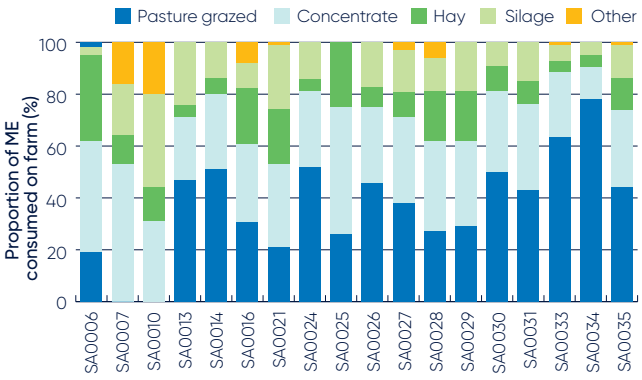
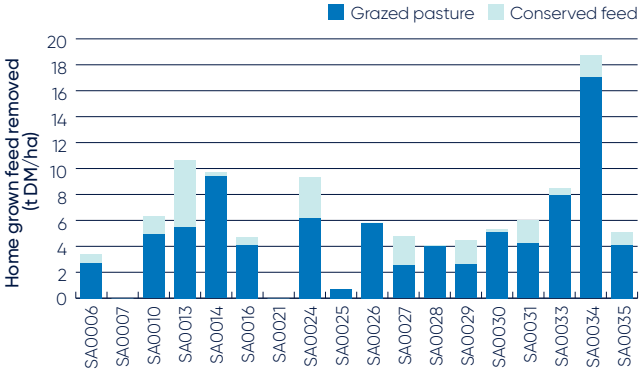


Figure 16 Estimated tonnes of home grown feed removed per milking area hectare



The range of home grown feed consumed per milking hectare varied greatly among the participant producers as shown in Figure 16 depending on the dairy systems employed.

The average total homegrown feed harvested (grazed and conserved) from the milking area was 6t DM/ha, down from last year's 6.3t DM/ha. The estimated pasture consumed as grazed feed on the milking area decreased to 4.8 t/ha (LY: 5.3 t DM/ ha), however conserved feed increased to 1.1 t/ha (LY: 0.9 t DM/ha) coming from conserved fodder.

The top 25% once again had considerably higher homegrown feed harvested at 8.9 t DM/ha. These businesses understand that the land is a resource, and managing all the pasture well is essential to lower the cost of production. Varied growing seasons across South Australia can make it difficult for all operators to actively manage the land resource available to them.

Both Figures 15 and 16 were estimated using the pasture consumption calculator in DairyBase.

This involves a calculation of the total ME required on the farm, based on 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 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.

Fertiliser use increased in 2019/20 compared to last year, which was largely due to increased applications as a result of milder winter weather and a strong autumn break.

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.

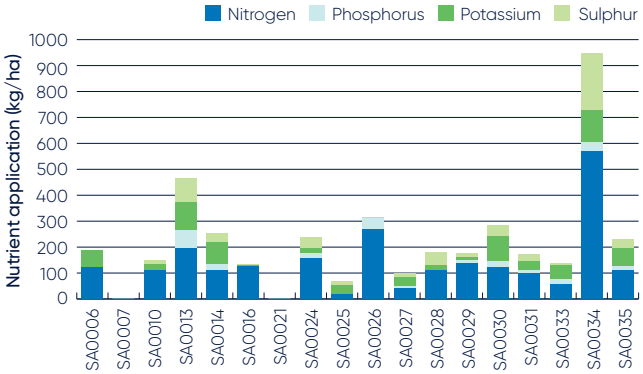
Figure 17 shows the range of application rates used on properties. It should be noted that seasonal variation, water availability, pasture species, soil type and fertility along with pasture management all influence pasture growth and fertiliser application strategies.

The use of nitrogen on farm varies greatly between participants. Of those farms who rely on grazed pasture (i.e. excluding feedlot/cut and carry) nitrogen use ranged from almost 17 kg/ha to 570 kg/ha, with an average of 129 kg/ha. Distribution varies per farm but is used in higher quantities by irrigators.

Phosphorous use ranged from 1 to 70 kg/ha at an average of 17 kg/ha. Potassium use ranged from 0 to 125 kg/ha at an average of 43 kg/ha. Sulphur use ranged from 2 to 220 kg/ha at an average of 35 kg/ha.

Further information on fertiliser application can be found in Appendix Table A2.

Figure 17 Fertiliser application per milking hectare



Business confidence survey

Expectations and issues

Following higher average profits in the 2019/20 year and a strong autumn break, predicted to assist with increased homegrown feed and lower purchased feed costs, participants had a high level of expectation for better business returns in 2020/21. This was based on stable milk price expectations, increased milk production and reduced costs for purchased feed.

Expectations for business returns

Expectations for the 2020/21 year are positive with all but two respondents expecting an improvement to their returns as was the case last year.

The positive attitude is a result of expectations of increased milk production, reduced purchased feed costs and good pasture availability across the South East and Fleurieu at the time of the survey.

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 2020/21 milk price announcements which also provided some level of optimism.

Price and production expectations – milk

With the 2020/21 opening milk prices already announced at the time of the survey, five respondents expected their milk price to increase in the next 12 months with 13 expecting milk prices to remain stable (Figure 19).

As was the case last year, 61% (LY: 65%) of respondents expect milk production to increase while 39% expect milk production to remain stable.

Production expectations – fodder

The favourable autumn break and mild start to winter was consistent with optimism across participant farms for fodder production to increase (50% of farms) or remain stable (39%) in 2020/21 with only 2 farms expecting a decrease in fodder production (Figure 20).

