Dairy Australia

DAIRY FARM MONITOR PROJECT

NEW SOUTH WALES ANNUAL REPORT 2018–19

ACKNOWLEDGEMENTS

This project could not happen without the cooperation, patience and goodwill of the farmers who willingly supplied their farm information this year, either for the first time or the eighth consecutive year. NSW DPI gratefully acknowledges their contribution to Dairy Farm Monitor.

The project is conducted by NSW Department of Primary Industries, managed by Kerry Kempton, Technical Specialist Dairy. The success of the project was made possible this year through the contributions of Julie Dart from North Coast Local Land Services; Hayden Kingston from South East Local Land Services; Sheena Carter from Dairy NSW; contractors Tom Farran, Cameron Smith, Tim Burfitt and Andrew Ellem; and Nicolas Lyons and Peter Havrlant, Dairy Development Officers with NSW DPI. These people collected farm data and provided feedback and validation to ensure the accuracy and integrity of the information.

The diligent work of Dairy Australia's consultant analysts Jake Musson and Fiona Smith, who conducted the data checking, validation and analysis, is much appreciated.

This report has been produced by Kerry Kempton, 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
- Statewide overview
- North region overview
- South region 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 each region. 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 2018–19 year. Data are presented for individual farms, as regional financial averages and for the state top 25% of farms ranked by return on total assets (RoTA). The presented averages should not be considered averages for the population of farms in a given region due to the sample not being stratified.

The top 25% consists of eight farms on a statewide basis, taken by considering all 32 as the one sample and not from combining the top farms from each region. Return on total assets is the indicator used to identify the top 25% of producers as it provides an assessment of the performance of the whole farm irrespective of differences in location and production system.

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

Given the differences in variation in the regional data, one region should not be compared to another.

This report often refers to the group of participating farms in a given region by their regional name;

- The 17 participating farms in the Northern NSW region are referred to as 'North'.
- The 15 participating farms in the Southern NSW region are referred to as 'South'.

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

Milk production data is presented in kilograms of milk solids as most 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 cents per litre, 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 *Dairy Farm Monitor Project* report 2017–18. Price and cost comparisons between years are nominal unless otherwise stated. It should be noted that not all of the participants from 2017–18 are in the 2018–19 report, as there were new farms in this year's dataset. It is important to bear this in mind when comparing datasets between years. Reference is made at the start of each regional chapter on which farms are new to the project.

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

WHAT'S NEW IN 2018–19?

The Dairy Farm Monitor Report for 2018–19 includes a couple of minor changes since last year's report.

- Fertiliser application rates are now reported on the milking area as compared with the usable area in previous years.
- Average data do not include zero values for the indicators given below. A note to this effect is also given in the Appendix Tables.
  - Silage, hay and other feed values ($/t)
  - Land values
  - Water asset values
  - Equity values

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

SUMMARY

In 2018–19 data collected and analysed from 32 farms across New South Wales revealed that farm business profit again decreased, to the lowest level in the eight year life of the project.

Although milk prices increased by 6%, feed costs increased by 15% on average, due mainly to the impact of the widespread drought in NSW. Rainfall was again below average across all regions of NSW, and summer again delivered record high temperatures, making it another very difficult season for NSW dairy farmers.

Due to the challenging operating environment in 2018–19, state milk production decreased by 5.6% over the year to 1.08 billion litres (Source: Dairy Australia).

For the farmers participating in the Dairy Farm Monitor Project (DFMP), milk price in 2018–19 increased on average by 6.5% on the previous year, up from $7.27 to $7.74 kg/MS (57¢/litre).

NSW began the 2018–19 year with 100% of the state in drought, and ended the year in a similar situation. Some regions, particularly on the coastal and southern areas, received some good falls of rain at different periods of the year. This provided some good pasture and crop growth in those areas, but rainfall was still below historical averages, with often no follow up rain to prolong fodder production.

Those dairy farms with irrigation have been able to mitigate the effects of the drought to some extent, however many river systems are at critically low flows and irrigation has been curtailed or restricted to ground water only in many catchments.

Farmers made the most of the available rain and irrigation water, and this year sourced 60% of their feed requirements from home grown crops and pastures. However, it cost them more to do it, through higher water, fuel, electricity, fertiliser and fodder conservation costs.

Purchased grain and fodder remained in tight supply, which saw prices per tonne continue to rise to record levels in the history of the project. The average cost of concentrates was $567/t DM, and the average cost of hay was $439/t DM.

Average Earnings Before Interest and Tax (EBIT) per farm decreased to $53,372 compared to $84,329 in 2017–18; although EBIT increased by a small amount on a milk solids sold basis. The average earnings before interest and tax (EBIT) was $0.38 kg/MS (2.6 c/l).

NSW dairy farmers were able to access drought support payments from various sources. Those included in this analysis were freight rebates on transport of fodder, and payments from the major liquid milk retailers from sales of milk.

Whilst this year there was a decline in farm profit across the state, there was a notable difference in profit between the farms in the two regions.

The North

Farmers in the North improved profit this year, despite the ongoing drought. Milk prices on average increased by 6% to $8.07 kg/MS (58.6 c/l), and other farm income increased as well.

The average cost of production (including inventory change) was 3.5% higher than the year before, at $8.67 kg/MS (63 c/l). This was mainly due to higher purchased and home grown feed costs.

Average whole farm earnings before interest and tax (EBIT) increased to $87,175 per farm, compared to $39,802 in 2017–18. Average return on total assets increased from 0.5% in 2017–18 to 1.1% in 2018–19.

The South

Most of the southern region also experienced lower than average rainfall throughout 2018–19, although they had close to average rainfall at times during the year.

Whilst milk prices increased by 8% over the previous year to $7.37 kg/MS, the average cost of production increased by 16.5% in 2018–19, to $7.97 kg/MS (60 c/l), mainly due to higher prices for purchased and home grown feed.

Overall this led to a large decrease in EBIT to an average of $15,061 per farm this year, down from $141,549 the previous year. Average return on total assets for the group decreased to 0.3%, down from 2.1% in 2017–18.

Farmer confidence

Considering 2018–19 was another year of lower profits, expectations about improving business profit for the coming season were generally positive, with 80% of farmers expecting an improvement or at least no change, and only 20% expecting a deterioration.

Intentions for increasing milk production next year were neutral in the North at 47%, and negative in the South at 21%, indicating the uncertainty in farmer confidence about the year ahead, given the continuing drought.

The major concerns facing participants for 2018–19 were related to seasonal conditions and input costs, and the subsequent issues in managing feed supply. Most were concerned about the impact of the drought on their business viability, both in the short and medium term outlook.

Historical analysis

A historical analysis over the past eight years of the project showed that 2018–19 continued the trend of the previous three years with lower EBIT per farm and diminishing return on total assets and equity.

FARM MONITOR METHOD

This chapter explains the method used in the Dairy Farm Monitor Project and defines the key terms used. The performance of dairying businesses is generated using whole farm analysis principles and is consistent with Dairy Australia's DairyBase.

The DFMP provides the dairy industry and government with objective, farm-level information for targeted strategy and decision making. The method was adapted from *The Farming Game* (Malcolm *et al*. 2005) and is consistent and comparable with previous DFMP analyses and reports, and also with DairyBase.

DairyBase is a national dairy database that enables dairy farmers to measure and compare farm business performance over time. The database stores farm-level data generated from the DFMP and publishes aggregated data from a minimum of six other farms. The standardised database provides the dairy industry with a consistent method and terms for farm financial reporting.

The DFMP method is presented as a profit map in Figure 1, which shows how the different measures are calculated. The performance of all project participants in 2018–19 is also shown.

The diagram illustrates the profit measures as costs deducted from gross farm income. Growth in profit 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 maximising the margin between income and costs, or cost efficiency relative to income generation.

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 of farm income.

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 from gross farm income, gives the gross margin. Gross margins are often used to compare between similar enterprises and are commonly used in broad acre cropping and livestock enterprises. Gross margins are not generally used in the economic analysis of dairy farming businesses due to the specific infrastructure investment required to operate a dairy farm, making it less desirable or feasible 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 paid labour, rates, insurance, and repairs and maintenance. Non-cash overheads include costs that are not actual cash receipts or expenditure; for example depreciation on plant and 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

Gross farm income minus variable and overhead costs is EBIT. It is the return from all 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 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.

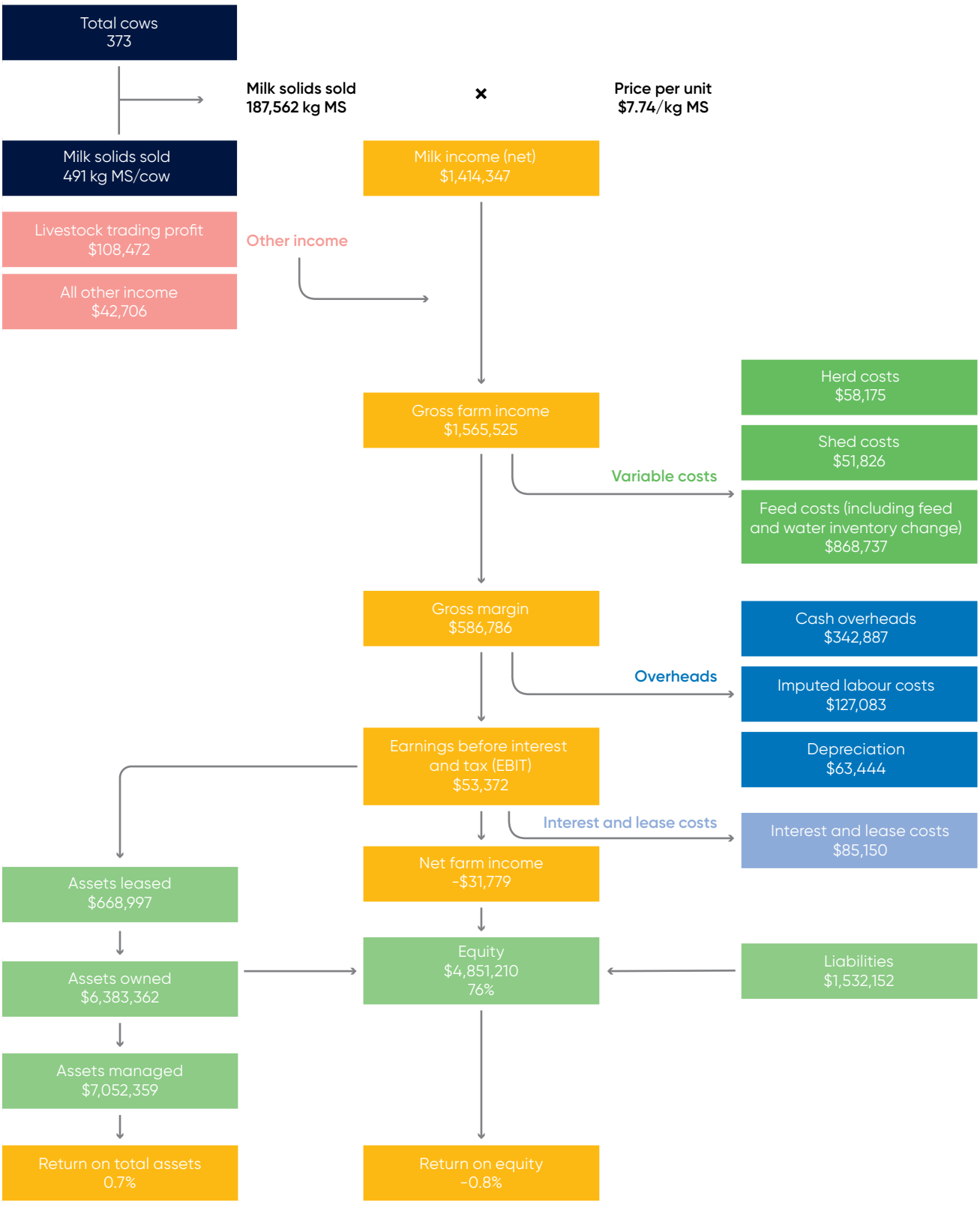
Return on total assets indicates the overall earning of the total farm assets, irrespective of capital structure of the business. It is EBIT expressed as a percentage of the total assets under management in the farm business, including the value of leased assets.

A measure of the owner's rate of return on their own capital investment in the business is RoE. It is net farm income expressed as a percentage of total equity (one's own capital).

The equity percent of total capital or debt: equity ratio varies depending on the individual farm business and farm owner's attitude towards risk.

Further RoTA from any increase in the value of assets over the year, such as capital appreciation, is not considered in the DFMP method. If land value increases 5% over the year, this is added to the return from farming to give total return to the investment. This RoTA can be compared with the performance of alternative investments with similar risk in the economy.

Figure 1 Dairy Farm Monitor Project method profit map – state average 2018–19 data, 32 farms



Statewide overview

This section of the report presents the average performance and the range of physical and financial indicators for all participant farms across New South Wales from the North and South regions.

NSW produces 12% of Australia's national milk supply, a total of 1.08 billion litres in 2018–19 from 600 dairy farms. Around 65% of NSW milk produced is supplied to the domestic liquid milk market, with the remainder processed for the domestic and export markets. The NSW dairy industry is spread along the coastal and hinterland regions and in irrigated inland river valleys.

The approximate location of the farms participating in the DFMP are shown in Figure 2.

Farms in the North region range in location from the Queensland border to the Hunter Valley along the coast and hinterland. They are generally characterised as having moderate to high rainfall, limited irrigation, a kikuyu/annual ryegrass pasture base with some use of summer forage crops.

The South group includes farms along the coast from Sydney to Bega, and farms from the inland river systems of NSW, including the Central West, Tamworth and Riverina regions. They are generally characterised by lower rainfall, mainly irrigated perennial and annual pastures, greater use of forage crops, larger herds and bigger farms.

Whilst this grouping reflects general similarities among farm systems and the influences on milk pricing across NSW, there is a wide range of farm characteristics within each group.

Seasonal conditions

NSW began the 2018–19 year with 100% of the state in drought, and ended the year in a similar situation. Rainfall for the year was again well below average, particularly in the northern half of the state, which experienced intense drought all year.

Some regions, particularly on the coastal and southern areas, received some good falls of rain at different periods of the year. This provided some good pasture and crop growth in isolated areas, but rainfall was still below historical averages, with often no follow up rain to prolong fodder production.

Widespread rainfall in early May was timely for sowing winter crops across many regions, but dry conditions over winter are expected to limit the grain harvest in NSW.

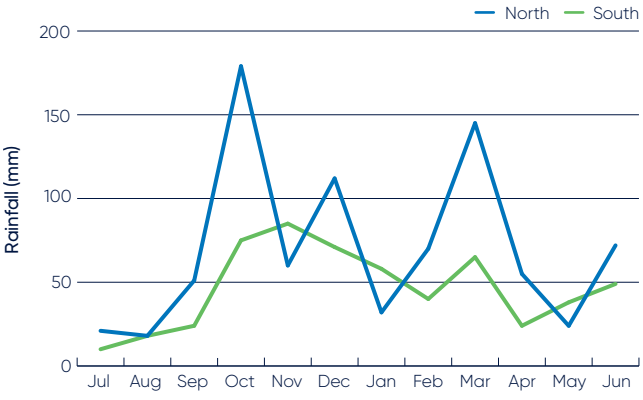
Extreme heat was experienced across NSW in January, with 90% of the state having the warmest January in history. This placed further pressure on summer crops and water storages.

Those dairy farms with irrigation have been able to mitigate the effects of the drought to some extent, however many river systems are at critically low flows and irrigation has been curtailed or restricted to ground water only in many catchments.

The regional sections provide more detail on the 2018–19 seasonal conditions. Figure 3 shows the average monthly rainfall pattern in 2018–19 for the participating farms, and the differences between the regions.

Figure 2 Distribution of participant farms in 2018–19

Figure 3 2018–19 monthly rainfall



WHOLE FARM ANALYSIS

2018–19 was again a challenging year for participant farms in NSW due to the ongoing dry conditions experienced for most of the year. Farmers have made the most of the available rainfall and irrigation water, with an increase in the percentage of home grown feed in the diet.

There were seven new farms in the project this year (three in the North and four in the South), and there were seven who chose not to participate, to leave the sample size at 32 farms (17 in the North and 15 in the South groups).

Participant farms in the South had larger herd size, farm size and higher milk solids per cow and per labour unit than the North farms.

Average herd size increased across both regions this year to 373 cows, up from an average of 337 cows last year, and was influenced by the change in sample farms.

The average rainfall across the state was slightly lower than the previous year, particularly for the South farms which experienced 20% reduction in average rainfall.

Milk solids (MS) sold per cow was lower in the North, down from 459 to 443kg per cow. However it was higher in the South, up by 20kg to 546kg per cow.

Labour efficiency in kilogram of milk solids produced per full time equivalent person remained stable on both North and South farms.

The percentage of home grown feed in the diet increased from 56 to 60% this year, with the larger increase in the North farms where 64% of the diet was homegrown.

Table 1 presents the average of some farm characteristics for the state and for each region. Further details can be found in the Appendix Table 2 for each region.

Gross farm income

Gross farm income includes all farm income from milk sales, livestock trading and income from other sources such as milk company share dividends or farmhouse rental.

Net milk income increased this year due to a 6.4% increase in milk price. The average milk price across all participants was $7.74 kg/MS (57 ¢/litre), up from $7.27 kg/MS last year. Average milk price in the North this year was $8.07 kg/MS (58.6 c/l) and in the South it was $7.37 kg/MS (54.9 c/l).

Milk income accounted for 89% of gross farm income, with income from livestock trading profit higher at $0.66 kg/MS in 2018–19, compared to $0.62 kg/MS in the previous year. Other income was higher this year at $0.28 kg/MS (2.0c/l), and included income passed on to dairy farmers from various drought support measures implemented by the major fresh milk retailers and processors.

Table 1 Farm physical data – state overview

Farm physical parameters	Statewide	North	South
Number of farms in sample	32	17	15
Annual rainfall 18–19 (mm)	706	838	556
Herd size	373	328	424
Total water use efficiency (t DM/100mm/ha)	0.7	0.7	0.8
Total usable area (ha)	342	299	390
Milking cows per usable hectares	1.3	1.3	1.2
Milk sold (kg MS/cow)	491	443	546
Milk sold (kg MS/ha)	610	580	643
Home grown feed as a % of ME consumed	60	64	56
Labour efficiency (cow/FTE)	77	72	83
Labour efficiency (kg MS/FTE)	37,908	31,993	44,612

Variable costs

Variable costs are those costs that vary with the size of production in the enterprise, and include herd, shed and feed costs (including feed and water inventory change). Table 2 shows the largest cost category was purchased feed and agistment, at $2.99 kg/MS (21.9 c/l), which is 12% higher than the previous year ($2.66 kg/MS). This is a continued effect of the drought, with another year of higher cost per tonne of concentrates and fodder. Home grown feed costs were also higher this year, up from $1.23 to $1.55 per kg/MS. The combined effect was the main factor causing increased costs in both regions.

Total feed costs, including home grown feed, purchased feed and agistment and feed and water inventory change, were up significantly at $4.49 kg/MS, compared to $3.89 kg/MS, and accounted for 54% of total costs (variable plus overhead costs) on average for the state. This was the highest feed cost in the eight years of the project.

See Appendix Table 6 for a breakdown of variable costs as a percentage of total costs in each region.

The gross margin is equal to gross farm income minus total variable costs. While commonly used to compare enterprises that have a similar capital structure like sheep or beef, it can be a useful measure in dairy to analyse changes on farm that do not require capital investment. The statewide average gross margin was $3.57 kg/MS, which was higher than the previous year ($3.46 kg/MS).

Overhead costs

Overhead costs are the costs incurred by the farm business that are not directly related to the size or 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.

