Dairy Farm Monitor Project

New South Wales | Annual Report 2017–18

Acknowledgements

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This report has been produced by Kerry Kempton, in conjunction with Dairy Australia.

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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;
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› Farm monitor method
› Statewide overview
› North region overview
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› Business confidence survey
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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 2017–18 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 18 participating farms in the northern NSW region are referred to as 'North'.
› The 14 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 2016–17 Dairy Farm Monitor Project report. Price and cost comparisons between years are nominal unless otherwise stated. It should be noted that not all of the participants from 2016–17 are in the 2017–18 report, 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 2017–18?

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

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

› Within the overhead cost category, registration and insurance have now been separated into farm insurance and motor vehicle expenses. Farm insurance relates to all farm insurance that is not personal, such as death and total and permanent disability (TPD). Motor vehicle expenses include registration, insurance, fuel and repairs on vehicles.

› Return on assets is now referred to as return on total assets.

› Water use previously reported as mm/ha is now reported as total water use efficiency (t DM/100mm/ ha). Total water use efficiency estimates the amount of home grown feed produced from rainfall and irrigation applied across the usable area. This calculation aligns with DairyBase and the Dairy Moving Forward Feedbase targets.

› Australia's dairy industry greenhouse gas emissions calculator, the national greenhouse gas inventory (NGGI), was used in conjunction with the physical and financial data provided by participant farms. The NGGI emissions calculator is now embedded within DairyBase resulting in some small differences with data entry, and care should be taken when comparing between calculators.

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

In 2017–18 data collected and analysed from 32 farms across New South Wales revealed that farm business profit decreased to the lowest level in the seven year life of the project. Although milk prices increased by 5%, feed costs increased by 19% on average, due mainly to the impact of the widespread drought in NSW. Rainfall was very much below average across all regions of NSW, and combined with record warm temperatures made for a very difficult season for dairy farmers.

Despite the NSW dairy industry experiencing difficult seasonal conditions in 2017–18, state milk production remained similar to the previous year at 1.13 billion litres (Source: Dairy Australia).

For the farmers participating in the Dairy Farm Monitor Project, milk price in 2017–18 increased on average by 5.5% on the previous year, up from $6.89 to $7.27/kg MS (54 cents/litre).

Seasonal conditions in 2017–18 were characterised by a very dry spring, followed by an average summer for rainfall, which led into a very dry autumn and winter. By June 2018, 99% of NSW was in drought, with many regions in prolonged severe drought.

The dry season was reflected in a lower amount of grazed pasture consumed and fodder conserved on farms. Estimated grazed pasture decreased from 6.9 t DM/ha to 6.0 t DM/ha, on the milking area. Farmers relied on more purchased fodder than previous years, with bought in feed increasing from 41% to 44% of metabolisable energy consumed in 2017–18.

A market shortage of fodder and grain emerged in winter and dairy farmers had to compete with other drought affected livestock industries for dwindling local supplies. This saw prices increase to very high levels as fodder and grain were purchased from interstate.

Farm profit declined this year compared to 2016–17. The average earnings before interest and tax (EBIT) was $0.33/kg MS (2.5 c/l), which was a 64% decrease from the previous year.

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

Across the North, most farms experienced dry conditions in spring and summer, before some good rain in April, followed by more dry conditions for the remainder of the year. Milk prices on average increased by 5% to $7.62/kg MS (57 c/l).

The average cost of production (including inventory change) was 12% higher than the year before, at $8.38/kg MS (62 c/l) for the North. Farms fed a similar amount of concentrate per cow but paid more for it, with the price of concentrates averaging $442 per tonne of dry matter (t DM). Participant farmers fed more hay, and the average price paid by those who purchased hay was $372/t DM.

Largely due to the increase in feed costs, average whole farm earnings before interest and tax (EBIT) decreased to $39,802 per farm, compared to $104,143 in 2016–17. Average return on total assets decreased from 1.8% in 2016–17 to 0.5% in 2017–18.

The South

Most of the southern region also experienced drier seasonal conditions throughout 2017–18, although they had close to average rainfall throughout spring and summer.

Milk prices increased by around 5% over the previous year to $6.81/kg MS. Cost of production increased by 6% in 2017–18, mainly due to higher prices for purchased feed. Overall this led to a large decrease in EBIT to an average of $141,549 per farm this year, down by 33% on the previous year. Average return on total assets for the group decreased to 2.1%, down from 2.7% in 2016–17.