Figure 18 Expectation of business returns

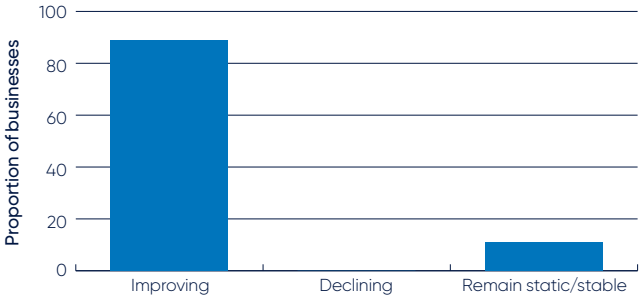


Figure 19 Price and production expectations – milk

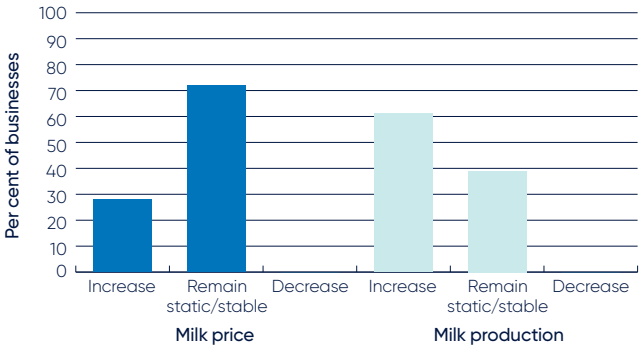
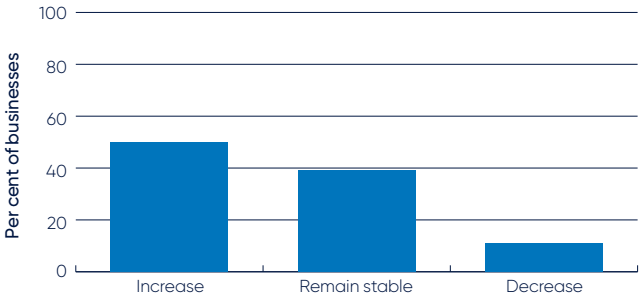


Figure 20 Producer expectations – fodder



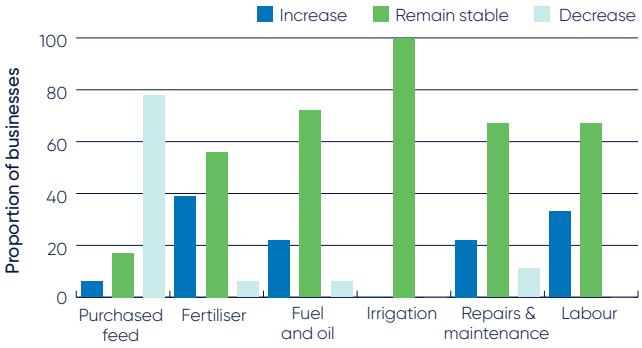
Cost expectations

Data in Figure 21 represent the expectations with regard to costs in 2020/21 from South Australian participants. The majority of survey responses were provided once conservation of fodder had started on most farms so they had a good indication of predicted conserved feed tonnages for the year.

The general expectation is that on average, costs will largely remain the same as 2019/20 with the exception that 78% of respondents expect a decrease in purchased feed costs through lower prices and reduced reliance on purchased feed in the diet as they look to maximise the proportion of homegrown feed.

Whilst there were 33% of participants that believed labour costs would increase for 2020/21, this is down on last year when 55% believed they would increase in the year ahead.

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 two most significant issues identified by respondents for the next 12 months in order of importance were milk price and climate/seasonal conditions. Respondents placed more significance on seasonal conditions this year as an overarching issue that impacts input costs, pasture/fodder capabilities and water availability.

Milk pricing remains at front of mind for many participants this year due to the overall impact it has on profitability.

Water, labour and succession planning were less important issues in the short term as seen in previous years.

Major issues facing the dairy industry – the next five years

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

Milk price over the next 5 years continues to be of greatest concern to respondents of the survey. Many consider milk price to be the primary driver of profit for their business. As such it is always front of mind for producers.

As with the 12 month outlook climate/seasonal conditions will continue to remain important given the impacts on input costs and thus the overall cost of production in dairy farm businesses.

Figure 22 Major issues for individual businesses – 12 month outlook

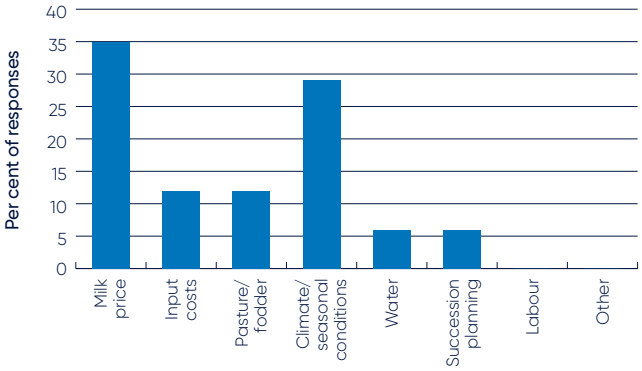
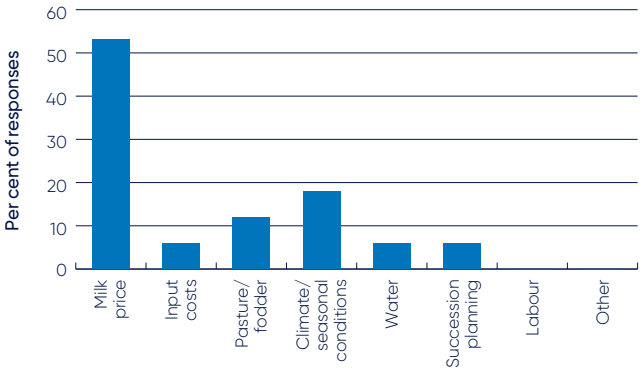
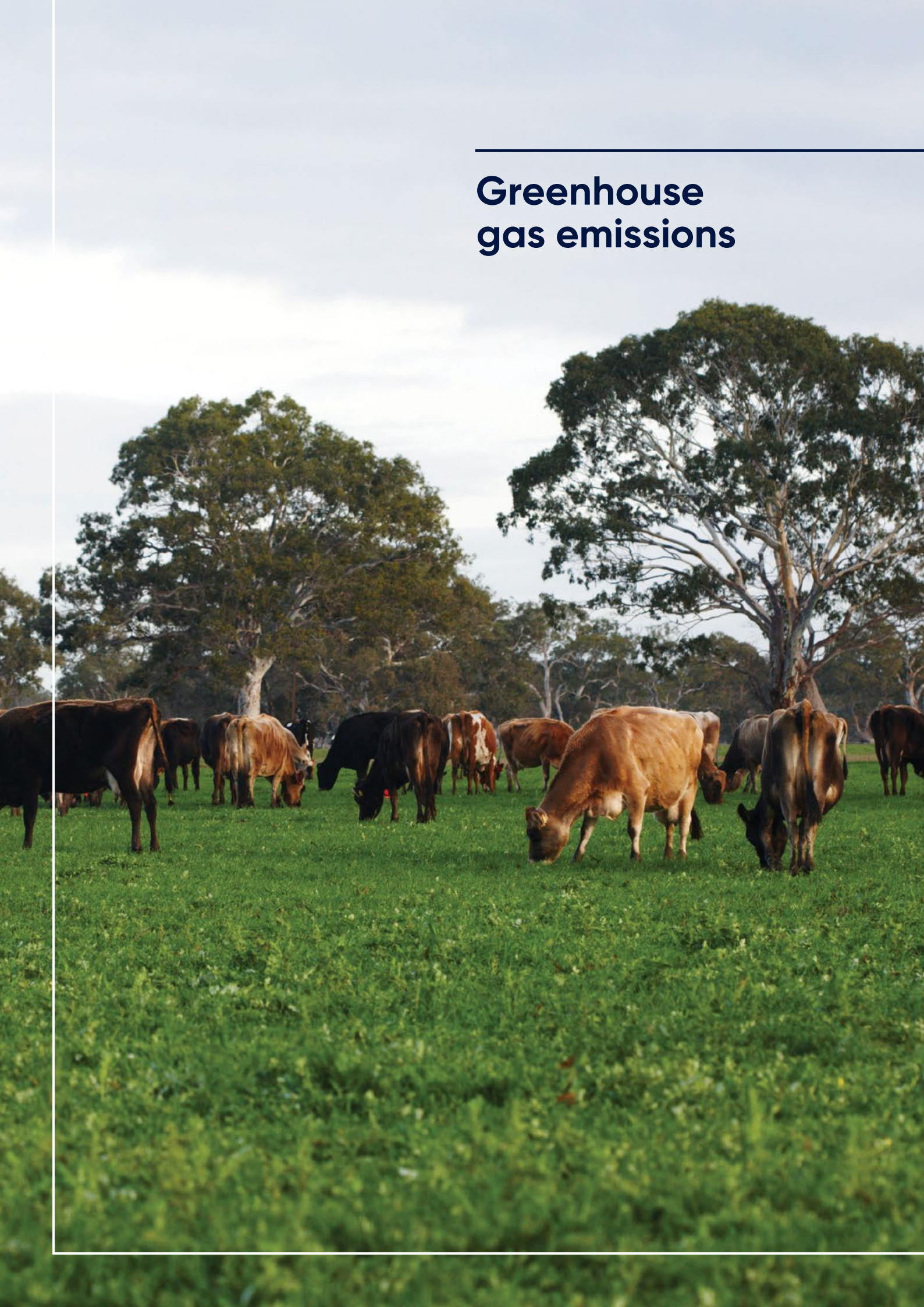