Average total overhead costs this year were similar to last year, at $3.19 kg/MS (23 c/l).

Table 2 shows that in 2018–19 the North had higher average variable costs as well as higher average overhead costs on a per kilogram of milk solids basis compared to the South.

Earnings before interest and tax

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

Average EBIT was higher across the state this year on a milk solids basis, at $0.38 kg/MS (2.6 c/l) compared to $0.33 kg/MS (2.5 c/l) in 2017–18. However on dollars per farm basis EBIT was lower this year, at an average of $53,000 per farm, compared to $85,000 per farm in the previous year.

Whilst the state average shows a small improvement, the two regions fared differently. There was a significant increase in EBIT in the North region, up from $0.13 kg/MS to $0.43 kg/MS. However, participant farms in the South had a significant decrease in EBIT, down from $0.58 kg/MS to $0.31 kg/MS.

This relatively low EBIT across the regions, despite a 6.5% increase in milk price, reflects the increase in costs due to the adverse seasonal conditions and the challenges in managing feed supplies.

Figures 16 and 26 in the regional sections present the EBIT of participant farms this year.

Return on total assets and equity

The return on total assets (RoTA), including owned and leased assets is calculated as EBIT divided by total assets under management.

There was a decrease in the average RoTA for participants across the state in 2018–19. The RoTA was 0.7%, down from 1.2% last year.

Figure 5 shows the majority of farms had a RoTA between 0% and 5%. The participant farms ranged from negative 8.6% to 5.0%, with 22 of the 32 farms recording a positive RoTA.

A measure of the owner's rate of return on their own capital investment in the business is Return on Equity (RoE).

The average RoE for the 32 farms was negative 0.8%, a decrease from the -0.3% RoE received by participants last year. The range in RoE for the State was negative 21% to 8.6% this year, with only 16 of the 32 farms recording a positive RoE (Figure 6).

Table 2 Average farm financial performance per of kilogram milk solids and cents per litre – statewide

Farm income and cost category	Statewide		North		South	
Income	**$ kg/MS**	**c/l**	**$ kg/MS**	**c/l**	**$ kg/MS**	**c/l**
Milk income (net)	7.74	56.9	8.07	58.6	7.37	54.9
Livestock trading profit	0.66	4.7	0.70	5.1	0.61	4.4
Other farm income	0.28	2.0	0.38	2.7	0.17	1.2
Total income	8.68	63.6	9.16	66.4	8.14	60.4
Variable costs						
Herd cost	0.31	2.3	0.33	2.4	0.30	2.2
Shed cost	0.31	2.3	0.35	2.5	0.26	1.9
Home grown feed cost	1.55	11.5	1.62	11.8	1.48	11.2
Purchased feed and agistment	2.99	21.9	2.93	21.2	3.06	22.6
Feed inventory change	-0.09	-0.5	-0.09	-0.6	-0.08	-0.4
Water inventory change	0.03	0.2	0.00	0.0	0.07	0.6
Total feed costs	4.49	33.2	4.45	32.4	4.54	34.0
Total variable costs	5.11	37.7	5.13	37.3	5.10	38.2
Gross margin	**3.57**	**25.9**	**4.03**	**29.1**	**3.05**	**22.2**
Overhead costs						
Employed labour	1.03	7.5	1.20	8.7	0.83	6.2
Repairs and maintenance	0.44	3.3	0.50	3.6	0.38	2.8
All other overheads	0.41	2.9	0.46	3.3	0.34	2.5
Imputed labour	0.94	6.8	1.03	7.4	0.84	6.1
Depreciation	0.38	2.8	0.40	2.9	0.35	2.6
Total overhead costs	3.19	23.3	3.59	26.0	2.74	20.3
Variable and overhead costs	**8.31**	**61.0**	**8.72**	**63.3**	**7.84**	**58.4**
Earnings before interest and tax	**0.38**	**2.6**	**0.43**	**3.1**	**0.31**	**2.0**

Table 3 Risk indicators – statewide and by region

	Statewide	North	South
Cost structure (percentage of total costs as variable costs)	62	59	65
Debt service ratio (percentage of income as finance costs)	6	5	7
Debt per cow	$4,735	$3,590	$6,033
Equity percentage (ownership of total assets managed)	76	81	70
Percentage of feed imported (as a percentage of total ME)	40	36	44

Further discussion of RoTA and RoE occur in the risk section below and later in the regional chapters. Appendix Table 1 presents RoTA and RoE for the participant farms for each region.

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]

As most farms use a mix of borrowed and owned capital, they are generally exposed to both business and financial risk. It is important to understand that risk drives return, and achieving the right balance between risk and return can drive success.

Table 3 presents some key risk indicators. Refer to Appendix D for the definition of terms used in Table 3. The indicators in Table 3 can also be found in Appendix Table A1 for the state and in Appendix Tables, B1 and C1 for each region.

The cost structure ratio provides variable costs as a percentage 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, $0.62 was used to cover variable costs, a small increase from last year ($0.59). However it is worth noting that cost structure varies between regions and farms.

The debt service ratio shows interest and lease costs, as a percentage of gross farm income. The ratio of 6% this year is the same as last year. It indicates that on average farms repaid $0.06 of every dollar of gross farm income to their creditors. Average debt per cow increased on last year.

This year there was a decrease in average equity levels across the state, with an average of 76% compared to 77% last year. Caution should be exercised when comparing equity between years as the farm sample changes.

Figure 4 Average earnings before interest and tax

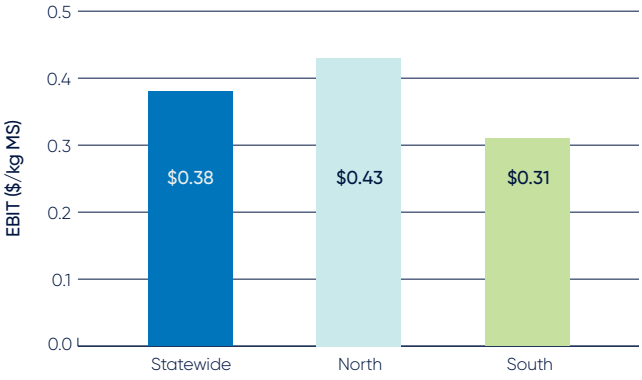


Figure 5 Distribution of farms by return on total assets

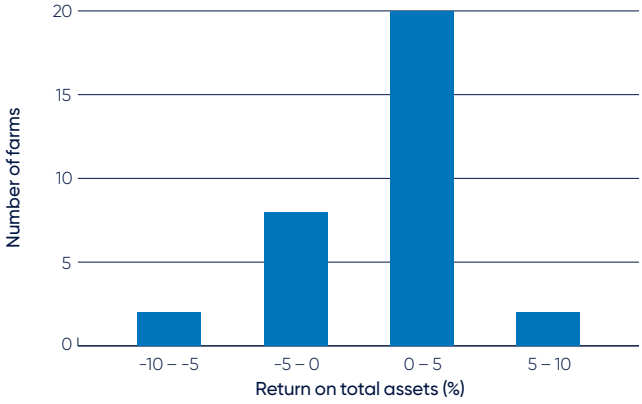
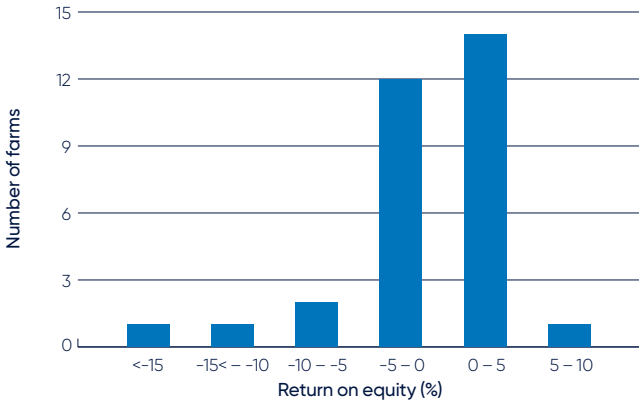


Figure 6 Distribution of farms by return on equity



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

Feed consumption

The contribution of different feed sources to the total ME consumed on the farm is presented in Figure 7. This includes feed consumed by dry cows and young stock.

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

On the North farms grazed pasture made up 53% of the diet for cows and concentrates 31%. This represents more pasture and less concentrate than the previous year.

On the South farms grazed pasture made up 36% of the diet, with a similar percentage of 36% of the diet coming from concentrates. South farms sourced 27% of the diet from hay and silage, whilst North farms sourced 15% of ME from hay and silage.

These figures indicate that pasture production was higher in the North farms, with the shortfall in ME sourced from conserved fodder rather than extra concentrates.

Appendix Table 3 provides further information on purchased feed.

Figure 8 and Appendix Table 2 provide estimates of the average quantity of home grown feed consumed per milking hectare of sample 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.

Estimated home grown feed consumed was calculated based on the total ME required on the farm, determined by stock numbers on the farm, liveweight, average distance stock walked to and from the dairy and milk production. Metabolisable energy imported from other feed sources is subtracted from the total farm ME requirements over the year, to give estimated total ME produced on farm. The ME produced on farm is divided into grazed and conserved feed, using records of the amount of conserved fodder produced.

Total home grown feed consumed on the milking area (by direct grazing plus conservation) in 2018–19 was similar to the previous year, but varied across the regions.

The North directly grazed 7.2 t DM/ha, and conserved 1.6 t DM/ha, for a total of 8.8 t DM/ha, up by 0.6 t DM/ha. The South consumed an average of 5.3 t DM/ha of direct grazed pasture and conserved 1.1 t DM/ha, for a total of 6.3 t DM/ha, down by 0.3 t DM/ha.

Several of the farms in the project grew fodder crops for silage or grain on the non-milking area. These tonnages were calculated as part of the total feed produced on the farm usable area, but may not be captured as home grown feed consumed on the milking area. So some farms may appear as low consumers of pasture by direct grazing, but may actually grow and consume large tonnages of fodder over the whole farm usable area.

Figure 7 Sources of whole farm metabolisable energy

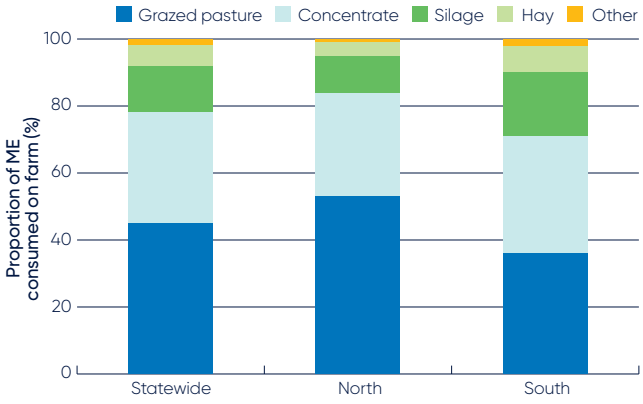
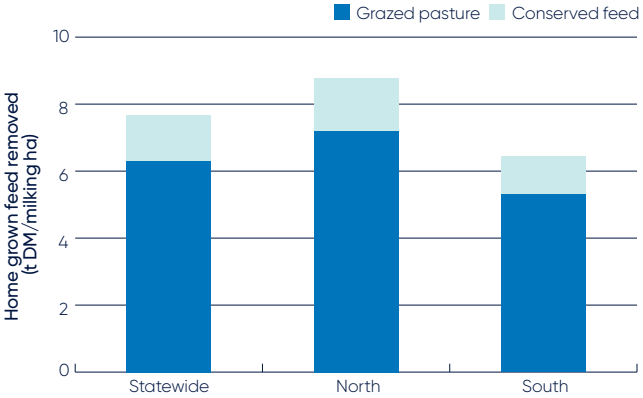


Figure 8 Estimated tonnes of homegrown feed consumed



Fertiliser application

Application of nutrients for the state and each region is shown in Figure 9. This is now reported for the milking area rather than for the whole usable area of each farm, as in previous years.

Across the state, the total application of nutrients on the milking area was 182kg/ha. This comprised of nitrogen (126kg/ha), phosphorus (17kg/ha), potassium (25kg/ha) and sulphur (14kg/ha). There was significant difference between the regions, average fertiliser usage on the milking area for the North was: nitrogen at 151kg/ha, phosphorus 19kg/ha, potassium at 36kg/ha, and sulphur at 21kg/ha. For the South it was: nitrogen at 96kg/ha, phosphorus at 13kg/ha, potassium at 12kg/ha and sulphur at 7kg/ha.

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

Appendix Table 2 provides further information on fertiliser application for each region.

Milk production

Figure 10 shows the average monthly distribution of milk sold across both regions of NSW, and reflects the flatter milk supply required by processors for the liquid milk market. While production is very similar for most of the year it can be seen that the North farms in 2018–19 had a drop in production in autumn relative to the South, reflective of the hot and dry conditions for farms in that region.

Calving pattern

The calving pattern for each region is shown in Figure 11, and reflects that most NSW farms calve cows all year round.

The South farms this year showed a peak calving period in spring and another smaller peak in autumn. The North farms showed an autumn peak calving period.

The lowest calving period occurs throughout the hotter summer months in both regions.

Figure 9 Nutrient application per milking hectare

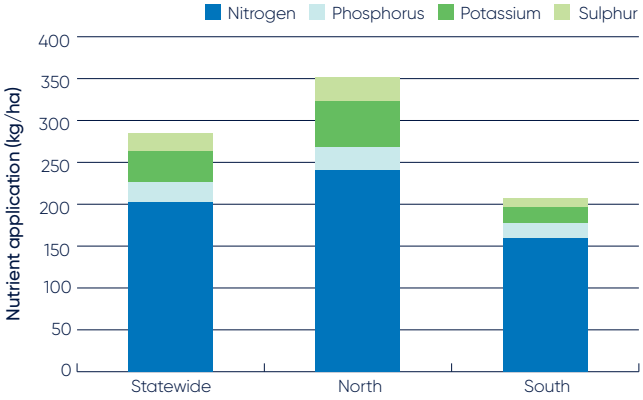


Figure 10 Monthly distribution of milk solids sold

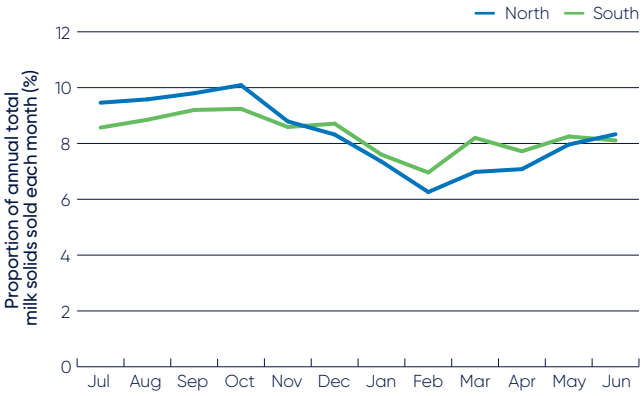
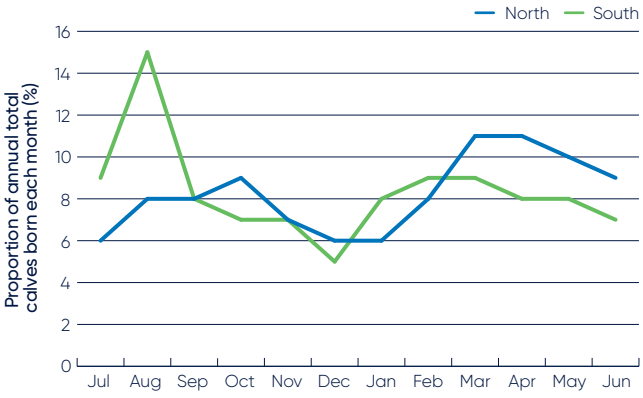
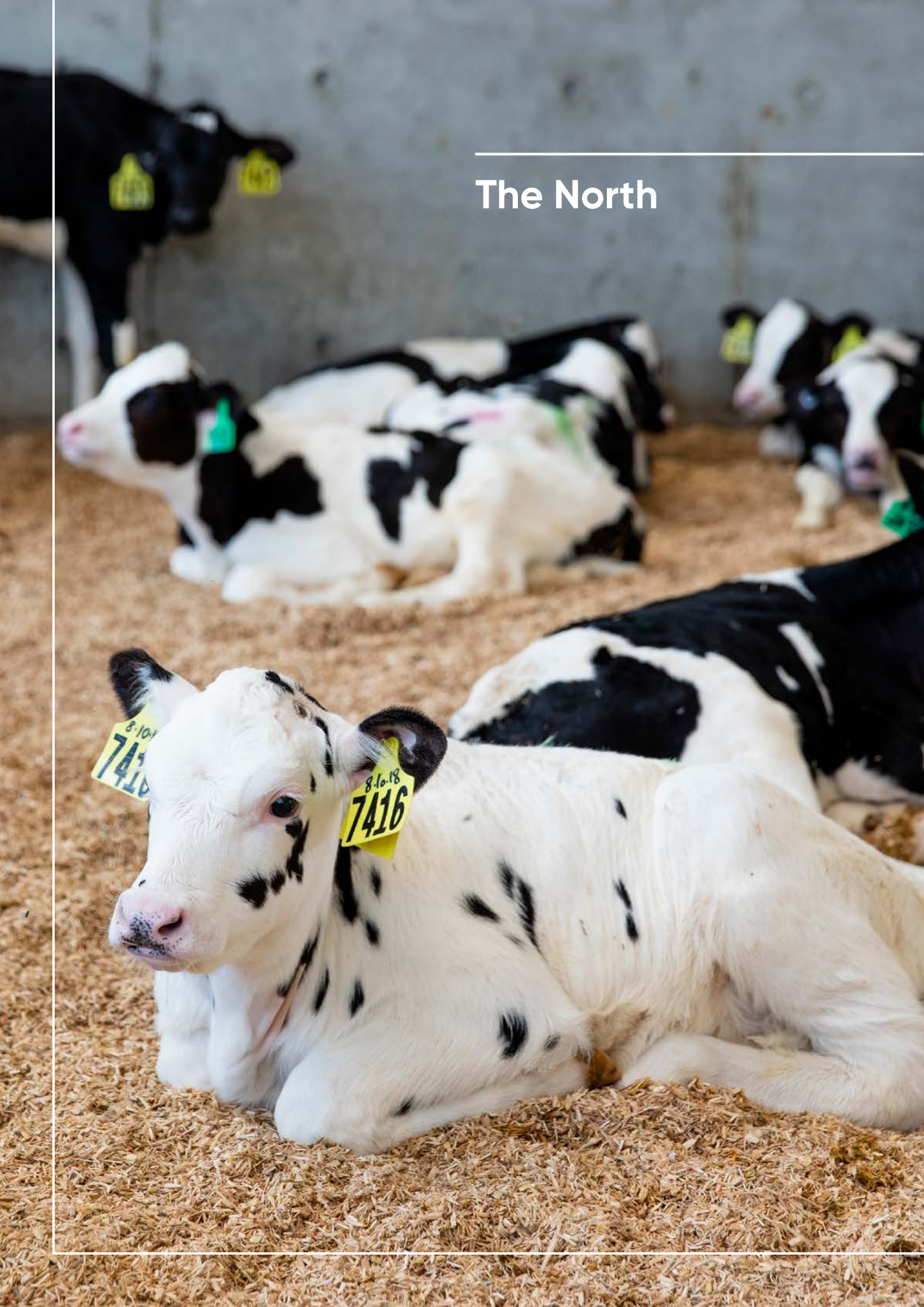


Figure 11 Monthly distribution of calves born



The North



There were three new farms in the North dataset this year, and four farms from last year did not participate.

The dry conditions continued throughout northern NSW for much of 2018–19, with drought or severe drought covering much of the northern half of the state. There were some months where close to average rainfall was received, but these provided only a brief respite from the prevailing drought.