Farmer confidence

Following another year of lower profits in 2017–18, expectations about improving business profit for the coming season were down, with 35% of farmers expecting an improvement, and 65% expecting a deterioration or no change.

Intentions for increasing milk production next year were neutral in the North at 50%, and negative in the South at 27%, indicating a decline in farmer confidence about the year ahead.

The major concerns facing participants for 2018/19 were related to input costs and seasonal conditions 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 seven years of the project showed that 2017–18 continued the trend of the previous two years with lower EBIT per farm and diminishing return on total assets and equity.

This chapter explains the method used in the Dairy Farm Monitor Project (DFMP) and defines the key terms used. The profit and production 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 provides industry with the same standardised method and terms for farm financial reporting as used in DFMP.

The DFMP method is presented as a profit map in Figure 1, which shows how the farm business economic indicators are calculated. This profit map is also a summary of the average performance of all the project participants in 2017–18.

The diagram shows the different profit measures, as costs are 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 the maximisation of income and minimisation of 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. The main source of income is from milk solids sold.

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

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

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.

The return on equity including capital appreciation is reported in Appendix Table 1 for each region.

Figure 1 Dairy Farm Monitor Project method profit map – state average 2017–18 data

Total cows
337

Milk solids sold
166,211 kg MS

×

Price per unit
$7.27/kg MS

Milk solids sold
488 kg MS/cow

Milk income (net)
$1,178,813

Livestock trading profit
$105,080

Other income

All other income
$13,888

Gross farm income
$1,297,781

Herd costs
$57,860

Shed costs
$42,792

Variable costs

Feed costs (including feed
and water inventory change)
$638,266

Gross margin
$558,863

Cash overheads
$269,093

Overheads

Imputed labour costs
$143,789

Depreciation
$61,665

Earnings before interest
and tax (EBIT)
$84,316

Interest and lease costs

Interest and lease costs
$76,804

Net farm income
$7,512

Assets leased
$667,722

Equity
$4,128,480
77%

Liabilities
$1,180,397

Assets owned
$5,308,878

Assets managed
$5,976,600

Return on total assets
1.2%

Return on equity
-0.3%

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 the South regions.

NSW produces 12% of Australia's national milk supply, a total of 1.13 billion litres in 2017–18 from 660 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 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.

Figure 2 Distribution of participant farms in 2017–18 across NSW

Seasonal conditions

NSW rainfall for the year was well below average, with conditions deteriorating as the year progressed. By June 2018, 99% of NSW was in drought, with many regions experiencing record low rainfall. Spring of 2017 was very dry, limiting pasture growth and cereal crop yields. The summer produced average rainfall for most regions, however the drought really began to impact most regions from March or April 2018.

The lack of fodder conservation in spring, followed by the dry autumn and winter, meant many dairy farmers had to buy in fodder in much larger quantities this year than in an average year.

The regional sections provide more detail on the 2017–18 seasonal conditions. Figure 3 shows the average monthly rainfall pattern in 2017–18 for the participating farms, and the differences between the regions.

Figure 3 2017–18 monthly rainfall
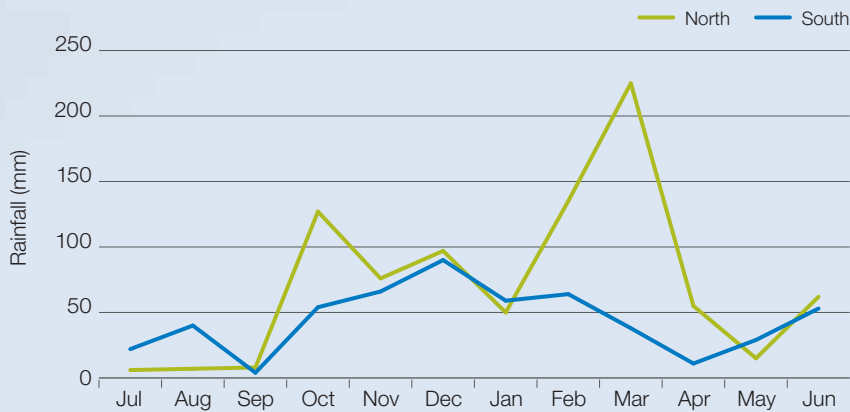
Whole farm analysis

2017–18 was a challenging year for participant farms in NSW due to very dry conditions experienced for a large part of the year. The seasonal conditions were characterised by low rainfall in spring, autumn and winter. This led to reduced home grown feed consumed and an increased requirement for purchased feed.