Figure 23 Major issues for individual businesses – 5 year outlook



Greenhouse gas emissions



The average level of emissions from participating farms increased marginally from 14.04 t CO2-e/t MS in 2018/19 to 14.25t CO2-e/t MS. The most significant source of on-farm emissions was methane from ruminant digestion contributing 54% of total farm emissions.

Carbon dioxide equivalents (CO2-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 the data in this section is in CO2-e tonnes and expressed per tonne of milk solids sold (CO2-e/t MS).

The method of estimating Australia's dairy industry greenhouse gas emissions reflects the latest research outcomes and aligns with international guidelines. The GWP for the three gases discussed in this report is 1: 25: 298 (carbon dioxide; CO2: methane; CH4: nitrous oxide; N2O). This year the greenhouse emission was calculated through DairyBase using the Australian Dairy Carbon Calculator.

The distribution of different emissions for 2019/20 is shown in Figure 24. Greenhouse gas emissions per tonne of milk solids produced ranged from 12.84 t CO2-e/t MS to 18.29 t CO2-e/t MS with an average emission level of 14.25 t CO2-e/t MS. This is a slight increase from last year's average of 14.04 t CO2-e/t MS.

The percentage breakdown for emissions in 2019/20 was 62% for CH4, 26% for CO2, and 12% for N2O emissions – which is a similar split to last year.

Methane was identified as the main greenhouse gas emitted from dairy farms, accounting for 62% of all greenhouse emissions. There are two main sources of CH4 emissions on farm: ruminant digestion and anaerobic digestion in effluent management systems. Methane produced from ruminant digestion is known as enteric CH4 and was the major source of emissions from all farms in this report, with an average of 54% of total emissions. Methane from effluent ponds accounted for 8% of total emissions on average across the state in 2019/20.

The second main greenhouse gas emission was CO2 being produced primarily from fossil fuel consumption as either electricity or petrochemicals. The estimation of greenhouse gas emissions includes a pre-farm gate emission source. These are the greenhouse gases emitted during the manufacturing of fertilisers and the production of purchased fodder, grain and concentrates.

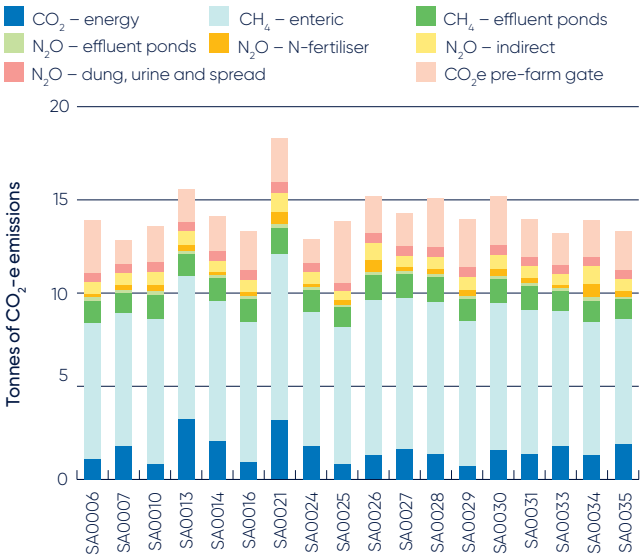
Carbon dioxide accounted for 26% of total emissions, 15% from pre-farm gates sources and 11% from on-farm energy sources. Output levels were highly dependent on the source of electricity used with some farms using coal generated electricity and others using electricity sourced from renewable sources (e.g. solar).