All North farms received below average long term rainfall (Figure 12). Average rainfall for the Northern dataset dropped to 838mm in 2018–19, down from 864mm in the previous year.

Whole farm analysis

Participant dairy farmers in the North received an average milk price of $8.07 kg/MS sold this year, up from $7.62 kg/MS in the previous year.

Whilst average herd size for the North farms increased to 299 cows, both milk solids production per cow and per hectare were lower this year. The average home grown feed as a percentage of ME consumed was higher at 64%, compared to 57% in the previous year. Stocking rate was also lower on average, at 1.3 cows/usable hectare.

Lower stocking rate and higher purchased feed prices, combined with limited rainfall meant that farmers were focussed on making the most of whatever pasture and fodder they could grow. Home grown feed consumed per hectare was also higher in the North.

Grain and fodder prices increased during 2019 and supply for hay continued to be tight. The NSW government provided drought rebates on transport for fodder and livestock, and although this was capped, it did help to reduce the landed cost of purchased feed.

Labour efficiency was similar to the previous year.

Key whole farm physical parameters for the North are presented below in Table 4. The Q1 – Q3 range shows the band in which the middle 50% of farms for each parameter sit.

As explained on page 4 of this report, the top 25% shown are across all farms in the state, not for each region, due to the sample size.

Milk solids sold

Average milk solids sold per hectare decreased this year to 580kg MS/ha (8000 litres/ha). Average milk solids sold per cow were also lower than last year, at 443kg MS/cow (6,113 l/cow).

Figure 13 shows the kilograms of milk solids sold per usable hectare and per cow for each farm.

Gross farm income

Gross farm income includes milk sales net of levies and charges, livestock trading profit and other farm income.

The average gross farm income of $9.16 kg/MS (6 c/l) included milk income of $8.07 kg/MS (58c/l) plus all other income associated with the dairy business operation of $1.09 kg/MS (8c/l).

This year's average gross farm income was 9% higher than last year's average. The milk price received was up 5.9%, livestock income was up a little, and other farm income increased significantly. Other farm income includes drought support payments raised through campaigns from the major retailers on the sales of liquid milk.

Figure 14 shows the gross farm income for each farm.

Variable costs

Variable costs (shown as light blue bars in Figure 15) are 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).

Table 4 Farm physical data – North

Farm physical parameters	North average	Q1 to Q3 range	State top 25% average
Annual rainfall 18–19 (mm)	838	672–866	810
Herd size	328	207–400	458
Total water use efficiency (t DM/100mm/ha)	0.7	0.6–0.8	1.0
Total usable area (hectares)	299	177–277	318
Milking cows per usable hectares	1.3	1.1–1.7	1.5
Milk sold (kg MS/cow)	443	408–486	524
Milk sold (kg MS/ha)	580	435–749	748
Home grown feed as percentage of ME consumed	64	58–70	65
Labour efficiency (milking cows/FTE)	72	65–78	80
Labour efficiency (kg MS/FTE)	31,993	28,045–36,429	40,299

The average total variable cost was $5.13 kg/MS (37.3 c/l) with a range of $4.12 to $6.53/ kg/MS for participant farms in the North. This is 7% higher than in 2017–18 due largely to an increase in feed costs, both purchased and home grown feed. Herd and shed costs were similar to last year at $0.33 kg/MS and $0.35 kg/MS, respectively.

Feed costs were the most significant variable cost items, accounting for more than 50% of the average total costs in 2018–19. The average feed cost was $4.45 kg/MS, which is 8.8% higher than last year's cost of $4.09 kg/MS. On average, feed inventory change was negligible, as farmers had little conserved feed on hand at the start of the year and were unable to make enough to carry over at the end of the year.

The average cost of home-grown feed was higher than the previous year at $1.62kg MS, affected by costs of fertiliser, fuel, fodder conservation and irrigation.

Purchased feed and agistment costs were $2.93 kg/MS, which is 6% higher than the previous year

The average cost of concentrates in the North this year was $580/t DM ($520/t as fed), up from $442/t DM last year. The cost of concentrate includes the cost of additives and minerals. North farmers fed an average of 1.8 t DM/head concentrates to the milkers, although this figure includes concentrates fed to young stock on the milking area.

The average cost of purchased hay was significantly higher this year at $487/t DM, ($414 /t as fed), as supplies of hay became scarce and difficult to source.

Figure 15 shows the breakdown of total farm costs as variable and overhead costs per kg MS. A breakdown of variable costs for the individual businesses on a dollar per kilogram of milk solids sold basis is shown in Appendix Table B4.

Overhead costs

Overhead costs are those that do not vary greatly with the level of production. These include cash overheads such as employed labour, rates and insurance as well as non-cash costs such as imputed owner operator and family labour and depreciation of plant and equipment.

The average overhead costs for 2018–19 at $3.59 kg/MS (25.6 c/l) were only slightly higher than the previous year.

The overhead costs this year ranged from $2.36 kg/MS to $4.68 kg/MS (shown as dark blue bars in Figure 15).

Farms that regularly perform well do so by keeping overhead costs per kg MS low and managing variable costs according to the season.

The main overhead cost category is labour, both employed and imputed, which account for 60% of the total. This year labour costs were similar to the previous year.

The percentage breakdown of the individual totals are presented in Appendix Table B6.

Figure 12 Annual rainfall and long term average rainfall

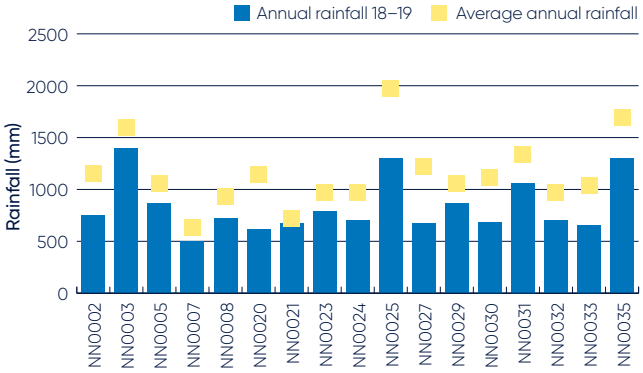


Figure 13 Milk solids sold per usable hectare

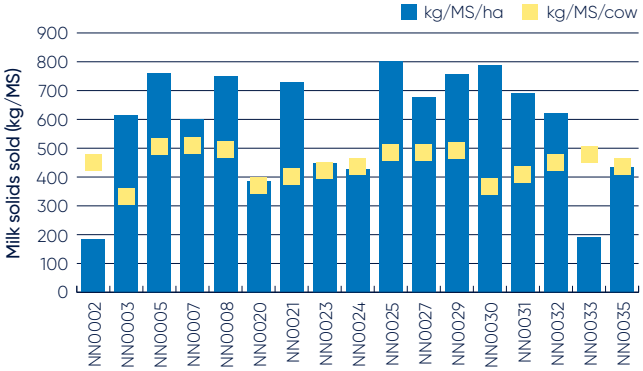


Figure 14 Gross farm income per kilogram of milk solids

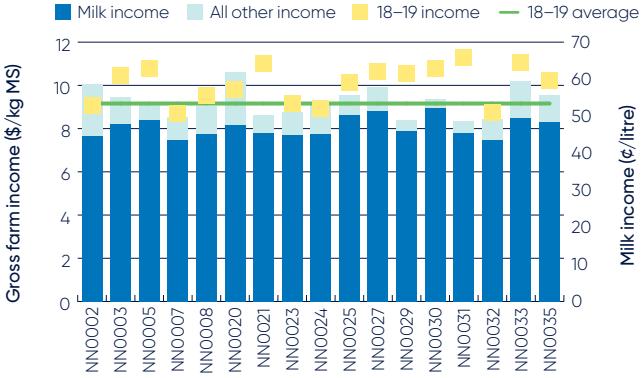


Figure 15 Whole farm variable and overhead costs

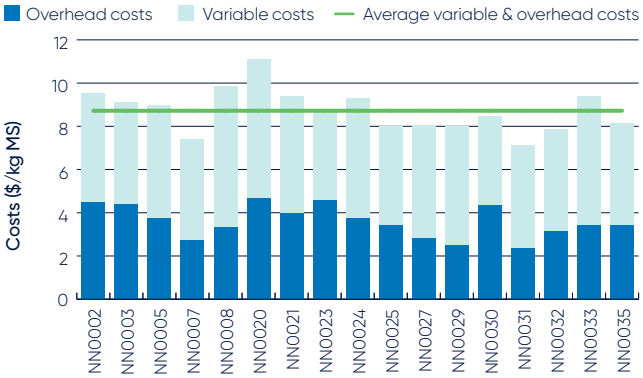


Table 5 Average farm financial performance – northern NSW

Farm income and cost category	Statewide		Q1 to Q3 range	State top 25% average	
Income	**$ kg/MS**	**c/l**	**$ kg/MS**	**$ kg/MS**	**c/l**
Milk income (net)	8.07	58.6	7.42–7.74	7.99	57.1
Livestock trading profit	0.70	5.1	0.41–0.80	0.68	4.8
Other farm income	0.38	2.7	0.01–0.24	0.17	2.2
Total income	9.16	66.4	8.06–8.8	8.99	64.2
Variable costs					
Herd cost	0.33	2.4	0.32–0.43	0.40	2.9
Shed cost	0.35	2.5	0.26–0.39	0.34	2.4
Home grown feed cost	1.62	11.8	1.17–1.54	1.52	10.8
Purchased feed and agistment	2.93	21.2	2.24–3.05	2.48	17.7
Feed inventory change	-0.09	-0.6	-0.15–0.13	-0.29	-2.0
Water inventory change	0.00	0.0	0–0	0.00	0.0
Total feed costs	4.45	32.4	3.57–4.56	3.72	26.6
Total variable costs	5.13	37.3	4.20–5.22	4.45	31.8
Gross margin	**4.03**	**29.1**	**3.19–4.22**	**4.54**	**32.3**
Overhead costs					
Employed labour	1.20	8.7	0.82–1.72	1.08	7.6
Repairs and maintenance	0.50	3.6	0.38–0.63	0.47	3.3
All other overheads	0.46	3.3	0.29–0.54	0.35	2.5
Imputed labour	1.03	7.4	0.76–1.41	0.65	4.7
Depreciation	0.40	2.9	0.29–0.50	0.41	2.9
Total overhead costs	3.59	26.0	3.14–4.34	2.96	21.0
Variable and overhead costs	8.72	63.3	8.01–9.39	7.41	52.9
Earnings before interest and tax	**0.43**	**3.1**	**0.08–0.86**	**1.58**	**11.3**

Table 6 Cost of production

Farm costs	North average		Q1 to Q3 range	State top 25% average	
	$ kg/MS	**c/l**	**$ kg/MS**	**$ kg/MS**	**c/l**
Cash cost of production	7.39	53.6	6.73–7.90	6.63	47.2
Cost of production (excluding inventory changes)	8.82	64.0	8.22–9.49	7.70	54.9
Inventory change					
+/- feed and water inventory changes	-0.10	-0.6	-0.2–0.01	-0.29	-2.0
+/- livestock inventory changes minus purchases	-0.05	-0.4	-0.23–0.29	0.02	0.1
Cost of production (including inventory changes)	8.67	62.9	8.01–9.29	7.44	53.0

Cost of production

Cost of production gives an indication of the cost of producing a kilogram of milk solids. It is calculated as variable costs plus overhead costs (cash and non-cash) and accounts for changes in fodder and livestock inventory.

Table 6 shows that the average cost of production with inventory changes increased significantly this year to $8.38 kg/MS (62 c/l) from $7.33 kg/MS (54 c/l)in 2016–17.

Earnings before interest and tax

Earnings before interest and tax (EBIT) is gross farm income less variable and overhead costs (cash and non-cash).

The average EBIT across North farms this year increased to $0.43 kg/MS (3.1 c/l) compared to only $0.13 kg/MS (1.1 c/l) last year. This was mainly due to the higher gross farm income offsetting the increase in costs.

Figure 16 shows a wide range in EBIT across the North farms, from negative $0.83 kg/MS to $1.87 kg/MS sold. Fourteen of the North farms recorded a positive EBIT, with four farms having an EBIT less than zero.

The top 25% farms in the state recorded an average EBIT of $1.58 kg/MS (11.3 c/l), highlighting the strength of these well run businesses. Whilst their milk income was lower than the North average, they managed to keep costs lower and so generate a higher profit margin.

Return on total assets and equity

The return from total assets, including owned and leased assets, is RoTA. It is calculated as EBIT divided by total assets managed. Figure 17 shows RoTA per farm excluding capital appreciation.

The average return on total assets for participant farms this year was 1.1%, up from 0.5% the previous year. The range across the group was -2.9% to 5.0%.

Figure 16 Whole farm EBIT per kilogram of milk solids

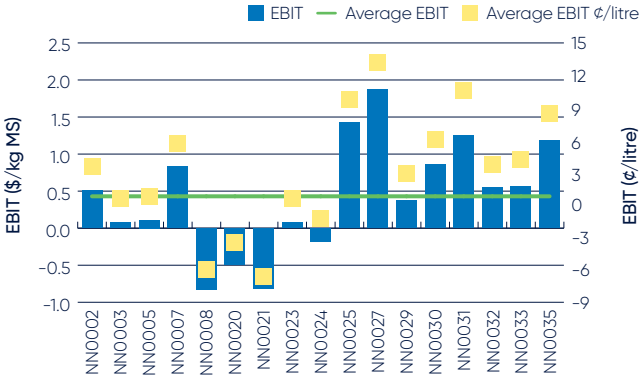


Figure 17 Return on total assets

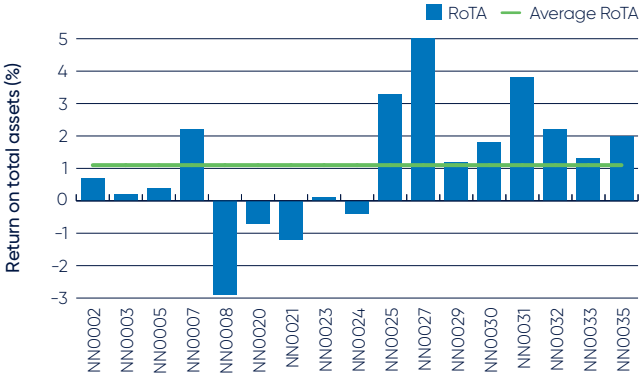
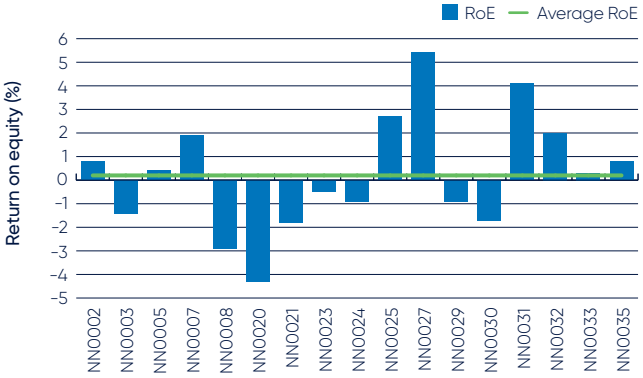


Figure 18 Return on equity



FEED CONSUMPTION AND FERTILISER

Farms in the North show a wide range of feeding systems, and directly grazed pasture was the main source of metabolisable energy on the majority of the farms in this region. The amount of pasture in the diet on average was similar to the previous year despite the dry seasonal conditions.

Feed consumption

The relative contribution of each feed type to the metabolisable energy (ME) consumption on each farm is shown in Figure 19. The broad range of different sources of ME used on individual farms is evident. Grazed pasture supplied 50% or more of ME consumed on 12 of the 17 farms this year, with the average being 53%, and the range was between 23% and 68%. The portion of the ME consumed derived from concentrates was lower this year at an average of 31%. All participant farms fed silage as part of their ME consumed with the range between 2% and 22%, and an average of 11% of the diet. Hay accounted for 4% of ME consumed on average, lower than the year before.

Despite the dry conditions continuing throughout the year, farmers were able to consume and conserve more pasture and silage than in the previous year.

The 'other' feed category includes feeds such as brewer's grain, molasses and palm kernel meal.

Figure 20 shows the estimated home grown feed consumed per milking hectare for farms in the North.

Total pasture harvested for the North on average was 8.8 t DM/ha, which was higher than the previous year of 8.2 t DM/ha. This included an average of 7.2 t DM/ha directly grazed and 1.6 t DM/ha conserved. This year four farms conserved no feed on the milking area.

This graph only shows pasture and fodder consumed on the milking area. It does not include fodder grown and conserved on the non-milking area. A number of farms grew fodder crops for silage or hay that were additional sources of home grown feed that are not reflected in Figure 20.

Farms that confine cows to a feedpad or feedlot for the majority of the year have a much smaller milking area by definition, than those farms where cows mainly graze. They will show as little or no pasture grazed on the milking area.

Potential sources of error in the method used to calculate home grown pasture consumed may come from the incorrect estimation of liveweight, amounts of fodder and concentrates fed, ME concentration of fodder, concentrate and pasture, wastage of feed and associative effects between feeds when they are digested by the animal. Comparing pasture consumption estimated using the back-calculation method between farms can lead to incorrect conclusions and a more useful approach is to compare pasture consumption on the same farm over time using the same method of estimation.

Fertiliser application

All farms in the North applied some fertiliser to their crops and pasture. This year, fertiliser application is reported on the milking area, rather than usable area as in previous years. This enables a comparison between nutrient usage and pasture consumption on the same area. Those farms with a very small milking area will show as using little or no fertiliser in this graph.

The average fertiliser application was 351kg/milking hectare. Farms in the North applied a lower level of nitrogen, but higher levels of phosphorus, potassium and sulphur per hectare in 2018–19 compared to the previous year (Figure 21).

Average nitrogen use was 151kg/ha, phosphorus 20kg/ha, potassium 41kg/ha and sulphur 22kg/ha this year.

These usage figures show that despite the lower rainfall, farmers kept up their fertiliser applications to ensure they made the most of the available moisture.

Figure 19 Sources of whole farm metabolisable energy

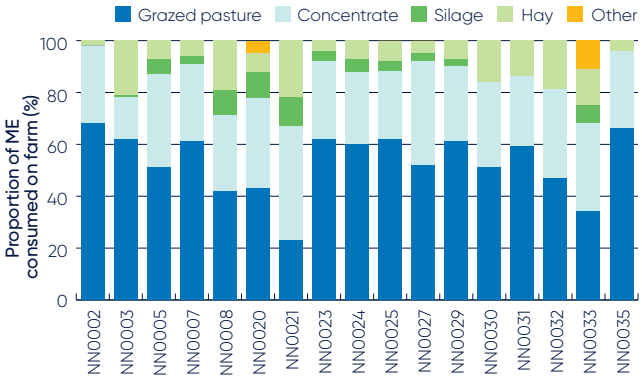


Figure 20 Estimated tonnes of home grown feed consumed

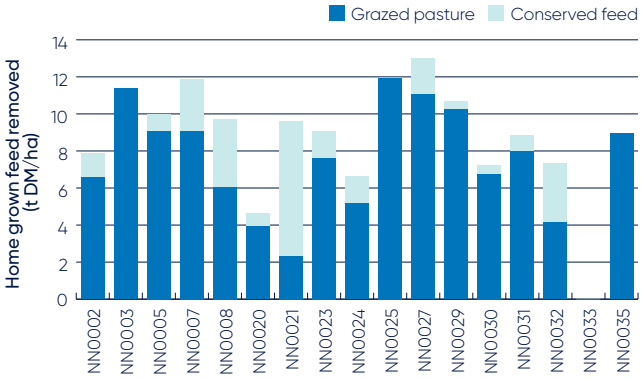
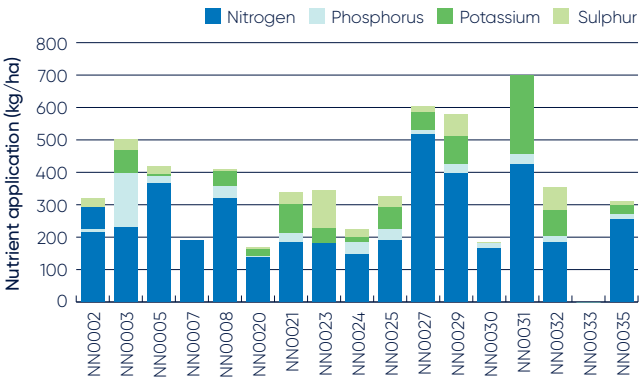


Figure 21 Nutrient application per milking area



The South

There were four new farms in the South dataset this year, and three farms from last year did not participate.

Seasonal conditions

Seasonal conditions were generally challenging with all farms receiving below average rainfall. Average annual rainfall for South farms was 556mm compared to 530mm in the previous year. Some areas, particularly on the south coast, received good falls of rain at times over the year and were able to make the most of it with fodder produced.

Irrigators on the regulated inland rivers have faced zero allocations for general security water in 2019, so have had to rely on carry over water, groundwater or purchasing temporary water.

Figure 22 shows the difference between annual rainfall and long term averages for each farm.

Whole farm analysis

Participant dairy farmers in the South received an average milk price of $7.37 kg/MS sold this year, up from $6.81 kg/MS in the previous year.

Average herd size for the South farms was 424 cows, and milk solids production per cow was higher this year at 546kg. The average home grown feed as a percentage of ME consumed was slightly higher at 56%, compared to 55% in the previous year. Stocking rate was also lower on average, at 1.2 cows/usable hectare.

Lower stocking rate and higher purchased feed prices, combined with limited rainfall and irrigation meant that farmers were focussed on making the most of whatever pasture and fodder they could grow. Home grown feed consumed per hectare was lower in the South than the year before.

Grain and fodder prices increased during 2019 and supply for hay continued to be tight. The NSW government provided drought rebates on transport for fodder and livestock, which although capped per farm helped to reduce the landed cost of purchased feed.

Labour efficiency was similar to the previous year.

Key whole farm physical parameters for the South are presented below in Table 7. The Q1 – Q3 range shows the band in which the middle 50% of farms for each parameter sit.

As explained on page 4 of this report, the top 25% shown are across all farms in the state, not for each region, due to the sample size.

Figure 22 Annual rainfall and long term average rainfall

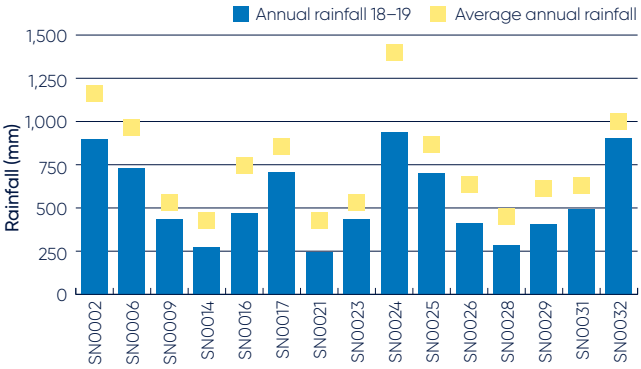


Table 7 Farm physical data

Farm physical parameters	South average	Q1 to Q3 range	State top 25% average
Annual rainfall 18–19 (mm)	556	412–718	810
Herd size	424	280–425	458
Total water use efficiency (t DM/100mm/ha)	0.8	0.5–1.0	1.0
Total usable area (hectares)	390	192–530	318
Milking cows per usable hectares	1.2	0.9–1.6	1.5
Milk sold (kg MS/cow)	546	500–562	524
Milk sold (kg MS/ha)	643	411–814	748
Home grown feed as percentage of ME consumed	56	56–62	65
Labour efficiency (milking cows/FTE)	83	64–95	80
Labour efficiency (kg MS/FTE)	44,612	34,855–47,572	40,299

Milk solids sold

Average milk solids sold per hectare decreased this year to 643 kg/MS/ha (8873 litres/ha), The range this year was between 368 MS/ha and 936 kg MS/ha (5,421 litres/ha to 13,858 litres/ha).

The average milk solids sold per cow were higher than last year, at 546 kg/MS/cow (7,590 litres/cow).

Figure 23 shows the kilograms of milk solids sold per usable hectare and per cow for each farm.

Gross farm income

Gross farm income includes milk sales net of levies and charges, livestock trading profit and other farm income.

The average gross farm income for South farms was $8.14 kg/MS (60.4 c/l), which included milk income of $7.37 kg/MS (54.9 c/l) plus all other income associated with the dairy business operation of $0.78 kg/MS (5.6 c/l).

This year's average gross farm income was 8.6% higher than last year's average. The milk price received was up 8%, livestock income was similar, and other farm income increased from last year. Other farm income includes drought support payments raised through campaigns from the major retailers on the sales of liquid milk.

Figure 24 shows the gross farm income for each farm.

Variable costs

Variable costs (shown as light blue bars in Figure 25) are all those costs that vary with the size of production in the enterprise, such as herd, shed and feed costs (including feed and water inventory changes).

The average variable cost was $5.10 kg/MS (38 c/l) with a range of $3.46kg MS to $7.29 kg/MS for participant farms in the South. This is 21% higher than in 2017–18 due mainly to an increase in feed costs. Herd and shed costs were similar to last year at $0.30 kg/MS and $0.26 kg/MS, respectively.

Feed costs were the most significant variable cost, accounting for 58% of total costs. Average feed costs including feed inventory change was $4.54 kg/MS (34 c/l), which is 25% higher than last year's cost of $3.63 kg/MS.

On average, feed inventory change was negligible, as farmers had little conserved feed on hand at the start of the year and were unable to make enough to carry over at the end of the year. However, there were some farms who had stored feed on hand and used it during the year, which represented an increase in feed costs.

The average cost of home-grown feed increased to $1.48 kg/MS, from $1.09 kg/MS in the previous year, affected by costs of fertiliser, fuel, irrigation, temporary water purchases and fodder conservation. Purchased feed and agistment cost was $3.06 kg/MS, up from $2.53 kg/MS in the previous year, reflecting the ongoing high prices for grain and hay.

The average cost of concentrates this year was $552 t DM, ($500 /t as fed), up from $398 t DM last year. The cost of concentrate includes the cost of additives and minerals. South farmers fed 2.1 t DM/head concentrates to the milkers, although this figure includes concentrates fed to young stock on the milking area.

The average cost of purchased hay this year was $390/t DM ($332 t as fed).

Figure 25 shows the breakdown of total farm costs per kg of MS sold. A breakdown of variable costs for the individual businesses is shown in Appendix Table C6.

Figure 23 Milk solids sold per hectare and per cow

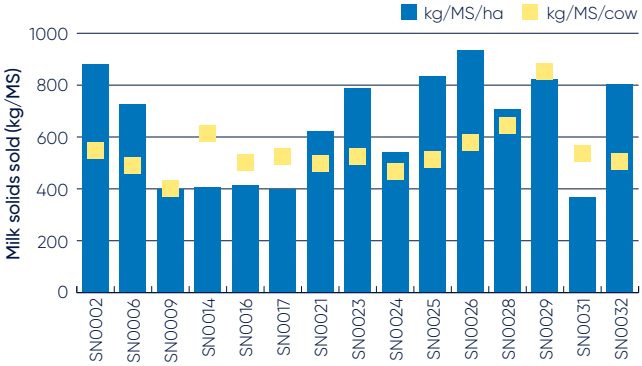


Figure 24 Gross farm income per kilogram of milk solids

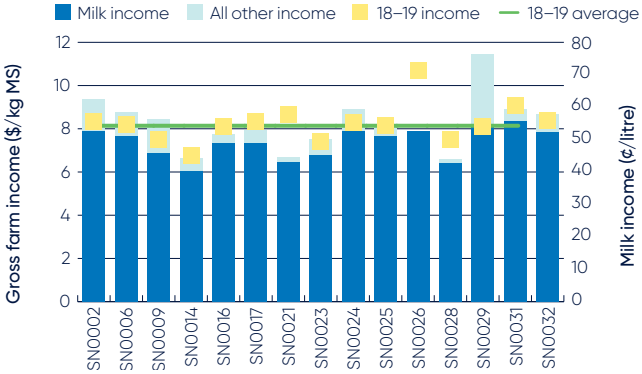
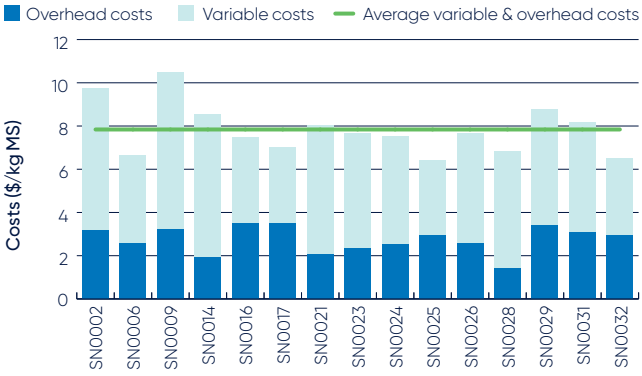


Figure 25 Whole farm variable and overhead costs



Overhead costs

Overhead costs are those costs incurred by the farm business that do not vary greatly with the level of production. These include cash overheads such as employed labour, rates and insurance as well as non-cash costs such as imputed owner operator and family labour and depreciation of plant and equipment.

The average overhead costs for 2018–19 were $2.74 kg/MS (20.3 c/l), similar to the previous year. The overhead costs this year ranged from $1.42 kg/MS to $3.51 kg/MS (shown as dark blue bars in Figure 25).

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

The main overhead cost category is labour, both employed and imputed, which at $1.67 kg/MS account for 60% of total overheads.

The percentage breakdown of the individual totals expressed as percentages is presented in Appendix Table C7.

Cost of production

Cost of production gives an indication of the cost of producing a kilogram of milk solids. It is calculated as variable costs plus overhead costs (cash and non-cash) and accounts for changes in fodder, water and livestock inventory.

Table 9 shows that the average cost of production with inventory changes increased this year to $7.97 kg/MS (59.7 c/l) from $6.84 kg/MS in 2017–18. The increase in cost of production was due to higher variable costs, mainly purchased and home grown feed costs.

The top 25% farms had considerably lower cost of production than the average. Note that the top 25% farms are across the whole state, not for each region, based on return on total assets.

Table 8 Average farm financial performance – southern NSW

Farm income and cost category	South average		Q1 to Q3 range	State top 25% average	
Income	**$ kg/MS**	**c/l**	**$ kg/MS**	**$ kg/MS**	**c/l**
Milk income (net)	7.37	54.9	6.82–7.87	7.99	57.1
Livestock trading profit	0.61	4.4	0.34–0.82	0.68	4.8
Other farm income	0.17	1.2	0–0.16	0.17	2.2
Total income	8.14	60.4	7.63–8.83	8.99	64.2
Variable costs					
Herd cost	0.30	2.2	0.24–0.38	0.40	2.9
Shed cost	0.26	1.9	0.18–0.33	0.34	2.4
Home grown feed cost	1.48	11.2	1.02–1.65	1.52	10.8
Purchased feed and agistment	3.06	22.6	2.45–3.33	2.48	17.7
Feed inventory change	-0.08	-0.4	-0.38–0.19	-0.29	-2.0
Water inventory change	0.07	0.6	0–0.03	0.00	0.0
Total feed costs	4.54	34.0	3.49–5.34	3.72	26.6
Total variable costs	5.10	38.2	4.01–5.71	4.45	31.8
Gross margin	**3.05**	**22.2**	**1.69–4.56**	**4.54**	**32.3**
Overhead costs					
Employed labour	0.83	6.2	0.61–0.98	1.08	7.6
Repairs and maintenance	0.38	2.8	0.29–0.39	0.47	3.3
All other overheads	0.34	2.5	0.28–0.39	0.35	2.5
Imputed labour	0.84	6.1	0.46–1.20	0.65	4.7
Depreciation	0.35	2.6	0.28–0.41	0.41	2.9
Total overhead costs	2.74	20.3	2.42–3.18	2.96	21.0
Variable and overhead costs	7.84	58.4	6.92–8.37	7.41	52.9
Earnings before interest and tax	**0.31**	**2.0**	**-0.32–1.45**	**1.58**	**11.3**

Earnings before interest and tax

Earnings before interest and tax (EBIT) is gross farm income less variable and overhead costs (cash and non-cash).

The average EBIT across farms this year decreased by 48% to $0.31 kg/MS (2.0 c/l), compared to $0.58 kg/MS (4 c/l) last year. The higher income received did not fully offset the increase in costs, resulting in a smaller profit margin.

Figure 26 shows a wide range in EBIT across the South farms, from negative $2.41 kg/MS to $2.17 kg/MS. Nine of the South farms recorded a positive EBIT, with six farms recording a negative result.

The top 25% farms in the state recorded an average EBIT of $1.58 kg/MS (11.3 c/l), highlighting the strength of these well run businesses. This was achieved through a combination of higher milk incomes and lower costs than the South average.

Return on total assets and equity

Return on total assets (RoTA) is the EBIT expressed as a percentage of total assets under management. Figures 27 and 28 show RoTA and Return on Equity (RoE) excluding capital appreciation.

The return on total assets was lower for participant farms this year, with an average of 0.3%, down from 2.1% in the previous year. Six farms had a negative or zero return on assets. The range was negative 8.6% to 5.9%.

Land value is a major component of the assets under management, and it is worth noting that there is a large variation in market values for land in the South region.

Return on equity (RoE) is the net farm income expressed as a percentage of owner's equity. It is a measure of the owner's rate of return on investment.

The average was lower this year at -2.1% compared with 0.6% last year. There was a wide range of return on equity reflecting the various capital structures of businesses in Southern NSW. Eight farms recorded a negative RoE.

For return on equity including capital appreciation refer to Appendix Table C1.

Figure 26 Whole farm earnings before interest and tax per kilogram of milk solids

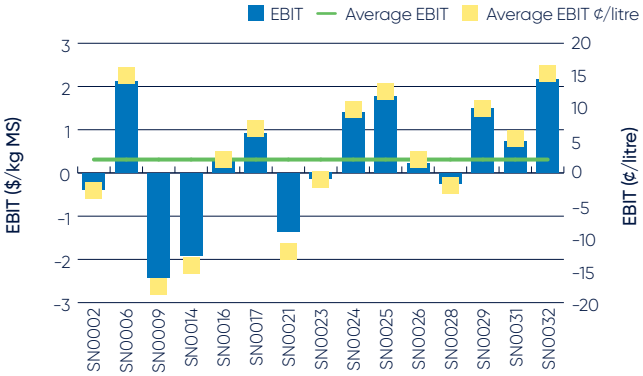


Figure 27 Return on total assets

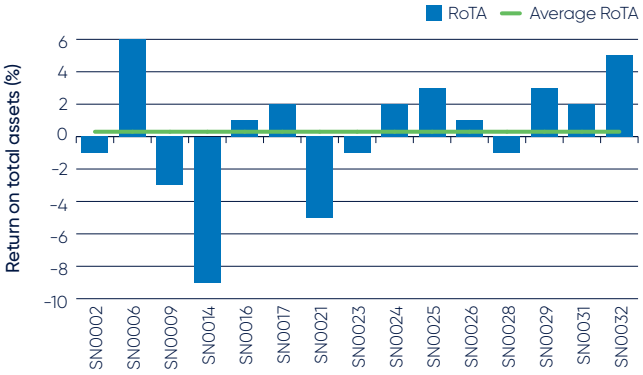


Figure 28 Return on equity

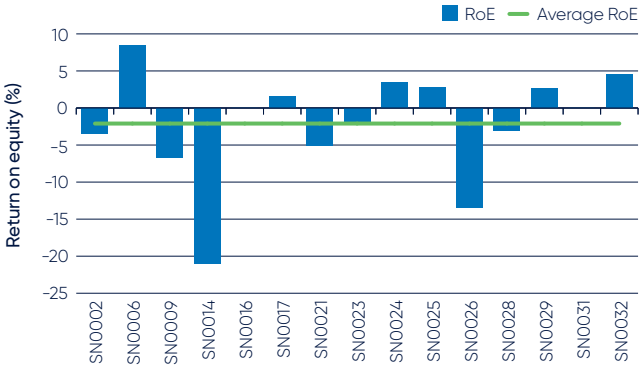


Table 9 Cost of production

Farm costs	South average		Q1 to Q3 range	State top 25% average	
	$ kg/MS	c/l	$ kg/MS	$ kg/MS	c/l
Cash cost of production	6.65	49.5	6.24–6.93	6.63	47.2
Cost of production (excluding inventory changes)	7.84	58.3	7.19–8.22	7.70	54.9
Investory change					
+/- feed and water inventory changes	0.00	0.2	-0.43–0.26	-0.29	-2.0
+/- livestock inventory changes minus purchases	0.14	1.2	-0.13–0.23	-0.02	0.1
Cost of production including inventory change	7.97	59.7	7.14–8.75	7.44	53.0

FEED CONSUMPTION AND FERTILISER

Southern participant farms show a wide range of feeding systems. In 2018–19 directly grazed pasture was not the main source of metabolisable energy on the majority of the farms in this region, due to the challenging seasonal conditions and the changing nature of feeding systems on these farms.

Feed consumption

The relative contribution of each feed type to the metabolisable energy (ME) consumption on each farm is shown in Figure 29. The broad range of different sources of ME used on individual farms is evident. Grazed pasture supplied 50% or more of ME consumed on only 5 of the 15 farms this year, with the average being 36%, similar to the 37% last year. The range was between 0% and 58%. The portion of the ME consumed derived from concentrates was similar this year at an average of 36%. All participant farms fed hay and silage at similar levels to the previous year. Hay and silage accounted for 27% of ME consumed on average.

This combination of less grazed pasture and more silage and hay being fed reflects the poorer pasture growing conditions, especially on non-irrigated farms.

The 'other' feed category includes feeds such as brewer's grain, molasses and palm kernel meal.

Figure 30 shows the estimated home grown feed consumed per milking hectare for farms in the South.

Total pasture harvested for the South on average was 6.4 t DM/ha, which was lower than the previous year of 7.2t. This year both the amount of directly grazed pasture was down, and the amount of conserved per hectare was lower than the previous year. This included an average of 5.3 t DM/ha directly grazed and 1.1 t DM/ha conserved.

This graph only shows pasture and fodder consumed on the milking area. It does not include fodder grown and conserved on the non-milking area. A number of farms grew fodder crops for silage or hay that were additional sources of home grown feed that are not reflected in Figure 30.

Farms that confine cows to a feedpad or feedlot area for the majority of the year have a much smaller milking area by definition, than those farms where cows mainly graze. They will show as little or no pasture removed from the milking area.

Potential sources of error in the method used to calculate home grown pasture consumed may come from the incorrect estimation of liveweight, amounts of fodder and concentrates fed, ME concentration of fodder, concentrate and pasture, wastage of feed and associative effects between feeds when they are digested by the animal. Comparing pasture consumption estimated using the back-calculation method between farms can lead to incorrect conclusions and a more useful approach is to compare pasture consumption on the same farm over time using the same method of estimation.

Fertiliser application

The proportion of nutrients in fertiliser applied per hectare on South farms in 2018–19 are shown in Figure 31.

This year, fertiliser application is reported on the milking area, rather than usable area as in previous years. This enables a comparison between nutrient usage and pasture consumption on the same area. Those farms with a very small milking area will show as using little or no fertiliser in this graph.

All farms applied some fertiliser to their crops and pasture, though not all on the milking area. The average fertiliser application was 207kg/milking hectare.