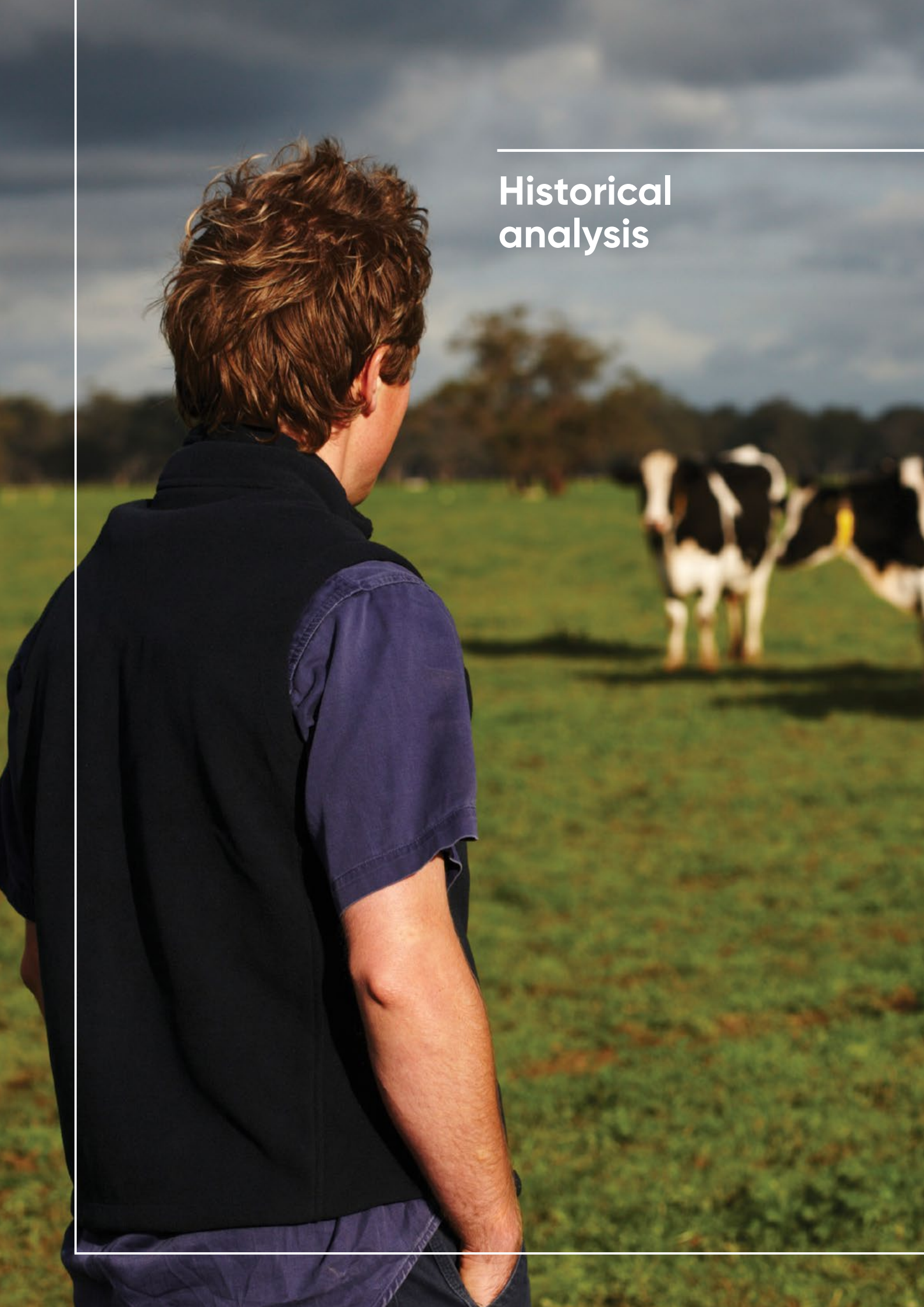
The third main greenhouse gas emission was nitrous oxide (N2O), accounting for 12% of total emissions. Nitrous oxide emissions on dairy farms are primarily derived from direct emissions, including nitrogen fertiliser application, effluent management systems and animal excreta (dung and urine), as well 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 N2O. Strategic fertiliser management practices can reduce N2O emissions and improve nitrogen efficiency.

There is a growing importance to understand and monitor greenhouse gas emissions, and these are likely to become more important into the future. To find detailed information on the Australian National Greenhouse Gas Inventory, strategies for reducing greenhouse gasses and more details on sources of greenhouse gases on dairy farms visit the Australian Department of the Environment's website at **www.environment.gov.au/climate-change.**

Figure 24 Greenhouse gas emissions per tonne of milk solids produced





Historical analysis

The 2019/20 year saw a significant improvement in business performance with participant farms achieving the second highest RoTA and ROE in real terms in the history of the project. EBIT and net farm income were at the highest level seen in the eight years on the back of the highest real milk price, despite a continuing trend of higher input prices and increased cost of production.

This section compares the performance of participant farms in the Dairy Farm Monitor Project over the past eight years. While figures are adjusted for inflation to allow comparison between years it should be noted that the same farms do not participate each year and care needs to be taken when comparing the performance across years.

Set out in Figure 25 is the average EBIT and net farm income for the eight years of Dairy Farm Monitor Project in South Australia. Whilst EBIT and net farm income initially rose, the high in 2013/14 was followed by a decline and volatility with 2019/20 producing the best result across both EBIT and Net Farm Income since the projects inception.

EBIT and net farm income both improved significantly, 100 and 188% respectively in 2019/20 on the back of the highest average milk price received of $7.62/kg MS, well above the eight year average of $6.77/kg MS.

In 2019/20 the average EBIT per farm was $493,700 and net farm income was $373,866, with both well above their long term averages of $251,709 and $133,108 respectively.

This years RoTA of 5.8% is above the eight year average of 3.6% but below the high of 2013-14 of 6.2% when milk price in real terms sat at $7.54/kg MS.

The average RoE improved from 2.1% to 7.9% in 2019/20 which is significantly higher than the eight year average of 2.7%

The 2019/20 year saw milk price improve by 17% with a corresponding improvement in other farm income. While production costs rose and feed prices remained high, the higher income meant the profit margin was higher for participant farms.

The average return on equity reported for 2019/20 may also have been influenced by a change to the farms participating in the project having different financing arrangements.

The dollar values included in this historical analysis are adjusted to 2019/20 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.

Figure 25 Historical EBIT and net farm income

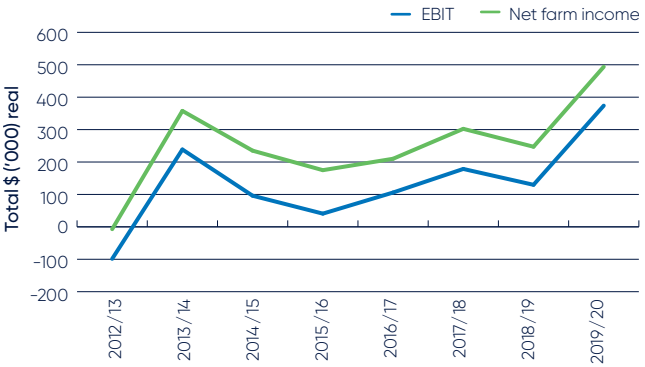
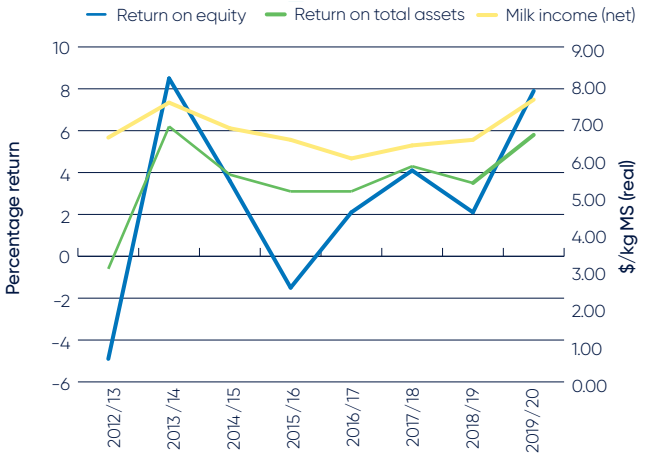


Figure 26 Historical return on total assets (LHS), return on equity (LHS) and milk price (RHS)



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	%
SA0006	7.88	0.61	8.49	4.67	1.77	73%	2.06	8.0%	0.63	7.5%	1.42	17.7
SA0007	7.82	1.46	9.28	4.62	3.52	57%	1.14	3.2%	0.54	5.9%	0.59	2.3
SA0010	6.75	0.82	7.57	3.23	2.81	53%	1.53	3.6%	0.92	12.2%	0.61	2.4
SA0013	7.25	0.77	8.02	3.33	2.96	53%	1.73	4.3%	0.40	4.9%	1.33	4.4
SA0014	7.90	1.20	9.10	3.91	2.01	66%	3.18	10.7%	0.18	2.0%	3.00	12.6
SA0016	7.94	1.82	9.77	5.16	2.52	67%	2.09	6.4%	0.59	6.0%	1.50	7.6
SA0021	9.18	3.02	12.21	5.68	4.55	55%	1.98	5.5%	0.71	5.8%	1.27	6.4
SA0024	7.23	0.82	8.05	4.08	2.45	62%	1.51	4.3%	0.83	10.3%	0.68	3.5
SA0025	7.43	0.89	8.33	5.10	2.54	67%	0.69	2.2%	0.28	3.3%	0.42	1.6
SA0026	7.42	1.04	8.46	4.16	2.24	65%	2.05	5.3%	0.17	2.0%	1.88	5.8
SA0027	7.60	0.71	8.31	2.94	3.80	44%	1.57	2.3%	0.19	2.2%	1.38	2.5
SA0028	8.10	0.66	8.76	5.04	1.83	73%	1.88	5.8%	0.70	8.0%	1.18	12.2
SA0029	7.75	0.89	8.64	4.53	2.03	69%	2.08	9.2%	0.05	0.6%	2.03	10.0
SA0030	7.60	1.17	8.78	4.90	2.84	63%	1.04	3.6%	0.57	6.4%	0.48	10.4
SA0031	7.51	0.90	8.41	4.02	2.76	59%	1.63	4.7%	0.74	8.8%	0.89	6.3
SA0033	7.63	0.54	8.17	3.25	2.00	62%	2.92	14.2%	0.29	3.5%	2.63	21.5
SA0034	6.76	0.75	7.51	2.66	1.97	57%	2.88	8.1%	0.30	4.0%	2.58	10.5
SA0035	7.38	0.37	7.75	3.32	3.20	51%	1.23	3.7%	0.12	1.6%	1.11	4.2
Average	**7.62**	**1.02**	**8.64**	**4.14**	**2.66**	**61%**	**1.84**	**5.8%**	**0.46**	**5.3%**	**1.39**	**7.9**
Top 25*	**7.59**	**0.80**	**8.38**	**3.80**	**1.96**	**65%**	**2.62**	**10.0%**	**0.29**	**3.5%**	**2.33**	**14.4**

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	%	%
SA0006	283	170	0.4	385	1.4	638	868	3.6	3.4
SA0007	693	9	0.7	245	0.4	800	283	4.0	3.3
SA0010	252	208	0.8	291	1.2	502	579	4.3	3.4
SA0013	348	177	0.7	412	1.2	533	631	3.9	3.4
SA0014	293	152	0.7	419	1.4	568	812	4.1	3.4
SA0016	715	213	0.5	630	0.9	690	608	3.8	3.4
SA0021	1,835	2	0.5	647	0.4	551	194	3.2	2.7
SA0024	241	170	0.7	300	1.2	620	772	3.8	3.2
SA0025	1,960	1,080	0.2	550	0.3	582	163	3.7	3.4
SA0026	603	236	0.6	641	1.1	457	486	4.1	3.4
SA0027	466	226	0.4	230	0.5	528	260	3.6	3.4
SA0028	491	244	0.6	566	1.2	635	732	3.0	3.3
SA0029	289	189	0.7	308	1.1	601	640	4.2	3.4
SA0030	253	120	0.5	224	0.9	520	461	4.2	3.3
SA0031	564	342	0.6	636	1.1	551	622	4.3	3.4
SA0033	896	446	0.6	797	0.9	599	532	4.1	3.5
SA0034	148	81	1.1	355	2.4	477	1145	4.7	3.7
SA0035	325	220	0.6	384	1.2	543	641	5.4	3.7
Average	**592**	**238**	**0.6**	**446**	**1.0**	**577**	**579**	**4.0**	**3.4**
Top 25*	**382**	**208**	**0.7**	**453**	**1.4**	**576**	**799**	**4.1**	**3.5**

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
SA0006	2.7	0.7	23%	120	4	63	4	90	57,301
SA0007	0.0	0.0	62%	-	-	-	-	48	38,775
SA0010	4.9	1.4	63%	108	1	26	12	99	49,897
SA0013	5.5	5.1	74%	194	70	111	90	87	46,168
SA0014	9.4	0.3	56%	110	23	87	35	92	52,163
SA0016	4.1	0.6	44%	124	2	6	2	60	41,085
SA0021	0.0	0.0	68%	-	-	-	-	50	27,753
SA0024	6.2	3.1	71%	157	19	21	39	94	58,134
SA0025	0.7	0.0	32%	17	2	32	19	107	62,433
SA0026	5.8	0.0	65%	269	43	-	3	135	61,738
SA0027	2.5	2.3	64%	39	11	35	13	60	31,799
SA0028	4.0	0.1	41%	109	2	16	52	97	61,784
SA0029	2.6	1.9	48%	136	13	11	16	97	58,188
SA0030	5.1	0.2	56%	120	26	95	44	78	40,408
SA0031	4.2	1.8	60%	98	13	34	27	68	37,735
SA0033	7.9	0.6	65%	56	22	51	11	104	62,445
SA0034	17.0	1.7	84%	570	33	125	220	134	64,078
SA0035	4.1	1.0	57%	110	19	69	33	73	39,392
Average	**4.8**	**1.1**	**57%**	**130**	**17**	**43**	**35**	**87**	**49,515**
Top 25*	**7.9**	**1.0**	**55%**	**199**	**19**	**67**	**57**	**103**	**58,835**