This year South farms applied a higher level of nitrogen, potassium and sulphur, and similar levels of phosphorus per hectare compared to the previous year.

Application rates in 2018–19 were: nitrogen 159kg/ha, phosphorus 17kg/ha, potassium 19kg/ha and sulphur 11kg/ha.

These usage figures show that despite the lower rainfall, farmers increased their nitrogen fertiliser applications to ensure they made the most of the available moisture.

The individual values relating to Figure 31 can be found in Appendix Table C2.

Figure 29 Sources of whole farm metabolisable energy

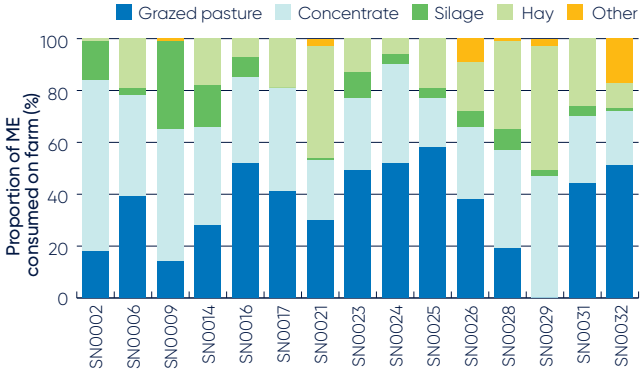


Figure 30 Estimated tonnes of home grown feed consumed per milking area hectare

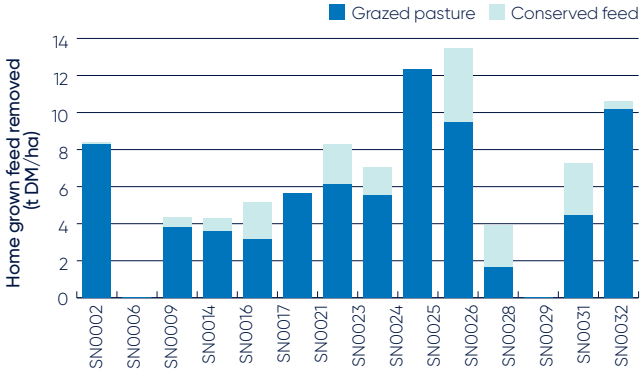
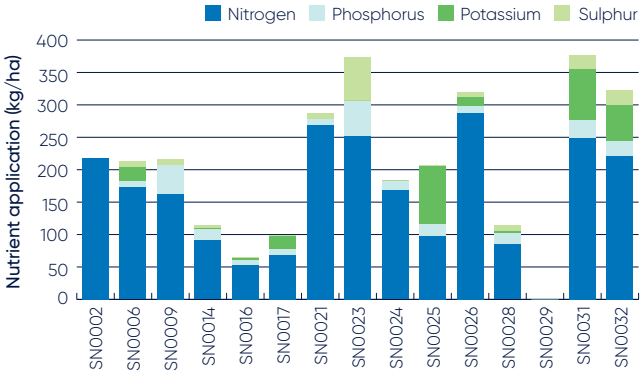


Figure 31 Nutrient application per milking hectare



Business confidence survey

Responses to this business confidence survey were made at the time of data collection in July and August 2019 with regard to the 2019–20 financial year and the next five years.

Expectations for business returns

Following lower average profits in the 2018–19 year, and the dry and challenging seasonal conditions, farmers' expectations about business profit for the 2019–20 season were generally positive. 47% of farmers in the North, and 36% in the South expected an improvement in business profit, whilst 33% in the North and 29% in the South thought profit would be stable.

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

While expectations of the coming year were spread across categories, there were some regional differences, as shown in Figure 32.

Around 80% of the participants in the North had an expectation of an improvement or no change in farm business returns in 2019–20. In the South, 65% of participants expected an improvement or no change to business returns. Some 20% of farmers across the state expected business profit to deteriorate.

Price and production expectations – milk

Expectations about milk price improving in 2019–20 were high across both regions, with over 86% of farmers expecting an increase in farm gate milk price.

As shown in Figure 33, intentions about increasing milk production were different across the regions. For the North farms, 47% of respondents intend to increase milk production, and 41% expected to remain the same. Only 12% expected milk production to decline.

Whereas with the South farms only 21% intended to increase production, whilst 71% expected to remain the same, and 7% expected their milk production to decrease in the next year.

Production expectations – fodder

Farmers were asked what they expected of their fodder production in the year ahead.

47% of participating farmers in the North expected fodder production to increase, with 41% expecting it to remain stable in 2019–20 (Figure 34). In the South the respondents were even less optimistic, with only 36% expecting an increase, 43% remaining stable and 21% expecting fodder production to decrease in the coming year.

A number of participants commented on what a tough season it had been, and were concerned about not being able to conserve as much fodder as they would like to in spring given the ongoing drought. They were also concerned about the lack of water in storages, and the impact this will have on irrigation and stock water.

Sourcing suitable conserved fodder, and the high cost of the limited supplies available were major concerns for farmers again this year.

Figure 32 Expected farm business profit in 2019–20

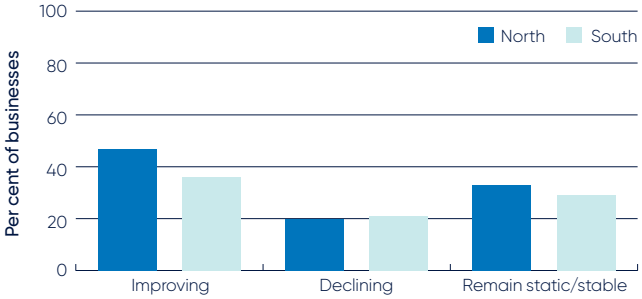


Figure 33 Producer expectations of prices and production of milk in 2019–20

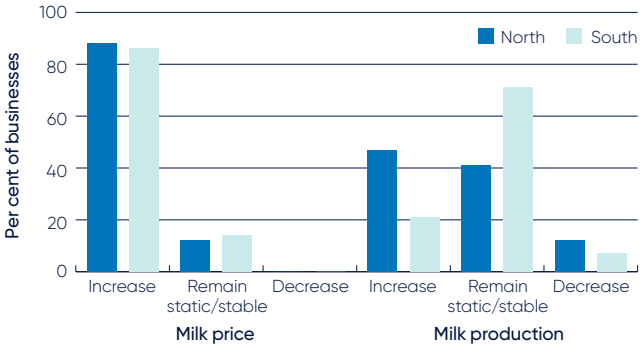
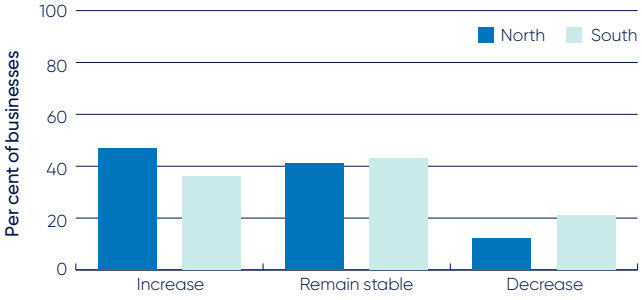


Figure 34 Producer expectations for production of fodder in 2019–20



Cost expectations

Figure 35 shows the expectations of costs for the dairy industry from participant farms in the project. The question refers to total costs to the business for each category, not the unit price for inputs, such as of grain or fertiliser. There was a mixed response to expectations of purchased feed costs, which are the largest cost category on most farms. 42% of respondents expected costs to rise, with 26% expecting no change, and 32% expecting purchased feed costs to decrease.

The majority of farmers (more than 60%) expected input costs in all the other categories to remain stable in the year ahead.

Major issues in the dairy industry – the next 12 months

The participants were asked to consider seven issues as identified in Figure 36, and to rank them based on the level of importance to their business for the upcoming year. They were asked to rank the issues from 1 to 8, with 1 being the most important, and 8 being the least important. They were also given the opportunity to identify other issues of importance to their business.

Figure 36 shows that almost half of the respondents identified seasonal conditions as the most important issue they are facing in the short term (next 12 months). With low rainfall continuing into the spring of 2019, and the forecast of continuing dry conditions, farmers commented that the impact of drought on water availability and growth of pasture and fodder, as the biggest issue. Milk price and input costs were the next most important issues. This is not surprising given the increase in cost of production and lower profit seen across the state last year.

Pasture and fodder, water, labour and succession planning were less important issues in the short term in this survey.

There were numerous comments from farmers about the impact of the drought on business viability, and the concern about how much longer it would continue. Some comments highlighted that the drought is affecting the morale of farmers and their families, and is tiring and relentless. Others said that the improvement in milk prices is encouraging, and that a break in the season is crucial for the prospects of a reasonable year ahead.

Major issues in the dairy industry – the next 5 years

The participants were asked to consider the importance of the same identified issues for their business, this time over the next five years (Figure 37).

The ranking of the highly important issues for the next five years among the respondents was very similar to those responses for the short term. The order of importance was climate/seasonal conditions, milk price, input costs, and water.

Farmers were also concerned about the longer term viability of the dairy industry, due to falling milk volumes and farmers exiting the industry. There were comments that milk price has improved but that high input costs were making it difficult to generate acceptable margins.

There was concern that dairy exits could cause loss of services to both the industry and the rural towns in general, including concerns about the loss of government advice and support from the industry.

Some other comments were:

- In the next five years expect the industry to strengthen with supply and demand impacting on milk production and the need to reward those still in the industry.
- Industry needs some positivity to be attractive to encourage new generations.
- Milk price and industry cohesion are major issues. Labour skill levels and reliability will be an increasing issue.

Other farmers stated that they would like to reduce debt over the next five years; whilst others were considering farm investments in infrastructure, including new dairies, but had put these off due to the tough year.

Figure 35 Producer expectations of costs for the dairy industry in 2018–19

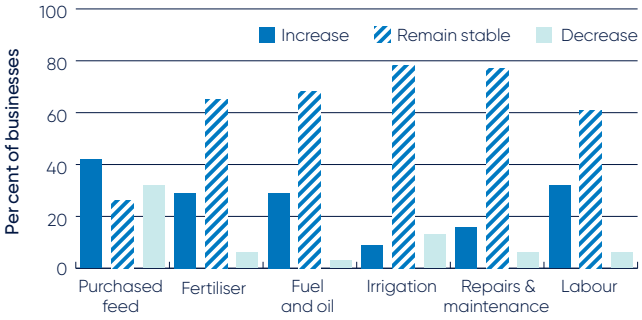


Figure 36 Major issues for individual businesses – 12 month outlook

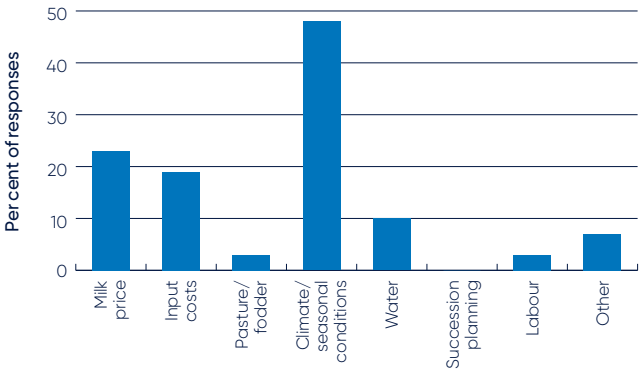
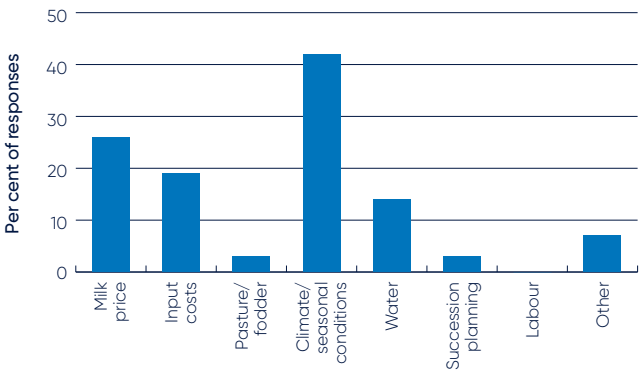


Figure 37 Major issues for individual businesses – 5 year outlook



Greenhouse gas emissions

The average emissions from participating farms was 16.0 tonnes of carbon dioxide equivalents per tonne of milk solids (t CO_2-e/t MS) in 2018–19. The most significant source of on-farm emissions was methane from ruminant digestion, contributing 64% of total farm emissions. The next biggest contributor was from pre-farm emissions sources (carbon dioxide from purchased feed and fertiliser), contributing 13%.

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).

The method of estimating Australia's dairy industry greenhouse gas emissions reflects new research outcomes and aligns with international guidelines. The GWP for the three gases discussed in this report is 1: 25: 298 (carbon dioxide; CO_2: methane; CH_4: nitrous oxide; N_2O). This year the greenhouse emission was calculated through DairyBase using the Australian Dairy Carbon Calculator.

The distribution of different emissions for 2018–19 is shown in Figure 38. Greenhouse gas emissions per tonne of milk solids produced ranged from 12.1 t CO_2-e/t MS to 20.8 t CO_2-e/t MS with an average emission level of 16.0 t CO_2-e/t MS.

Methane was identified as the main greenhouse gas emitted from dairy farms, accounting for 10.2 t CO_2-e/t MS, 64% of all greenhouse emissions. Methane produced from ruminant digestion (enteric CH_4) 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 10% of total emissions on average across the state in 2018–19.

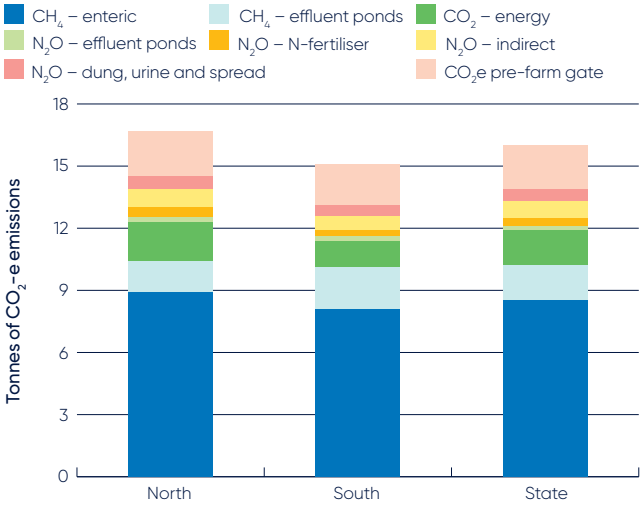
The second main greenhouse gas emission was CO_2 being produced primarily from fossil fuel consumption as either electricity or petrochemicals. Carbon dioxide accounted for 23% of total emissions (3.8 t CO_2-e/t MS) in 2018–19. The estimation of greenhouse gas emissions includes a pre-farm gate emission source. These are the greenhouse gases emitted during the manufacturing of fertilisers and the production of purchased fodder, grain and concentrates. Pre-farm gate sources accounted for 13% of the emissions and 10% from on-farm energy sources. Output levels were highly dependent on the source of electricity used with an increasing number of farms installing solar panels to generate electricity and offset the rising cost of electricity.

The third main greenhouse gas emission was nitrous oxide N_2O, accounting for 13% of total emissions or 2.0 t CO_2-e/t MS. This gas is produced from wastes (dung and urine); applied fertiliser and effluent ponds.

Nitrous oxide emissions from fertiliser accounted for 2.4% of total emissions, effluent ponds accounted for 1.4% and excreta accounted for 3.6%. Nitrous oxide from indirect emissions was 5.1%. Nitrous oxide emissions are highest in warm, waterlogged soils with readily available nitrogen. Over application of nitrogen, high stocking intensity and flood irrigation are all potential causes of increased nitrogen loss as N_2O. Strategic fertiliser management practices can reduce N_2O emissions and improve nitrogen efficiency.

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

Figure 38 Greenhouse gas emissions per tonne of milk solids produced



North

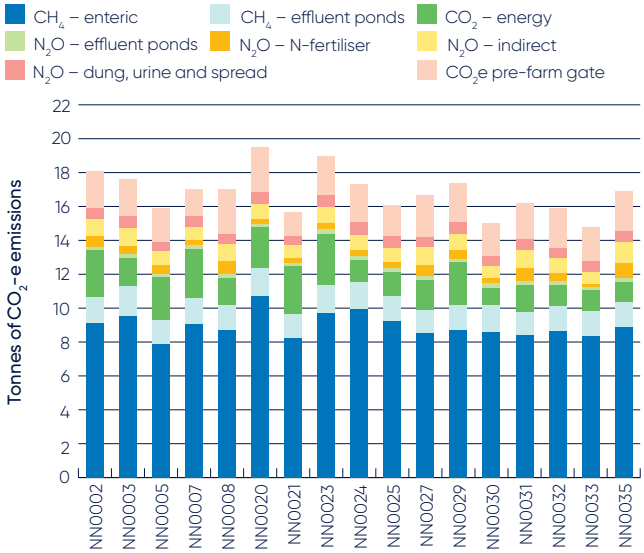
Participant farms in the North emitted an average of 16.7 t CO_2-e/t MS in 2018–19, mainly from methane produced by ruminant digestion (62%) and nitrous oxide from effluent and fertiliser (13%).

Methane was the main greenhouse gas emitted from participant farms in the North, accounting for 10.4 t CO_2-e/t MS, 62% of the average total greenhouse emissions (Figure 49). Methane produced from ruminant digestion contributed 8.9 t CO_2-e/t MS to regional average emissions while methane from effluent ponds accounted for 1.5 t CO_2-e/t MS.

Carbon dioxide accounted for 4.1 t CO_2-e/t MS, 24% of emissions in 2018–19, which comprised 1.9 t CO_2-e/t MS from fossil fuels and 2.2 t CO_2-e/t MS from pre-farm gate sources.

Nitrous oxide emissions contributed 2.2 t CO_2-e/t MS, 13% of all emissions. Direct emissions from applied nitrogen fertiliser, effluent management systems and animal wastes accounted for 1.3 t CO_2-e/t MS. The balance of 0.9 t CO_2-e/t MS came from ammonia and nitrate loss in soils as indirect sources.

Figure 39 Greenhouse gas emissions per tonne of milk solids produced – North



South

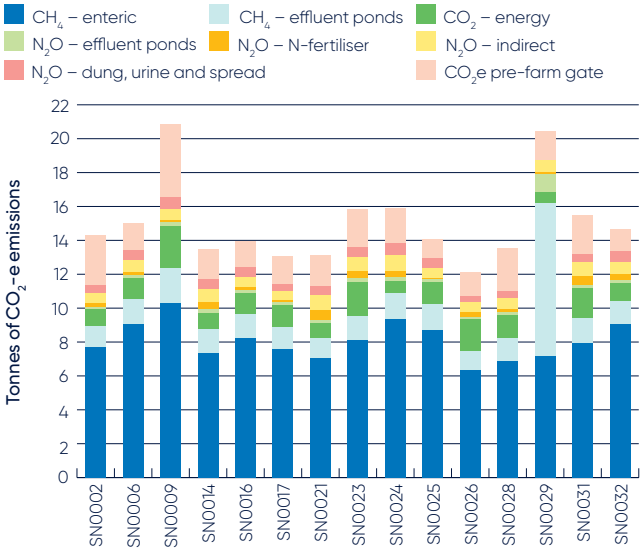
Participant farms in the South emitted an average of 15.1 t CO_2-e/t MS in 2018–19. The two main sources of the emissions were methane gas from ruminant digestion (62% of the total emissions) and carbon dioxide from purchased feed and fertiliser (13%).

Methane was the main greenhouse gas emitted from participant farms in the South accounting for 9.4 t CO_2-e/t MS, 66% of the average total greenhouse emissions. Methane produced from ruminant digestion was 8.1 t CO_2-e/t MS and CH_4 from effluent ponds accounted for 1.3 t CO_2-e/t MS (Figure 40).