*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	of total energy imported
	t DM/hd	$/t DM	$/t DM	$/t DM	$/t DM	$/t DM	% of ME
SA0006	6.46	406	-	320	165	357	77
SA0007	4.60	694	-	318	202	370	38
SA0010	2.84	493	282	302	-	400	37
SA0013	1.58	419	-	265	-	408	26
SA0014	3.28	426	197	326	-	354	44
SA0016	5.10	597	-	391	407	486	56
SA0021	2.43	597	-	401	271	554	32
SA0024	2.08	603	-	-	-	603	29
SA0025	4.96	436	-	360	-	409	68
SA0026	2.40	537	-	271	-	494	35
SA0027	2.53	430	-	-	188	413	36
SA0028	5.24	495	-	348	348	424	59
SA0029	4.67	542	-	324	-	441	52
SA0030	3.18	555	360	344	-	475	44
SA0031	3.04	533	-	426	-	505	40
SA0033	2.60	428	251	291	200	359	35
SA0034	0.93	511	-	221	-	403	16
SA0035	3.05	397	200	300	70	340	43
Average	**3.39**	**505**	**258**	**325**	**231**	**433**	**43**
Top 25*	**3.59**	**463**	**224**	**296**	**183**	**383**	**45**

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
SA0006	0.12	0.15	0.12	0.14	0.08	0.61	0.14	-	0.07
SA0007	0.19	0.11	0.04	0.18	0.18	0.70	0.33	0.56	0.56
SA0010	0.12	0.16	0.01	0.07	0.14	0.50	0.37	0.07	0.07
SA0013	0.08	0.11	0.10	0.14	0.08	0.52	0.70	0.17	0.17
SA0014	0.22	0.18	0.04	0.17	0.19	0.79	0.42	0.06	0.06
SA0016	0.31	0.16	0.17	0.14	0.09	0.87	0.22	0.12	0.12
SA0021	0.19	0.32	0.03	0.27	0.10	0.92	0.85	0.40	0.40
SA0024	0.27	0.22	-	0.18	0.08	0.75	0.62	0.19	0.19
SA0025	0.09	0.12	0.13	0.16	0.06	0.56	0.59	0.07	0.07
SA0026	0.16	0.10	0.11	0.12	0.14	0.62	0.48	0.55	0.55
SA0027	0.12	0.05	0.02	0.15	0.14	0.48	0.42	0.10	0.10
SA0028	0.12	0.17	0.10	0.17	0.14	0.70	0.26	0.27	0.27
SA0029	0.15	0.08	0.02	0.09	0.06	0.41	0.36	0.03	0.03
SA0030	0.23	0.08	0.04	0.19	0.22	0.76	0.59	0.07	0.07
SA0031	0.16	0.13	0.03	0.17	0.08	0.58	0.31	0.08	0.08
SA0033	0.10	0.10	-	0.12	0.04	0.36	0.30	0.10	0.10
SA0034	0.15	0.14	0.08	0.11	0.06	0.55	0.66	0.08	0.08
SA0035	0.20	0.11	0.01	0.07	0.07	0.47	0.43	0.03	0.03
Average	**0.17**	**0.14**	**0.06**	**0.15**	**0.11**	**0.62**	**0.45**	**0.16**	**0.17**
Top 25*	**0.15**	**0.13**	**0.05**	**0.12**	**0.09**	**0.54**	**0.37**	**0.06**	**0.07**

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
SA0006	0.07	0.11	-	1.77	2.02	-	(0.12)	4.06	4.67
SA0007	0.34	0.28	0.38	0.38	1.56	-	0.08	3.92	4.62
SA0010	0.04	0.17	-	0.72	1.44	-	(0.07)	2.73	3.23
SA0013	0.05	0.33	-	0.06	1.22	-	(0.10)	2.81	3.33
SA0014	0.05	0.16	-	0.69	1.75	0.15	(0.40)	3.11	3.91
SA0016	0.14	0.26	-	1.19	2.56	-	(0.22)	4.29	5.16
SA0021	0.37	0.55	-	0.28	2.16	-	(0.09)	4.76	5.68
SA0024	0.08	0.08	-	-	2.02	-	0.12	3.33	4.08
SA0025	0.08	0.12	0.13	1.12	2.36	0.07	-	4.54	5.10
SA0026	0.09	0.33	-	0.16	1.62	-	0.11	3.54	4.16
SA0027	0.19	0.10	-	-	1.99	-	(0.35)	2.45	2.94
SA0028	0.11	0.20	-	1.11	2.39	-	0.01	4.34	5.04
SA0029	0.06	0.14	0.06	1.20	2.33	-	(0.05)	4.12	4.53
SA0030	0.05	0.29	-	0.83	2.11	0.15	(0.09)	4.13	4.90
SA0031	0.08	0.18	-	0.62	2.17	-	-	3.45	4.02
SA0033	0.06	0.47	-	0.53	1.29	-	(0.24)	2.89	3.25
SA0034	0.10	0.10	-	0.16	0.62	0.09	-	2.11	2.66
SA0035	0.08	0.12	-	0.57	1.48	-	(0.03)	2.86	3.32
Average	**0.11**	**0.22**	**0.03**	**0.63**	**1.84**	**0.03**	**(0.08)**	**3.53**	**4.14**
Top 25*	**0.07**	**0.20**	**0.01**	**0.87**	**1.60**	**0.05**	**(0.16)**	**3.26**	**3.80**

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
SA0006	0.03	0.07	0.01	0.18	0.14	0.73	1.16	0.23	0.38	1.77
SA0007	0.07	0.18	0.07	0.55	0.24	0.81	1.93	0.45	1.14	3.52
SA0010	0.08	0.12	0.02	0.32	0.20	0.94	1.68	0.50	0.63	2.81
SA0013	0.05	0.06	0.03	0.37	0.08	0.40	0.98	0.72	1.26	2.96
SA0014	0.04	0.04	0.02	0.21	0.21	0.71	1.22	0.16	0.63	2.01
SA0016	0.04	0.10	0.02	0.33	0.09	1.21	1.79	0.47	0.26	2.52
SA0021	0.06	0.19	0.03	0.78	0.26	2.09	3.41	0.70	0.44	4.55
SA0024	0.05	0.10	0.03	0.29	0.14	0.49	1.10	0.36	0.99	2.45
SA0025	0.06	0.03	0.01	0.39	0.08	1.34	1.91	0.12	0.51	2.54
SA0026	0.05	0.04	0.00	0.39	0.11	0.71	1.31	0.54	0.39	2.24
SA0027	0.14	0.22	0.10	0.16	0.05	2.12	2.80	0.75	0.25	3.80
SA0028	0.03	0.06	0.01	0.19	0.09	1.11	1.50	0.34	-	1.83
SA0029	0.05	0.04	0.02	0.16	0.07	1.09	1.44	0.26	0.33	2.03
SA0030	-	0.10	0.02	0.57	0.25	0.96	1.90	0.15	0.79	2.84
SA0031	0.04	0.05	0.01	0.31	0.22	1.49	2.11	0.20	0.44	2.76
SA0033	0.04	0.05	0.00	0.45	0.03	0.37	0.95	0.28	0.77	2.00
SA0034	0.02	0.08	0.15	0.36	0.17	0.94	1.72	0.19	0.06	1.97
SA0035	0.07	0.12	0.10	0.47	0.10	0.90	1.75	0.53	0.92	3.20
Average	**0.05**	**0.09**	**0.04**	**0.36**	**0.14**	**1.02**	**1.70**	**0.39**	**0.57**	**2.66**
Top 25*	**0.04**	**0.06**	**0.04**	**0.27**	**0.12**	**0.77**	**1.30**	**0.22**	**0.43**	**1.96**

Table A6 Variable costs – percentage

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
SA0006	1.9	2.3	1.9	2.1	1.3	9.4	2.1	0.0	1.1
SA0007	2.3	1.3	0.5	2.2	2.3	8.6	4.1	6.8	6.8
SA0010	2.0	2.7	0.1	1.2	2.3	8.2	6.1	1.2	1.2
SA0013	1.3	1.8	1.6	2.3	1.3	8.2	11.2	2.7	2.7
SA0014	3.7	3.0	0.7	2.9	3.1	13.4	7.1	1.0	1.0
SA0016	4.0	2.1	2.2	1.8	1.1	11.3	2.9	1.6	1.6
SA0021	1.9	3.1	0.3	2.7	1.0	8.9	8.3	3.9	3.9
SA0024	4.2	3.4	0.0	2.8	1.2	11.5	9.4	2.9	2.9
SA0025	1.2	1.6	1.7	2.1	0.7	7.3	7.8	0.9	0.9
SA0026	2.5	1.5	1.7	1.8	2.2	9.7	7.5	8.5	8.5
SA0027	1.8	0.8	0.3	2.3	2.1	7.2	6.2	1.5	1.5
SA0028	1.7	2.5	1.5	2.5	2.1	10.2	3.8	3.9	3.9
SA0029	2.4	1.2	0.4	1.3	0.9	6.2	5.4	0.5	0.5
SA0030	3.0	1.0	0.6	2.4	2.9	9.9	7.7	0.9	0.9
SA0031	2.3	2.0	0.5	2.5	1.2	8.5	4.6	1.2	1.2
SA0033	1.9	1.9	0.0	2.2	0.8	6.9	5.7	1.9	1.9
SA0034	3.2	3.1	1.8	2.4	1.3	11.9	14.2	1.8	1.8
SA0035	3.1	1.7	0.2	1.0	1.1	7.2	6.5	0.5	0.5
Average	**2.5**	**2.1**	**0.9**	**2.1**	**1.6**	**9.1**	**6.7**	**2.3**	**2.4**
Top 25*	**2.6**	**2.3**	**0.9**	**2.2**	**1.5**	**9.5**	**6.9**	**1.1**	**1.3**

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
SA0006	1.1	1.8	0.0	27.5	31.4	0.0	-1.8	63.1	72.6
SA0007	4.2	3.5	4.7	4.7	19.2	0.0	1.0	48.2	56.8
SA0010	0.7	2.8	0.0	12.0	23.8	0.0	-1.2	45.3	53.5
SA0013	0.9	5.3	0.0	0.9	19.4	0.0	-1.5	44.7	52.9
SA0014	0.9	2.7	0.0	11.6	29.6	2.5	-6.8	52.6	66.0
SA0016	1.8	3.4	0.0	15.6	33.4	0.0	-2.8	55.9	67.2
SA0021	3.6	5.4	0.0	2.8	21.1	0.0	-0.9	46.5	55.5
SA0024	1.2	1.2	0.0	0.0	30.9	0.0	1.9	50.9	62.5
SA0025	1.1	1.6	1.7	14.6	31.0	0.9	0.0	59.5	66.8
SA0026	1.4	5.2	0.0	2.5	25.3	0.0	1.7	55.2	65.0
SA0027	2.9	1.5	0.0	0.0	29.5	0.0	-5.2	36.4	43.6
SA0028	1.5	2.9	0.0	16.1	34.8	0.0	0.1	63.1	73.3
SA0029	0.8	2.2	0.9	18.3	35.5	0.0	-0.8	62.9	69.1
SA0030	0.7	3.7	0.0	10.8	27.2	1.9	-1.2	53.4	63.3
SA0031	1.2	2.7	0.0	9.1	32.0	0.0	0.0	50.8	59.3
SA0033	1.2	8.9	0.0	10.2	24.6	0.0	-4.6	55.0	61.9
SA0034	2.1	2.2	0.0	3.4	13.5	1.9	0.0	45.5	57.4
SA0035	1.3	1.9	0.0	8.7	22.7	0.0	-0.5	43.8	51.0
Average	**1.6**	**3.3**	**0.4**	**9.4**	**26.9**	**0.4**	**-1.3**	**51.8**	**61.0**
Top 25*	**1.2**	**3.5**	**0.2**	**14.2**	**26.9**	**0.9**	**-2.8**	**55.8**	**65.4**

Table A7 Overhead costs – percentage

Farm number	Rates	Farm insurance	Motor vehicle expenses	Repairs and maintenance	Other	Employed labour	Total cash	Depreciation	Imputed owner/ operator and family labour	Total
	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs
SA0006	0.4	1.1	0.1	2.8	2.2	11.3	18.0	3.6	5.8	27.4
SA0007	0.9	2.3	0.8	6.8	3.0	10.0	23.8	5.5	14.0	43.2
SA0010	1.3	1.9	0.4	5.3	3.4	15.5	27.8	8.3	10.4	46.5
SA0013	0.7	1.0	0.4	5.8	1.2	6.4	15.6	11.5	20.0	47.1
SA0014	0.6	0.7	0.3	3.5	3.5	12.0	20.6	2.7	10.6	34.0
SA0016	0.6	1.3	0.2	4.4	1.1	15.8	23.3	6.1	3.4	32.8
SA0021	0.6	1.9	0.3	7.7	2.6	20.4	33.3	6.8	4.3	44.5
SA0024	0.7	1.6	0.4	4.4	2.2	7.6	16.8	5.6	15.2	37.5
SA0025	0.8	0.4	0.1	5.1	1.1	17.5	25.0	1.5	6.7	33.2
SA0026	0.8	0.7	0.0	6.1	1.6	11.1	20.4	8.4	6.1	35.0
SA0027	2.1	3.2	1.5	2.4	0.7	31.5	41.5	11.2	3.8	56.4
SA0028	0.5	0.9	0.1	2.8	1.4	16.2	21.8	4.9	0.0	26.7
SA0029	0.8	0.7	0.3	2.5	1.1	16.6	21.9	3.9	5.1	30.9
SA0030	0.0	1.3	0.3	7.4	3.2	12.4	24.5	1.9	10.2	36.7
SA0031	0.5	0.7	0.2	4.6	3.2	21.9	31.2	3.0	6.5	40.7
SA0033	0.8	1.0	0.1	8.6	0.6	7.0	18.1	5.3	14.7	38.1
SA0034	0.5	1.7	3.2	7.8	3.6	20.3	37.1	4.2	1.4	42.6
SA0035	1.1	1.8	1.6	7.2	1.5	13.8	26.9	8.1	14.1	49.0
Average	**0.8**	**1.3**	**0.6**	**5.3**	**2.1**	**14.9**	**24.9**	**5.7**	**8.5**	**39.0**
Top 25*	**0.6**	**1.0**	**0.8**	**5.0**	**2.2**	**13.5**	**23.2**	**3.9**	**7.5**	**34.6**