Carbon dioxide emissions were 3.3 t CO_2-e/t MS, 23% of emissions in 2018–19, comprised of 1.3 t CO_2-e/t MS from fossil fuels and 2.0 t CO_2-e/t MS from pre-farm gate sources.

Nitrous oxide emissions contributed 1.7 t CO_2-e/t MS, 12% of all emissions. Direct emissions from applied nitrogen fertiliser, effluent management systems and animal wastes accounted for 1.3 t CO_2-e/t MS. The balance of 0.7 t CO_2-e/t MS came from ammonia and nitrate loss in soils as indirect sources.

Figure 40 Greenhouse gas emissions per tonne of milk solids produced – South



Historical analysis

The 2018–19 year was another very tough one for the NSW dairy industry as the drought continued, pushing up input prices and cost of production. Whilst milk price increased, so too did the cost of purchased grain, other concentrates and fodder.

Average statewide farm profits in 2018–19 were the lowest in the eight-year history of the project, both for EBIT and return on total assets. However, the two regions fared differently, with the North farms improving profit, whilst the South farms saw a marked decline. This is the first time that the farms in the North have had higher profitability than the South in all eight years since 2011–12.

The graphs below show the trends in profits and returns over the past eight years of the project. This section compares the performance of participant farms in the Dairy Farm Monitor Project over the past eight years. The historical analysis compares the trends in farm performance within and between the two regions. 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 be taken when comparing the performance across years.

The North

Farm profits improved in the North this year, coming off the lowest point in the previous year. The eight-year average for return on total assets (Figure 41) for the North is 1.4%, with a range of 0.5% to 3.0%. This year RoTA was 1.1% .

The eight-year average return on equity was -0.1%, with a range of negative 1.7% to 2.2%. This year the North RoE was 0.2%.

Figure 42 shows the trend in earnings before interest and tax (EBIT) and in net farm income (NFI). The difference between EBIT and NFI is interest and lease costs.

In 2018–19 the average EBIT per farm was $87,175, up from $39,802 last year. The eight-year average (in real terms – including inflation) for EBIT for North farms was $97,331 per farm.

Regarding net farm income, for three out of the eight years the average was negative, meaning many farms made a loss after covering the cost of debt servicing and leasing. This year the average NFI improved to $3,301 per farm.

The 2018–19 year saw milk price improve by 6% in the North, and other farm income also increased. So while production costs also rose, the higher income meant the profit margin was higher. Feed costs were the main contributor to the rise in costs, reaching $4.45 kg/MS – the highest in the life of the project.

Figure 41 Historical whole farm performance – North

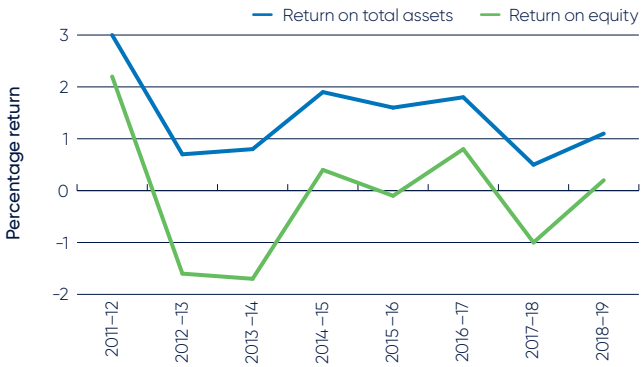
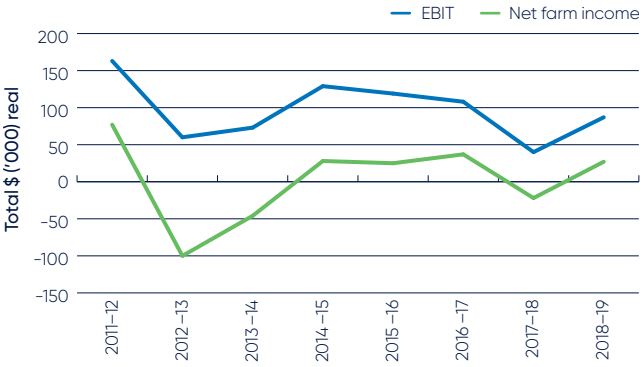


Figure 42 Historical farm profitability (real $) – North



The South

The graphs below show the trends in profits and returns over the past eight years. 2018–19 saw the lowest profit levels for the South region over the life of the project. The eight-year average for return on assets (Figure 43) for the South is 3.5%, with a range of 0.3 to 5.5%; and for return on equity the average was 2.6%, with a range of -2.1 to 5.7%.

Figure 44 shows the trend in earnings before interest and tax (EBIT) and in net farm income. 2018–19 was the lowest profit year over the course of the project, with an average EBIT per farm of $15,061, down from $141,549 in the previous year. The eight-year average EBIT for South farms was $264,622.

As experienced in the North, 2018–19 saw milk price improve by 8%, but higher feed costs brought profits down. Feed costs reached over $4.54 kg/MS, the highest in the life of the project. In contrast, overhead costs were maintained at similar levels to previous years.

Average return on total assets for the South farms in 2018–19 was 0.3%, which was the lowest in the eight-year history of the project. Return on equity was also the lowest at -2.1%.

There has been a steady downward trend in profits and returns in the South since 2014–15.

Figure 43 Historical whole farm performance – South

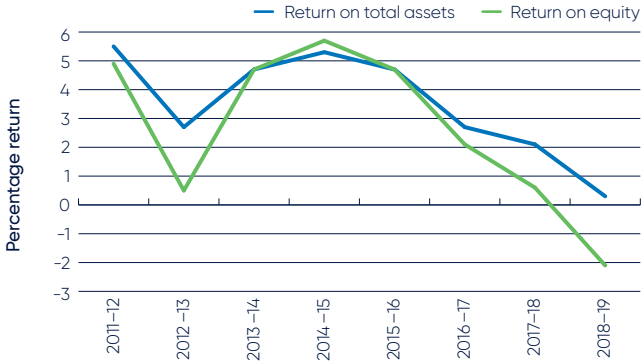
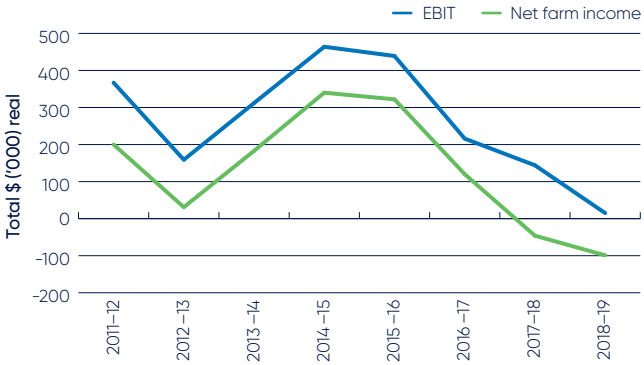


Figure 44 Historical farm profitability – South



Regional comparison

Profitability performance of the two regions over the last seven years is compared in Figures 45 to 48.

In 2018–19 the South continued the downward trend for the past five years, to the lowest levels over the history of the project.

Whereas the North farms experienced an improvement in profit compared to the previous year, and showed a higher return than the South farms for the first time in the project

The South has performed well over time, and for total earnings before interest and tax in real terms the South's performance had surpassed that of the North for each of the previous seven years. This region has also received a lower milk price than the North each year in the history of the project, reflecting the influence of the southern milk pool. In contrast, the majority of the milk from Northern New South Wales is used for liquid domestic milk supply in both New South Wales and south east Queensland.

Despite the lower milk price, the South farms have generated a higher EBIT, higher return on total assets and higher return on equity each year than the North farms. This is primarily due to the cost of production in the South being consistently lower than the North. However, in 2018–19 the extra income in the North outweighed the increase in costs.

Figure 45 Regional historical EBIT

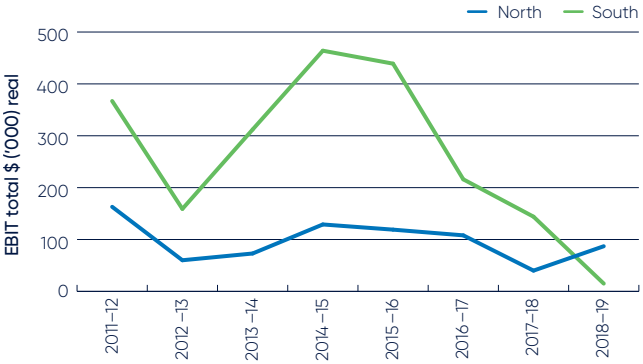


Figure 46 Regional historical net farm income

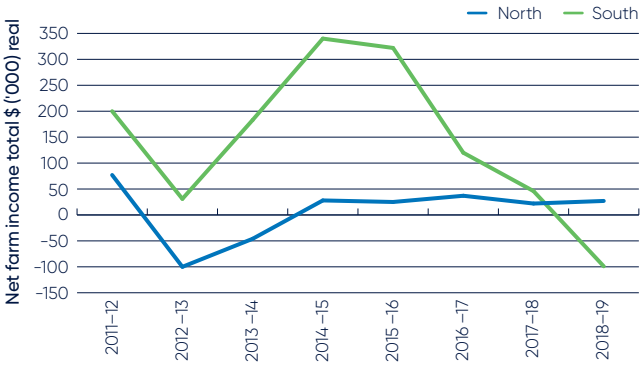


Figure 47 Regional historical return on total assets

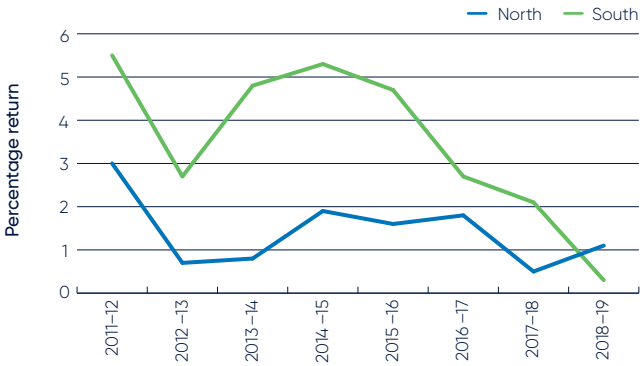
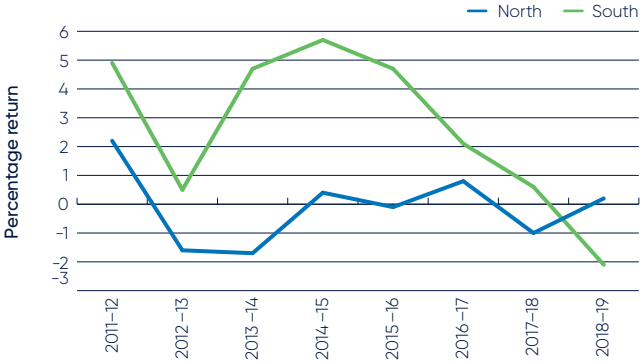


Figure 48 Regional historical return on equity



APPENDICES

Appendix A Statewide summary tables

Table A1 Main financial indicators

	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	%
Average	7.74	0.94	8.68	5.11	3.19	62	0.38	0.7	0.54	6.1	-0.16	-0.8
Top 25	7.99	1.01	8.99	4.45	2.96	60	1.58	3.9	0.59	6.5	0.99	4.1

Table A2 Physical information

	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	%	%
Average	342	144	0.7	373	1.3	491	610	4.1	3.3
Top 25	318	138	1.0	458	1.5	524	748	3.9	3.2

	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
Average	6.3	1.8	60	125.5	16.6	25.0	14.6	77	37,908
Top 25*	8.2	1.3	65	143.4	15.5	49.4	15.7	80	40,299

*on milking area

Table A3 Purchased feed

	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
Average	2.5	567	344	439	368	526	40
Top 25	2.3	554	–	445	249	506	35

Table A4 Variable costs

	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
Average	0.11	0.16	0.04	0.17	0.14	0.62	0.46	0.28	0.25
Top 25	0.15	0.19	0.06	0.16	0.18	0.74	0.45	0.11	0.24

	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
Average	0.20	0.36	0.02	0.39	2.54	0.04	-0.09	4.49	5.11
Top 25	0.22	0.50	0.01	0.16	2.28	0.03	-0.29	3.72	4.45

Table A5 Overhead costs

	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
Average	0.07	0.11	0.07	0.44	0.16	1.03	1.88	0.38	0.94	3.19
Top 25	0.07	0.11	0.05	0.47	0.12	1.08	1.89	0.41	0.65	2.96

Table A6 Variable costs – percentage

	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
Average	1.4	1.9	0.6	2.0	1.7	7.6	5.6	3.4	3.0
Top 25	2.0	2.6	0.8	2.1	2.4	10.0	6.1	1.3	3.2

	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
Average	2.4	4.5	0.3	4.6	30.5	0.5	-1.3	54.0	61.6
Top 25	3.0	6.7	0.2	2.2	30.8	0.5	-4.1	49.9	59.9

Table A7 Overhead costs – percentage

	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 c osts	% of costs	% of costs	% of costs	% of costs	% of costs
Average	0.9	1.3	0.9	5.3	12.4	22.6	4.6	11.2	38.4	11.2
Top 25	0.9	1.5	0.7	6.3	14.2	25.3	5.7	9.1	40.1	9.1

Table A8 Capital structure

Farm assets				
	Land value	Land value	Permanent water value	Permanent water value
	$/ha	$/cow	$/ha	$/cow
Average	16,439	13,323	2,406	2,238
Top 25	20,148	13,884	3,565	3,355

Other farm assets (per usable hectare)				
Plant and equipment	Livestock	Hay and grain	Other assets	Total assets
$/ha	$/ha	$/ha	$/ha	$/ha
1,711	2,957	326	545	23,301
2,307	3,676	419	365	28,508

Liabilities	
Liabilities per usable hectare	Liabilities per milking cow
$/ha	$/cow
6,717	5,225
8,161	5,857

Equity	
Equity per usable hectare	Average equity
$/ha	%
17,215	76
20,347	73

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	6.43	7.18	7.20	8.04	0.33	0.37	0.28	0.31	3.18	3.55	3.79	4.23
2013–14	7.15	7.75	8.00	8.67	0.31	0.33	0.30	0.32	3.46	3.75	4.06	4.40
2014–15	7.46	7.96	8.44	9.01	0.32	0.34	0.29	0.31	3.55	3.79	4.16	4.44
2015–16	7.34	7.76	8.23	8.70	0.35	0.37	0.27	0.28	3.33	3.52	3.94	4.16
2016–17	6.89	7.15	7.94	8.24	0.38	0.39	0.26	0.27	3.27	3.39	3.91	4.06
2017–18	7.27	7.39	8.00	8.13	0.36	0.37	0.28	0.29	3.89	3.95	4.53	4.60
2018–19	7.74	7.74	8.68	8.68	0.31	0.31	0.31	0.31	4.49	4.49	5.11	5.11
Average		**7.60**		**8.54**		**0.36**		**0.30**		**3.74**		**4.39**

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.

	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	1.71	1.91	1.19	1.33	2.90	3.24	0.51	0.57	0.62	0.69	0.10	0.11	1.7	-0.5
2013–14	1.80	1.95	1.25	1.35	3.05	3.31	0.88	0.95	0.62	0.68	0.26	0.28	2.6	1.3
2014–15	1.71	1.83	1.25	1.33	2.96	3.16	1.32	1.41	0.60	0.64	0.72	0.77	3.5	2.8
2015–16	1.75	1.85	1.41	1.49	3.16	3.34	1.12	1.18	0.54	0.57	0.58	0.61	3.0	2.1
2016–17	1.80	1.87	1.31	1.36	3.11	3.23	0.92	0.95	0.51	0.53	0.41	0.43	2.2	1.4
2017–18	1.70	1.73	1.44	1.46	3.14	3.19	0.33	0.34	0.51	0.52	(0.18)	(0.18)	1.2	-0.3
2018–19	1.88	1.88	1.32	1.32	3.19	3.19	0.38	0.38	0.54	0.54	(0.16)	(0.16)	0.7	-0.8
Average		**1.85**		**1.38**		**3.23**		**0.91**		**0.60**		**0.31**	**2.4**	**1.2**

Table A10 Historical data – average farm physical information

	Total usable area	Milking area	Water used	Number of milking cows	Milking cows per useable area	Milk sold	Milk sold	Estimated grazed pasture*	Estimated conserved feed*	Home grown feed as of ME consumed	Concentrate price	
Year	ha	ha	mm/ ha	hd	hd/ ha	kg MS/ cow	kg MS/ ha	t DM/ ha	t DM/ ha	% of ME	Nominal ($/t DM)	Real ($/t DM)
2012–13	329	140	0.55	349	1.2	492	608	6.9	1.3	56	323	361
2013–14	301	119	0.60	309	1.1	504	569	6.0	1.1	57	412	446
2014–15	287	128	0.51	338	1.2	506	602	6.5	1.8	58	413	441
2015–16	287	126	0.55	351	1.3	504	618	6.2	2.1	55	392	414
2016–17	263	120	0.56	326	1.3	498	646	6.9	1.6	59	357	370
2017–18	251	118	0.67	337	1.4	488	683	6.0	1.6	56	423	430
2018–19	342	144	0.74	373	1.3	491	610	6.3	1.8	60	567	567
Average	**295**	**128**	**0.58**	**345**	**1.3**	**495**	**624.8**	**6.4**	**1.6**	**57**		**422**

*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 North summary tables

Table B1 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	%
NN0002	7.67	2.36	10.03	5.03	4.49	53	0.51	0.7	0.12	1.2	0.39	0.8
NN0003	8.21	0.96	9.17	4.72	4.37	52	0.08	0.2	0.43	4.6	-0.34	-1.4
NN0005	8.41	0.68	9.09	5.22	3.76	58	0.11	0.4	0.00	0.0	0.11	0.4
NN0007	7.45	0.81	8.26	4.71	2.71	63	0.83	2.2	0.35	4.3	0.48	1.9
NN0008	7.77	1.25	9.02	6.53	3.32	66	-0.83	-2.9	0.00	0.0	-0.83	-2.9
NN0020	8.17	2.41	10.58	6.40	4.68	58	-0.49	-0.7	1.46	13.8	-1.95	-4.3
NN0021	7.78	0.82	8.60	5.43	3.98	58	-0.81	-1.2	0.29	3.4	-1.10	-1.8
NN0023	7.71	1.05	8.77	4.12	4.57	47	0.08	0.1	0.40	4.6	-0.32	-0.5
NN0024	7.75	1.36	9.11	5.56	3.73	60	-0.18	-0.4	0.11	1.3	-0.30	-0.9
NN0025	8.61	0.80	9.40	4.55	3.43	57	1.43	3.3	0.65	6.9	0.77	2.7
NN0027	8.82	1.07	9.89	5.19	2.84	65	1.87	5.0	0.86	8.7	1.01	5.4
NN0029	7.91	0.48	8.39	5.50	2.51	69	0.37	1.2	0.56	6.7	-0.19	-0.9
NN0030	8.95	0.38	9.33	4.14	4.34	49	0.86	1.8	1.16	12.4	-0.30	-1.7
NN0031	7.78	0.57	8.35	4.74	2.36	67	1.25	3.8	0.16	1.9	1.09	4.1
NN0032	7.46	0.96	8.42	4.72	3.14	60	0.55	2.2	0.14	1.7	0.41	2.0
NN0033	8.47	1.48	9.95	5.94	3.44	63	0.56	1.3	0.45	4.6	0.11	0.3
NN0035	8.29	1.04	9.32	4.71	3.44	58	1.18	2.0	0.87	9.3	0.31	0.8
Average	**8.07**	**1.09**	**9.16**	**5.13**	**3.59**	**59**	**0.43**	**1.1**	**0.47**	**5.0**	**-0.04**	**0.2**