Table A8 Capital structure

Farm assets				
	Land value	Land value	Permanent water value	Permanent water value
	$/ha	$/cow	$/ha	$/cow
Average	10,474	11,437	3,675	2,792
Top 25%	10,722	7,483	5,187	3,477

Other farm assets (per usable hectare)				
Plant and equipment	Livestock	Hay and grain	Other assets	Total assets
$/ha	$/ha	$/ha	$/ha	$/ha
1,292	2,444	221	198	16,138
1,453	2,973	143	445	18,553

Liabilities	
Liabilities per usable hectare	Liabilities per milking cow
$/ha	$/cow
4,472	4,675
4,704	3,922

Equity	
Equity per usable hectare	Average equity
$/ha	%
11,914	73
14,790	76

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	6.60	6.40	7.25	0.32	0.36	0.28	0.32	2.96	3.35	3.56	4.03
2013/14	6.83	7.53	7.74	8.54	0.30	0.33	0.26	0.29	3.04	3.35	3.61	3.98
2014/15	6.35	6.85	7.03	7.58	0.29	0.31	0.22	0.24	3.28	3.54	3.79	4.09
2015/16	6.15	6.55	7.10	7.56	0.34	0.36	0.24	0.26	3.13	3.33	3.71	3.95
2016/17	5.78	6.04	6.75	7.05	0.40	0.42	0.27	0.28	2.49	2.60	3.16	3.30
2017/18	6.24	6.40	7.08	7.26	0.31	0.32	0.29	0.30	2.80	2.87	3.40	3.49
2018/19	6.46	6.54	7.32	7.42	0.29	0.29	0.24	0.24	3.30	3.34	3.83	3.88
2019/20	7.62	7.62	8.64	8.64	0.36	0.36	0.26	0.26	3.53	3.53	4.14	4.14
Average		**6.77**		**7.66**		**0.35**		**0.27**		**3.24**		**3.86**

	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	1.76	1.60	1.81	3.15	3.57	(0.31)	(0.35)	0.53	0.60	(0.84)	(0.95)	-0.6	-4.9
2013/14	1.54	1.70	1.31	1.45	2.85	3.14	1.27	1.40	0.52	0.57	0.75	0.83	6.2	8.5
2014/15	1.50	1.62	1.03	1.11	2.52	2.72	0.72	0.78	0.55	0.59	0.16	0.17	3.9	3.6
2015/16	1.60	1.70	1.00	1.06	2.60	2.77	0.79	0.84	0.57	0.61	0.22	0.23	3.1	-1.5
2016/17	1.68	1.75	1.04	1.09	2.71	2.83	0.88	0.92	0.47	0.49	0.40	0.42	3.1	2.1
2017/18	1.61	1.65	0.89	0.91	2.50	2.56	1.18	1.21	0.54	0.55	0.65	0.67	4.3	4.1
2018/19	1.50	1.52	0.90	0.91	2.40	2.43	1.09	1.10	0.49	0.50	0.60	0.61	3.5	2.1
2019/20	1.70	1.70	0.95	0.95	2.66	2.66	1.84	1.84	0.46	0.46	1.39	1.39	5.8	7.9
Average		**1.68**		**1.16**		**2.83**		**0.97**		**0.55**		**0.42**	**3.7**	**2.7**

Note: 'Real' dollar values are the nominal values converted to 2017/18 dollar equivalents by the consumer price index (CPI) to allow for inflation.
The gross income in 2017/18 did not include feed inventory changes and changes to the value of carry-over water. These were included in feed costs.

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	0.70	320	1.2	527	622	4.8	1.2	51%	304	344
2013/14	526	164	0.60	453	1.4	469	660	7.9	0.9	57%	343	378
2014/15	529	159	0.70	362	1.3	581	738	-11.5	4.1	44%	364	393
2015/16	447	131	0.70	355	1.4	586	751	6.4	1.4	48%	366	390
2016/17	565	200	0.60	394	1.3	539	630	5.7	1.9	64%	304	318
2017/18	527	205	0.60	399	1.1	569	628	4.4	1.3	54%	340	349
2018/19	573	226	0.63	414	1.1	574	600	5.3	0.9	61%	485	491
2019/20	592	238	0.61	446	1.0	577	579	4.8	1.1	57%	505	505
Average	**512**	**183**	**0.64**	**393**	**1.2**	**553**	**651**	**3.5**	**1.6**	**55%**		**396**

*From 2006/07 to 2010/11 estimated grazed pasture and conserved feed was calculated per usable hectare
From 2011/12 estimated grazed pasture and conserved feed was calculated per hectare of milking area

Appendix B Glossary of terms, abbreviations and standard values

All other income	Income to the farm from all sources except milk. Includes livestock trading profit, 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 100mm 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. 1mm 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 = 1,000kg
Top 25	The state average for the top 25 of farms ranked by return on total assets.

Livestock values

The standard vales used to estimate the inventory values of livestock were as below.

Category	Opening value ($/hd)	Closing value ($/hd)
Mature cows	1,600	1,600
Rising 2 year heifers	1,200	1,600
Rising 1 year heifers	600	1,200
Calves		600
Mature bulls	2,400	2,400

Imputed owner/operator and family labour

In 2019/20 the imputed owner/operator and family labour rate was $32/hr based on a full time equivalent (FTE) working 50 hours/week for 48 weeks of the year. The imputed labour rate was increased from $72,800 in 2017/18 to $76,800 oiin 2019/20.

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