Table B2 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	%	%
NN0002	222	50	0.28	90	0.41	451	183	3.7	3.2
NN0003	215	89	0.71	400	1.86	331	616	4.2	3.2
NN0005	193	80	0.58	290	1.50	506	761	4.1	3.3
NN0007	255	130	0.74	300	1.18	510	599	3.7	3.1
NN0008	212	130	0.88	320	1.51	496	749	4.0	3.1
NN0020	177	65	0.66	185	1.05	370	386	3.8	3.2
NN0021	88	60	0.85	160	1.82	401	728	4.7	3.6
NN0023	85	36	0.50	90	1.06	423	448	3.7	3.2
NN0024	277	130	0.73	270	0.97	438	427	3.7	3.0
NN0025	260	120	0.78	430	1.65	486	803	3.8	3.1
NN0027	287	100	0.78	400	1.39	486	677	3.8	3.3
NN0029	135	60	0.75	207	1.53	493	755	4.3	3.5
NN0030	98	70	1.00	210	2.14	368	788	3.8	3.2
NN0031	343	188	0.73	580	1.69	408	689	4.9	3.6
NN0032	616	450	0.88	850	1.38	451	623	3.7	3.1
NN0033	1,378	1	0.28	550	0.40	478	191	4.2	3.4
NN0035	240	80	0.45	240	1.00	435	435	3.9	3.3
Average	**299**	**108**	**0.68**	**328**	**1.33**	**443**	**580**	**4.0**	**3.3**

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
NN0002	6.55	1.34	71	60	3	19	8	55	24,741
NN0003	11.37	0.00	83	151	91	66	60	74	24,504
NN0005	9.07	0.92	58	209	13	5	15	57	28,723
NN0007	9.08	2.78	69	97	0	0	0	68	34,899
NN0008	6.06	3.63	64	310	45	45	6	78	38,886
NN0020	3.94	0.71	52	58	3	9	3	77	28,494
NN0021	2.33	7.25	57	125	19	62	24	75	30,042
NN0023	7.62	1.43	66	97	2	20	58	53	22,368
NN0024	5.16	1.50	66	68	18	8	11	64	28,045
NN0025	11.94	0.00	70	147	28	52	26	72	35,211
NN0027	11.05	1.97	57	239	13	21	8	69	33,730
NN0029	10.22	0.48	64	204	20	47	49	95	46,630
NN0030	6.76	0.47	59	130	14	0	1	65	23,981
NN0031	7.96	0.87	73	297	22	179	2	89	36,429
NN0032	4.14	3.20	66	150	21	57	72	81	36,752
NN0033	0.01	0.00	51	14	2	8	2	71	33,809
NN0035	8.95	0.00	70	211	13	25	10	84	36,644
Average	**7.19**	**2.04**	**64**	**151**	**19**	**37**	**21**	**72**	**31,993**

*on milking area

Table B3 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
NN0002	1.49	727.8	0.0	0.0	0.0	727.8	29
NN0003	0.80	654.1	0.0	313.6	0.0	612.5	17
NN0005	2.72	499.6	0.0	617.7	0.0	489.3	42
NN0007	2.07	702.1	0.0	625.9	0.0	698.2	31
NN0008	1.92	658.8	598.8	569.8	0.0	636.9	36
NN0020	2.88	564.7	0.0	487.1	350.3	526.7	48
NN0021	2.19	541.2	0.0	0.0	0.0	541.2	43
NN0023	2.00	421.7	0.0	281.2	0.0	410.9	34
NN0024	2.58	720.4	0.0	496.6	0.0	635.8	34
NN0025	1.79	552.8	0.0	506.2	0.0	547.8	30
NN0027	2.45	593.3	0.0	451.2	0.0	555.3	43
NN0029	2.32	564.6	318.3	664.4	439.4	552.6	36
NN0030	1.74	547.1	168.6	0.0	0.0	462.8	41
NN0031	1.27	598.2	0.0	0.0	0.0	598.2	27
NN0032	1.93	382.1	0.0	470.6	0.0	380.3	34
NN0033	3.77	493.5	0.0	366.2	382.1	449.4	49
NN0035	1.67	654.2	0.0	0.0	0.0	654.2	30
Average	**2.09**	**581.0**	**361.9**	**487.5**	**390.6**	**557.7**	**36**

Table B4 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
NN0002	0.12	0.15	0.00	0.17	0.23	0.67	0.65	0.16	0.23
NN0003	0.16	0.18	0.07	0.25	0.15	0.81	0.67	0.00	0.69
NN0005	0.17	0.25	0.01	0.16	0.16	0.75	0.92	0.32	0.22
NN0007	0.05	0.11	0.01	0.19	0.19	0.55	0.22	0.53	0.06
NN0008	0.25	0.37	0.01	0.10	0.21	0.94	1.02	0.27	0.55
NN0020	0.00	0.07	0.00	0.41	0.39	0.87	0.26	0.12	0.23
NN0021	0.04	0.26	0.02	0.16	0.11	0.60	0.47	0.35	0.27
NN0023	0.05	0.18	0.00	0.23	0.17	0.64	0.52	0.27	0.18
NN0024	0.09	0.18	0.04	0.17	0.13	0.60	0.43	0.07	0.16
NN0025	0.24	0.18	0.10	0.18	0.13	0.83	0.57	0.21	0.36
NN0027	0.13	0.21	0.04	0.14	0.14	0.66	0.55	0.17	0.05
NN0029	0.16	0.14	0.12	0.22	0.04	0.68	0.69	0.30	0.14
NN0030	0.00	0.11	0.06	0.19	0.08	0.44	0.30	0.00	0.14
NN0031	0.23	0.04	0.15	0.17	0.20	0.78	0.71	0.00	0.16
NN0032	0.11	0.19	0.01	0.10	0.16	0.56	0.58	0.01	0.28
NN0033	0.03	0.15	0.03	0.18	0.11	0.50	0.14	0.00	0.34
NN0035	0.02	0.14	0.12	0.22	0.13	0.64	0.72	0.00	0.40
Average	**0.11**	**0.17**	**0.05**	**0.19**	**0.16**	**0.68**	**0.55**	**0.16**	**0.26**

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
NN0002	0.30	0.28	0.00	0.00	3.14	0.00	-0.41	4.36	5.03
NN0003	0.23	0.63	0.05	0.10	1.59	0.00	-0.05	3.91	4.72
NN0005	0.09	0.22	0.01	0.40	1.98	0.00	0.32	4.47	5.22
NN0007	0.10	0.28	0.00	0.14	2.87	0.04	-0.07	4.16	4.71
NN0008	0.21	0.49	0.00	0.74	2.65	0.00	-0.34	5.59	6.53
NN0020	0.15	0.15	0.00	1.00	3.69	0.00	-0.08	5.52	6.40
NN0021	0.37	0.30	0.00	0.00	3.27	0.00	-0.13	4.83	5.43
NN0023	0.13	0.23	0.10	0.11	1.98	0.00	-0.04	3.48	4.12
NN0024	0.20	0.43	0.00	0.53	3.35	0.00	-0.20	4.95	5.56
NN0025	0.23	0.43	0.00	0.20	2.08	0.00	-0.35	3.72	4.55
NN0027	0.21	0.38	0.05	0.24	3.08	0.00	-0.19	4.53	5.19
NN0029	0.20	0.40	0.05	0.65	2.31	0.00	0.09	4.83	5.50
NN0030	0.21	0.23	0.26	0.21	2.33	0.00	0.01	3.69	4.14
NN0031	0.36	0.34	0.00	0.00	2.20	0.00	0.17	3.96	4.74
NN0032	0.20	1.51	0.00	0.01	1.73	0.00	-0.17	4.16	4.72
NN0033	0.33	0.44	0.00	0.37	3.44	0.00	0.40	5.44	5.94
NN0035	0.25	0.38	0.00	0.00	2.85	0.00	-0.53	4.07	4.71
Average	**0.22**	**0.42**	**0.03**	**0.28**	**2.62**	**0.00**	**-0.09**	**4.45**	**5.13**

Table B5 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
NN0002	0.10	0.21	0.31	0.42	0.38	1.04	2.46	0.44	1.58	4.49
NN0003	0.08	0.09	0.05	0.34	0.57	1.99	3.12	0.22	1.03	4.37
NN0005	0.05	0.08	0.06	0.67	0.10	1.53	2.49	0.34	0.93	3.76
NN0007	0.04	0.10	0.03	0.33	0.06	0.82	1.38	0.25	1.07	2.71
NN0008	0.03	0.06	0.03	0.75	0.14	2.00	3.01	0.31	0.00	3.32
NN0020	0.09	0.18	0.13	1.00	0.13	0.55	2.10	0.69	1.89	4.68
NN0021	0.04	0.23	0.04	0.63	0.10	0.65	1.70	0.76	1.51	3.98
NN0023	0.14	0.15	0.05	0.50	0.29	0.85	1.98	0.30	2.29	4.57
NN0024	0.05	0.13	0.07	0.28	0.17	1.82	2.51	0.29	0.92	3.73
NN0025	0.09	0.13	0.07	0.42	0.13	1.23	2.07	0.59	0.76	3.43
NN0027	0.04	0.08	0.06	0.48	0.10	1.03	1.78	0.29	0.76	2.84
NN0029	0.05	0.08	0.09	0.42	0.07	0.61	1.31	0.27	0.92	2.51
NN0030	0.12	0.09	0.13	0.38	0.44	1.27	2.43	0.50	1.41	4.34
NN0031	0.02	0.05	0.04	0.18	0.02	0.86	1.17	0.32	0.86	2.36
NN0032	0.16	0.01	0.06	0.51	0.20	1.76	2.71	0.20	0.24	3.14
NN0033	0.07	0.08	0.02	0.63	0.24	1.72	2.76	0.47	0.22	3.44
NN0035	0.17	0.02	0.30	0.54	0.04	0.73	1.80	0.60	1.04	3.44
Average	**0.08**	**0.10**	**0.09**	**0.50**	**0.19**	**1.20**	**2.16**	**0.40**	**1.03**	**3.59**

Table B6 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 c osts	% of costs	% of costs	% of costs
NN0002	1.3	1.5	0.0	1.8	2.4	7.0	6.9	1.7	2.4
NN0003	1.7	1.9	0.8	2.8	1.7	8.9	7.4	0.0	7.6
NN0005	1.9	2.7	0.1	1.8	1.8	8.4	10.2	3.5	2.4
NN0007	0.6	1.5	0.1	2.5	2.6	7.4	3.0	7.1	0.8
NN0008	2.6	3.7	0.1	1.1	2.1	9.5	10.4	2.8	5.6
NN0020	0.0	0.6	0.0	3.7	3.5	7.9	2.3	1.1	2.1
NN0021	0.4	2.8	0.2	1.7	1.2	6.3	5.0	3.7	2.8
NN0023	0.6	2.1	0.0	2.6	2.0	7.3	6.0	3.1	2.1
NN0024	0.9	1.9	0.4	1.9	1.4	6.5	4.6	0.7	1.8
NN0025	2.9	2.2	1.3	2.2	1.7	10.4	7.1	2.6	4.5
NN0027	1.7	2.6	0.5	1.8	1.7	8.2	6.8	2.2	0.6
NN0029	2.0	1.7	1.5	2.8	0.5	8.5	8.7	3.7	1.7
NN0030	0.1	1.3	0.7	2.3	1.0	5.2	3.6	0.0	1.7
NN0031	3.2	0.6	2.1	2.4	2.8	11.0	10.0	0.0	2.3
NN0032	1.4	2.4	0.1	1.2	2.0	7.2	7.4	0.1	3.5
NN0033	0.4	1.6	0.3	1.9	1.1	5.4	1.5	0.0	3.6
NN0035	0.2	1.7	1.5	2.7	1.6	7.8	8.8	0.0	4.9
Average	**1.3**	**1.9**	**0.6**	**2.2**	**1.8**	**7.8**	**6.4**	**1.9**	**3.0**

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 c osts	% of costs	% of costs	% of costs
NN0002	3.1	2.9	0.0	0.0	33.0	0.0	-4.3	45.8	52.8
NN0003	2.5	6.9	0.5	1.1	17.5	0.0	-0.5	43.0	51.9
NN0005	1.0	2.4	0.1	4.4	22.1	0.0	3.5	49.8	58.2
NN0007	1.4	3.7	0.0	1.9	38.7	0.5	-1.0	56.1	63.5
NN0008	2.2	5.0	0.0	7.5	26.9	0.0	-3.5	56.8	66.3
NN0020	1.4	1.4	0.0	9.0	33.3	0.0	-0.7	49.9	57.8
NN0021	4.0	3.2	0.0	0.0	34.8	0.0	-1.3	51.4	57.7
NN0023	1.5	2.6	1.1	1.3	22.7	0.0	-0.4	40.1	47.4
NN0024	2.1	4.6	0.0	5.7	36.0	0.0	-2.2	53.3	59.8
NN0025	2.8	5.4	0.1	2.5	26.1	0.0	-4.4	46.7	57.1
NN0027	2.6	4.7	0.6	3.0	38.4	0.0	-2.4	56.5	64.6
NN0029	2.6	5.0	0.6	8.1	28.9	0.0	1.1	60.2	68.7
NN0030	2.5	2.7	3.1	2.4	27.5	0.0	0.1	43.6	48.8
NN0031	5.1	4.8	0.0	0.0	31.0	0.0	2.4	55.7	66.8
NN0032	2.6	19.3	0.0	0.1	22.0	0.0	-2.1	52.9	60.0
NN0033	3.5	4.7	0.0	3.9	36.6	0.0	4.2	58.0	63.3
NN0035	3.1	4.7	0.0	0.0	34.9	0.0	-6.5	50.0	57.8
Average	**2.6**	**4.9**	**0.4**	**3.0**	**30.0**	**0.0**	**-1.1**	**51.2**	**59.0**

Table B7 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
NN0002	1.1	2.2	3.3	4.5	4.0	10.9	25.9	4.7	16.6	47.2
NN0003	0.9	1.0	0.6	3.7	6.3	21.9	34.3	2.4	11.3	48.1
NN0005	0.6	0.9	0.7	7.4	1.2	17.1	27.7	3.7	10.4	41.8
NN0007	0.6	1.4	0.4	4.4	0.8	11.0	18.6	3.4	14.4	36.5
NN0008	0.3	0.6	0.3	7.6	1.4	20.3	30.6	3.1	0.0	33.7
NN0020	0.8	1.7	1.2	9.1	1.2	5.0	19.0	6.3	17.0	42.2
NN0021	0.4	2.5	0.5	6.7	1.1	6.9	18.1	8.1	16.1	42.3
NN0023	1.6	1.7	0.6	5.7	3.3	9.8	22.8	3.5	26.4	52.6
NN0024	0.5	1.4	0.8	3.0	1.8	19.6	27.1	3.2	9.9	40.2
NN0025	1.1	1.6	0.9	5.2	1.7	15.5	26.0	7.4	9.5	42.9
NN0027	0.5	1.0	0.7	5.9	1.3	12.8	22.2	3.6	9.5	35.4
NN0029	0.6	1.0	1.1	5.3	0.8	7.6	16.4	3.4	11.5	31.3
NN0030	1.4	1.1	1.5	4.5	5.1	15.0	28.6	5.9	16.7	51.2
NN0031	0.3	0.7	0.5	2.6	0.3	12.1	16.5	4.6	12.2	33.2
NN0032	2.1	0.1	0.7	6.5	2.6	22.3	34.4	2.5	3.0	40.0
NN0033	0.7	0.9	0.2	6.7	2.5	18.3	29.4	5.0	2.4	36.7
NN0035	2.0	0.3	3.7	6.6	0.4	9.0	22.0	7.4	12.8	42.2
Average	**0.9**	**1.2**	**1.0**	**5.6**	**2.1**	**13.8**	**24.7**	**4.6**	**11.8**	**41.0**

Table B8 Capital structure

Farm assets				
	Land value	Land value	Permanent water value	Permanent water value
	$/ha	$/cow	$/ha	$/cow
Average	16,580	13,227	1,851	1,467

Other farm assets (per usable hectare)				
Plant and equipment	Livestock	Hay and grain	Other assets	Total assets
$/ha	$/ha	$/ha	$/ha	$/ha
1,745	3,010	226	427	22,784

Liabilities	
Liabilities per usable hectare	Liabilities per milking cow
$/ha	$/cow
5,455	4,068

Equity	
Equity per usable hectare	Average equity
$/ha	%
17,971	81

Table B9 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	6.83	7.62	7.46	8.33	0.33	0.37	0.32	0.36	3.34	3.73	4.00	4.46
2013–14	7.17	7.77	8.01	8.68	0.30	0.32	0.37	0.40	3.68	3.99	4.35	4.71
2014–15	7.62	8.14	8.61	9.19	0.35	0.37	0.36	0.38	3.78	4.03	4.48	4.78
2015–16	7.65	8.09	8.46	8.94	0.34	0.36	0.31	0.33	3.61	3.81	4.26	4.50
2016–17	7.28	7.55	8.25	8.56	0.35	0.36	0.31	0.32	3.46	3.59	4.12	4.27
2017–18	7.62	7.74	8.39	8.52	0.38	0.39	0.33	0.33	4.09	4.16	4.79	4.87
2018–19	8.07	8.07	9.16	9.16	0.33	0.33	0.35	0.35	4.45	4.45	5.13	5.13
Average		**7.89**		**8.82**		**0.36**		**0.35**		**3.92**		**4.64**

	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	2.01	2.25	1.26	1.41	3.25	3.63	0.22	0.25	0.58	0.65	-0.36	0.40	0.7	-1.6
2013–14	2.02	2.19	1.34	1.45	3.36	3.64	0.29	0.31	0.64	0.69	-0.34	0.37	0.8	-1.7
2014–15	1.87	1.99	1.45	1.55	3.31	3.53	0.82	0.88	0.63	0.67	0.19	0.20	1.9	0.4
2015–16	1.96	2.08	1.62	1.71	3.58	3.78	0.62	0.66	0.53	0.56	0.09	0.10	1.6	-0.1
2016–17	1.92	1.99	1.46	1.51	3.38	3.51	0.75	0.78	0.52	0.54	0.23	0.24	1.8	0.8
2017–18	1.86	1.89	1.61	1.64	3.46	3.52	0.13	0.13	0.46	0.47	-0.33	0.34	0.5	-1.0
2018–19	2.16	2.16	1.43	1.43	3.59	3.59	0.43	0.43	0.47	0.47	-0.04	0.04	1.1	0.2
Average		**2.07**		**1.54**		**3.61**		**0.58**		**0.57**		**0.01**	**1.4**	**-0.1**

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 B10 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	335	130	0.49	361	1.3	460	615	7.4	1.4	59	335	374
2013–14	231	102	0.59	272	1.2	471	590	5.8	1.2	60	444	481
2014–15	215	95	0.48	259	1.3	477	606	6.4	1.8	59	434	463
2015–16	210	95	0.53	289	1.4	463	636	5.9	2.3	52	401	424
2016–17	188	88	0.49	259	1.4	477	680	7.2	1.5	62	376	390
2017–18	188	94	0.60	288	1.5	459	698	7.1	1.6	57	442	449
2018–19	299	108	0.68	328	1.3	443	580	7.2	2.0	64	581	581
Average	**240**	**103**	**0.54**	**295**	**1.4**	**464**	**625.4**	**6.6**	**1.7**	**59**		**439**

*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 C South summary tables

Table C1 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	%
SN0002	7.87	1.50	9.37	6.61	3.15	68	-0.38	-0.6	0.76	8.1	-1.14	-3.4
SN0006	7.66	1.09	8.75	4.05	2.59	61	2.11	5.9	0.83	9.4	1.28	8.6
SN0009	6.86	1.24	8.09	7.29	3.22	69	-2.41	-3.1	1.25	15.4	-3.65	-6.7
SN0014	6.04	0.58	6.63	6.64	1.91	78	-1.92	-8.6	0.51	7.7	-2.44	-21.1
SN0016	7.35	0.39	7.73	3.98	3.48	53	0.28	0.9	0.34	4.4	-0.06	-0.3
SN0017	7.35	0.59	7.93	3.51	3.51	50	0.91	1.7	0.04	0.5	0.87	1.7
SN0021	6.46	0.23	6.69	6.01	2.04	75	-1.36	-5.0	0.00	0.0	-1.36	-5.0
SN0023	6.78	0.74	7.52	5.32	2.34	69	-0.14	-0.6	0.22	2.9	-0.36	-2.0
SN0024	7.91	1.00	8.91	5.01	2.50	67	1.40	2.1	0.97	10.9	0.43	3.6
SN0025	7.64	0.55	8.19	3.46	2.96	54	1.76	3.1	0.52	6.4	1.24	2.8
SN0026	7.88	0.02	7.90	5.11	2.56	67	0.22	0.7	1.28	16.1	-1.05	-13.5
SN0028	6.42	0.16	6.57	5.40	1.42	79	-0.25	-1.3	0.17	2.5	-0.42	-2.9
SN0029	8.07	2.19	10.26	5.37	3.39	61	1.50	3.3	0.69	6.8	0.81	2.6
SN0031	8.37	0.55	8.92	5.11	3.07	62	0.74	1.7	0.71	8.0	0.02	0.1
SN0032	7.86	0.83	8.69	3.56	2.96	55	2.17	4.8	0.89	10.2	1.28	4.5
Average	**7.37**	**0.78**	**8.14**	**5.10**	**2.74**	**65**	**0.31**	**0.3**	**0.61**	**7.3**	**-0.30**	**-2.1**

Table C2 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	%	%
SN0002	199	95	0.2	320	1.6	548	880	3.8	3.3
SN0006	223	71	1.0	330	1.5	491	727	3.9	3.2
SN0009	280	10	0.2	280	1.0	400	400	4.0	3.3
SN0014	550	185	0.7	365	0.7	614	408	4.1	3.3
SN0016	510	277	0.7	420	0.8	503	414	4.1	3.3
SN0017	184	75	0.5	140	0.8	523	399	4.1	3.4
SN0021	1033	434	0.5	1290	1.2	498	622	5.1	3.8
SN0023	110	82	1.2	165	1.5	524	787	3.9	3.4
SN0024	224	134	0.6	260	1.2	465	540	3.8	3.2
SN0025	172	56	1.6	280	1.6	513	836	3.9	3.2
SN0026	185	88	0.9	300	1.6	577	935	5.2	3.9
SN0028	882	882	0.9	970	1.1	643	707	4.3	3.4
SN0029	372	1	1.2	360	1.0	851	825	3.6	3.0
SN0031	655	250	0.6	450	0.7	535	368	4.0	3.2
SN0032	270	115	1.0	430	1.6	504	803	3.8	3.3
Average	**390**	**184**	**0.8**	**424**	**1.2**	**546**	**643**	**4.1**	**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
SN0002	4.63	0.46	19	118	0	0	0	70	38,088
SN0006	8.27	0.15	59	64	4	8	3	96	47,069
SN0009	0.03	0.00	26	25	6	0	1	73	29,125
SN0014	3.82	0.51	64	90	13	1	3	106	64,875
SN0016	3.60	0.69	56	29	4	2	0	57	28,746
SN0017	3.16	2.00	60	28	3	9	0	58	30,110
SN0021	5.63	0.00	74	200	46	35	7	129	64,355
SN0023	6.15	2.13	62	197	44	0	55	84	44,050
SN0024	5.51	1.55	58	105	10	0	1	94	43,684
SN0025	12.35	0.00	77	50	10	44	1	94	48,074
SN0026	9.50	3.99	59	156	7	9	5	76	44,094
SN0028	1.63	2.31	44	85	17	3	9	109	70,162
SN0029	0.02	0.00	55	74	9	1	1	45	38,195
SN0031	4.46	2.82	60	101	13	35	11	59	31,623
SN0032	10.15	0.47	61	128	16	32	12	93	46,935
Average	**5.26**	**1.56**	**56**	**96**	**14**	**12**	**7**	**83**	**44,612**

*on milking area

Table C3 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
SN0002	4.65	494.8	0.0	355.3	0.0	461.2	81
SN0006	2.54	528.4	0.0	367.1	0.0	512.6	41
SN0009	4.74	497.9	0.0	189.4	669.9	345.7	74
SN0014	2.45	526.4	0.0	450.3	0.0	513.1	36
SN0016	3.35	448.7	236.7	519.7	0.0	440.2	44
SN0017	2.52	593.3	0.0	0.0	0.0	593.3	40
SN0021	1.15	481.1	0.0	0.0	390.7	474.4	26
SN0023	1.76	617.2	0.0	390.8	0.0	538.7	38
SN0024	2.21	554.1	0.0	577.1	0.0	546.6	42
SN0025	1.65	659.8	0.0	354.5	0.0	545.1	23
SN0026	2.11	664.9	0.0	323.0	383.8	562.4	41
SN0028	4.63	527.8	277.0	243.8	198.8	398.0	56
SN0029	4.49	549.9	0.0	0.0	348.5	537.0	45
SN0031	2.45	563.9	462.9	403.1	0.0	504.3	40
SN0032	2.21	571.3	0.0	517.6	149.6	372.2	39
Average	**2.9**	**552.0**	**325.5**	**391.0**	**356.9**	**489.7**	**44**

Table C4 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
SN0002	0.09	0.15	0.16	0.08	0.15	0.63	0.26	0.08	0.06
SN0006	0.09	0.21	0.01	0.11	0.15	0.56	0.46	0.11	0.17
SN0009	0.04	0.09	0.03	0.22	0.17	0.55	0.15	0.02	0.11
SN0014	0.11	0.16	0.01	0.09	0.08	0.44	0.57	1.77	0.28
SN0016	0.12	0.14	0.03	0.09	0.10	0.48	0.16	0.09	0.06
SN0017	0.08	0.09	0.06	0.12	0.07	0.42	0.19	0.07	0.32
SN0021	0.08	0.09	0.00	0.12	0.05	0.34	0.53	1.69	0.15
SN0023	0.06	0.01	0.00	0.14	0.13	0.35	0.64	0.22	0.46
SN0024	0.22	0.18	0.08	0.11	0.07	0.66	0.44	0.00	0.21
SN0025	0.10	0.18	0.11	0.21	0.11	0.71	0.28	0.00	0.30
SN0026	0.15	0.12	0.06	0.28	0.07	0.68	0.30	0.51	0.20
SN0028	0.11	0.12	0.01	0.09	0.06	0.40	0.25	0.61	0.28
SN0029	0.13	0.23	0.00	0.19	0.34	0.90	0.24	0.33	0.45
SN0031	0.06	0.17	0.01	0.06	0.05	0.36	0.59	0.69	0.31
SN0032	0.19	0.27	0.05	0.16	0.21	0.87	0.23	0.02	0.16
Average	**0.11**	**0.15**	**0.04**	**0.14**	**0.12**	**0.56**	**0.35**	**0.41**	**0.23**

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
SN0002	0.14	0.14	0.01	0.87	4.13	0.07	0.21	5.98	6.61
SN0006	0.21	0.27	0.06	0.19	2.51	0.25	-0.74	3.49	4.05
SN0009	0.45	0.34	0.00	1.42	3.80	0.00	0.37	6.73	7.29
SN0014	0.14	0.35	0.00	0.33	1.80	0.03	0.23	6.20	6.64
SN0016	0.12	0.17	0.00	0.97	2.09	0.00	-0.17	3.50	3.98
SN0017	0.10	0.17	0.00	0.00	3.01	0.00	-0.75	3.10	3.51
SN0021	0.15	0.35	0.04	0.00	1.39	0.02	1.31	5.67	6.01
SN0023	0.10	0.31	0.05	0.74	2.22	0.47	-0.22	4.97	5.32
SN0024	0.08	0.33	0.00	0.40	2.68	0.40	-0.20	4.35	5.01
SN0025	0.22	0.28	0.00	0.53	1.65	0.01	-0.53	2.75	3.46
SN0026	0.26	0.29	0.04	0.18	2.48	0.00	0.16	4.43	5.11
SN0028	0.11	0.26	0.03	1.02	2.14	0.00	-0.07	5.01	5.40
SN0029	0.18	0.39	0.00	0.00	2.88	0.00	0.00	4.47	5.37
SN0031	0.22	0.46	0.00	1.12	1.75	0.00	-0.28	4.75	5.11
SN0032	0.13	0.43	0.00	0.08	2.11	0.00	-0.47	2.68	3.56
Average	**0.17**	**0.30**	**0.02**	**0.52**	**2.44**	**0.08**	**-0.08**	**4.54**	**5.10**

Table C5 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
SN0002	0.08	0.10	0.07	0.53	0.10	0.20	1.08	0.41	1.66	3.15
SN0006	0.02	0.13	0.04	0.34	0.15	1.04	1.73	0.50	0.36	2.59
SN0009	0.07	0.12	0.17	0.30	0.19	0.83	1.68	0.41	1.13	3.22
SN0014	0.02	0.08	0.04	0.23	0.19	0.51	1.08	0.26	0.57	1.91
SN0016	0.07	0.10	0.14	0.20	0.07	1.17	1.76	0.35	1.36	3.48
SN0017	0.12	0.11	0.02	0.25	0.10	1.59	2.18	0.34	0.99	3.51
SN0021	0.03	0.06	0.01	0.38	0.10	0.90	1.48	0.29	0.27	2.04
SN0023	0.03	0.12	0.05	0.39	0.12	0.19	0.90	0.08	1.36	2.34
SN0024	0.19	0.07	0.05	0.28	0.13	0.71	1.42	0.23	0.84	2.50
SN0025	0.08	0.16	0.10	0.35	0.14	0.22	1.05	0.65	1.27	2.96
SN0026	0.02	0.12	0.02	0.37	0.11	0.82	1.46	0.51	0.60	2.56
SN0028	0.01	0.07	0.01	0.31	0.05	0.83	1.27	0.12	0.03	1.42
SN0029	0.03	0.09	0.03	0.69	0.14	1.72	2.70	0.35	0.33	3.39
SN0031	0.03	0.08	0.02	0.38	0.13	0.91	1.56	0.40	1.11	3.07
SN0032	0.11	0.19	0.04	0.76	0.05	0.78	1.94	0.38	0.65	2.96
Average	**0.06**	**0.11**	**0.05**	**0.38**	**0.12**	**0.83**	**1.55**	**0.35**	**0.84**	**2.74**

Table C6 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
SN0002	1.0	1.5	1.6	0.9	1.5	6.5	2.7	0.8	0.7
SN0006	1.3	3.1	0.1	1.7	2.3	8.5	6.9	1.7	2.6
SN0009	0.4	0.9	0.3	2.1	1.6	5.3	1.4	0.2	1.0
SN0014	1.3	1.8	0.1	1.0	0.9	5.1	6.7	20.7	3.3
SN0016	1.7	1.9	0.4	1.2	1.3	6.5	2.2	1.2	0.8
SN0017	1.1	1.2	0.9	1.7	1.0	6.0	2.7	0.9	4.5
SN0021	1.0	1.1	0.0	1.5	0.6	4.3	6.6	21.0	1.9
SN0023	0.8	0.1	0.0	1.9	1.8	4.6	8.4	2.8	5.9
SN0024	3.0	2.4	1.0	1.5	1.0	8.8	5.8	0.0	2.8
SN0025	1.5	2.9	1.7	3.2	1.7	11.0	4.3	0.0	4.7
SN0026	2.0	1.6	0.8	3.6	0.9	8.9	3.9	6.7	2.6
SN0028	1.6	1.8	0.2	1.4	0.8	5.8	3.7	8.9	4.0
SN0029	1.5	2.7	0.0	2.2	3.9	10.3	2.7	3.8	5.1
SN0031	0.8	2.1	0.2	0.7	0.6	4.4	7.2	8.4	3.8
SN0032	2.9	4.1	0.7	2.4	3.3	13.4	3.5	0.4	2.5
Average	**1.4**	**2.0**	**0.5**	**1.8**	**1.5**	**7.3**	**4.6**	**5.2**	**3.1**

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
SN0002	1.5	1.5	0.1	8.9	42.3	0.7	2.2	61.3	67.7
SN0006	3.2	4.0	0.9	2.8	37.8	3.7	-11.1	52.5	61.0
SN0009	4.3	3.3	0.0	13.6	36.2	0.0	3.5	64.1	69.4
SN0014	1.6	4.1	0.0	3.8	21.0	0.4	2.7	72.5	77.6
SN0016	1.6	2.3	0.0	13.0	28.0	0.0	-2.2	46.9	53.3
SN0017	1.4	2.5	0.0	0.0	42.8	0.0	-10.8	44.1	50.1
SN0021	1.9	4.3	0.5	0.0	17.2	0.2	16.3	70.4	74.7
SN0023	1.3	4.0	0.6	9.7	28.9	6.1	-2.8	64.9	69.4
SN0024	1.1	4.5	0.0	5.3	35.8	5.4	-2.7	58.0	66.7
SN0025	3.4	4.4	0.0	8.3	25.7	0.1	-8.3	42.8	53.8
SN0026	3.4	3.8	0.6	2.3	32.4	0.0	2.0	57.7	66.6
SN0028	1.6	3.8	0.5	14.9	31.3	0.0	-1.1	73.4	79.2
SN0029	2.0	4.5	0.0	0.0	32.9	0.0	0.0	51.0	61.3
SN0031	2.7	5.6	0.0	13.7	21.4	0.0	-3.4	58.1	62.5
SN0032	2.0	6.5	0.0	1.2	32.4	0.0	-7.3	41.1	54.5
Average	**2.2**	**3.9**	**0.2**	**6.5**	**31.1**	**1.1**	**-1.5**	**57.2**	**64.5**

Table C7 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
SN0002	0.8	1.0	0.7	5.4	1.0	2.1	11.0	4.2	17.0	32.3
SN0006	0.3	2.0	0.6	5.2	2.3	15.6	26.0	7.6	5.4	39.0
SN0009	0.7	1.1	1.6	2.9	1.8	7.9	16.0	3.9	10.7	30.6
SN0014	0.3	1.0	0.5	2.7	2.2	6.0	12.7	3.0	6.6	22.4
SN0016	0.9	1.4	1.9	2.7	1.0	15.7	23.6	4.8	18.3	46.7
SN0017	1.7	1.5	0.3	3.6	1.4	22.6	31.0	4.8	14.2	49.9
SN0021	0.3	0.7	0.2	4.7	1.3	11.2	18.4	3.6	3.3	25.3
SN0023	0.5	1.5	0.7	5.1	1.6	2.4	11.8	1.1	17.7	30.6
SN0024	2.6	1.0	0.6	3.7	1.7	9.4	19.0	3.1	11.2	33.3
SN0025	1.2	2.5	1.5	5.5	2.2	3.4	16.3	10.1	19.7	46.2
SN0026	0.3	1.5	0.3	4.8	1.5	10.7	19.0	6.6	7.8	33.4
SN0028	0.2	1.0	0.1	4.5	0.7	12.2	18.6	1.7	0.5	20.8
SN0029	0.3	1.1	0.4	7.8	1.6	19.6	30.9	4.0	3.8	38.7
SN0031	0.3	1.0	0.3	4.7	1.6	11.1	19.1	4.9	13.5	37.5
SN0032	1.7	3.0	0.6	11.6	0.8	12.0	29.7	5.8	10.0	45.5
Average	**0.8**	**1.4**	**0.7**	**5.0**	**1.5**	**10.8**	**20.2**	**4.6**	**10.7**	**35.5**

Table C8 Capital structure

Farm assets				
	Land value	Land value	Permanent water value	Permanent water value
	$/ha	$/cow	$/ha	$/cow
Average	16,279	13,432	2,776	2,752

Other farm assets (per usable hectare)				
Plant and equipment	Livestock	Hay and grain	Other assets	Total assets
$/ha	$/ha	$/ha	$/ha	$/ha
1,672	2,897	448	752	23,888

Liabilities		
	Liabilities per usable hectare	Liabilities per milking cow
	$/ha	$/cow
Average	8,069	6,463

Equity	
Equity per usable hectare	Average equity
$/ha	%
16,357	70

Table C9 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	6.03	6.73	6.95	7.76	0.32	0.36	0.24	0.27	3.01	3.36	3.57	3.98
2013–14	7.12	7.71	7.98	8.65	0.32	0.34	0.21	0.23	3.20	3.47	3.73	4.04
2014–15	7.28	7.77	8.25	8.81	0.30	0.32	0.21	0.23	3.28	3.50	3.79	4.05
2015–16	6.97	7.37	7.94	8.39	0.35	0.37	0.21	0.22	3.01	3.18	3.57	3.77
2016–17	6.48	6.73	7.62	7.90	0.40	0.42	0.22	0.22	3.07	3.18	3.68	3.82
2017–18	6.81	6.92	7.49	7.61	0.34	0.35	0.23	0.23	3.63	3.69	4.20	4.27
2018–19	7.37	7.37	8.14	8.14	0.30	0.30	0.26	0.26	4.54	4.54	5.10	5.10
Average		**7.27**		**8.23**		**0.35**		**0.24**		**3.52**		**4.12**

	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	1.44	1.61	1.12	1.25	2.56	2.86	0.82	0.92	0.66	0.73	0.16	0.18	2.7	0.5
2013–14	1.54	1.67	1.16	1.26	2.70	2.93	1.55	1.68	0.61	0.66	0.94	1.02	4.8	4.7
2014–15	1.52	1.62	1.02	1.09	2.54	2.71	1.92	2.05	0.56	0.59	1.36	1.46	5.3	5.7
2015–16	1.49	1.57	1.17	1.24	2.66	2.81	1.71	1.81	0.55	0.58	1.16	1.23	4.7	4.7
2016–17	1.67	1.73	1.16	1.20	2.83	2.94	1.11	1.15	0.51	0.53	0.60	0.62	2.7	2.1
2017–18	1.49	1.51	1.22	1.24	2.71	2.75	0.58	0.59	0.58	0.59	0.00	0.00	2.1	0.6
2018–19	1.55	1.55	1.19	1.19	2.74	2.74	0.31	0.31	0.61	0.61	-0.30	0.30	0.3	-2.1
Average		**1.60**		**1.21**		**2.81**		**1.30**		**0.64**		**0.66**	**3.5**	**2.6**

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 C10 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	323	151	0.61	337	1.1	523	601	6.5	1.2	55	311	347
2013–14	381	139	0.60	350	1.0	541	546	6.2	1.0	54	377	409
2014–15	372	165	0.56	430	1.1	540	597	6.7	1.8	57	389	415
2015–16	379	164	0.57	425	1.1	552	597	6.5	1.9	57	382	404
2016–17	343	153	0.63	396	1.2	520	611	6.5	1.7	57	336	349
2017–18	333	149	0.75	401	1.3	526	665	5.6	1.6	55	398	404
2018–19	390	184	0.80	424	1.2	546	643	5.3	1.6	56	552	552
Average	**359**	**157**	**0.63**	**402**	**1.2**	**530**	**624**	**6.3**	**1.5**	**55**		**403**

*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 D 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 2018–19 the imputed owner/operator and family labour rate was $30.33/hr based on a full time equivalent (FTE) working 48 hours/week for 50 weeks of the year. The imputed labour rate was increased from $67,200/FTE in 2016–17 to $72,800/FTE in 2017–18.

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