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.

There were five new farms in the project this year (three in the North and two in the South), and there were eight who chose not to participate, to leave the sample size at 32 farms.

Average herd size increased across the state this year to 337 cows, up from an average of 326 cows last year. This was due mainly to the North farms increasing by an average of 29 cows milked, influenced by the change in sample farms.

The average rainfall across the state was 30% lower than the previous year, particularly in the South which experienced 35% reduction in average rainfall.

Milk solids (MS) sold per cow was lower in the North, down from 477 to 459 kg per cow. However it was slightly higher in the South, up by 6 kg to 526 kg per cow. Stocking rate per usable hectare was higher in both regions, and milk sold (kg MS/ha) increased, up from 646 kg MS/ha to 683 kg MS/ha. Labour efficiency in kilogram of milk solids produced per full time equivalent person increased on the South farms, and remained the same on North farms.

Farmers had less feed available from home grown sources due to reduced pasture growth, hence they used up home grown feed storages and imported more feed. This led to an increase in costs for their businesses this year both through direct feed costs and the use of feed inventories.

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 5.5% increase in milk price. The average milk price across all participants was $7.27/kg MS (54 cents/litre), up from $6.89/kg MS last year. Average milk price in the North this year was $7.62/kg MS (56.5 c/l) and in the South it was $6.81/kg MS (50.6 c/l).

Milk income accounted for 90% of gross farm income, with income from livestock trading profit lower at $0.62/kg MS in 2017–18, compared to $0.90/kg MS in the previous year.

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 $2.66/kg MS (18.7 c/l), which is 35% higher than the previous year ($1.97/kg MS). This is a combination of a higher amount of purchased feed, plus an increase in cost per tonne of concentrates and fodder, and 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 $3.89/kg MS, and accounted for 50% of total costs (variable plus overhead costs) on average for the state. This was the highest feed cost in the seven years of the project.

Table 1 Farm physical data – state overview

Farm physical parameters	Statewide	North	South
Number of farms in sample	32	18	14
Herd size (no. cows milked for at least 3 months)	337	288	401
Annual rainfall 17–18 (mm)	718	864	530
Total water use efficiency (t DM/100mm/ha)	0.6	0.6	0.8
Total usable area (ha)	251	188	333
Stocking rate (cows per usable hectare)	1.4	1.5	1.3
Milk sold (kg MS/cow)	488	459	526
Milk sold (kg MS/ha)	683	698	665
Home grown feed as a % of ME consumed	56	57	55
Labour efficiency (cow/FTE)	77	70	85
People productivity (kg MS/FTE)	37,536	32,110	44,513

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 $3.46/kg MS, which was lower than the previous year ($4.03/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.

The imputed labour rate this year is calculated as $30.33 per hour to better reflect market conditions. Further information on imputed labour can be found in Appendix D.

Average overhead costs this year were similar to last year, at $3.13/kg MS (23 c/l). An increase in the value of imputed labour was offset by lower employed labour and repairs and maintenance costs.

Table 2 shows that in 2017–18 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.

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)	7.27	53.9	7.62	56.5	6.81	50.6
Livestock trading profit	0.62	4.6	0.62	4.5	0.63	4.7
Other farm income	0.11	0.8	0.15	1.1	0.05	0.4
Total income	**8.00**	**59.3**	**8.39**	**62.1**	**7.49**	**55.7**
Variable costs						
Herd cost	0.36	2.7	0.38	2.8	0.34	2.5
Shed cost	0.28	2.1	0.33	2.4	0.23	1.7
Home grown feed cost	1.23	8.5	1.35	10.0	1.09	8.3
Purchased feed and agistment	2.66	18.7	2.76	19.5	2.53	17.7
Feed inventory change	-0.01	0.0	-0.03	-0.2	0.01	0.2
Water inventory change	0.00	0.0	0.00	0.0	0.01	0.1
Total feed costs	**3.89**	**28.8**	**4.09**	**30.2**	**3.63**	**27.1**
Total variable costs	**4.53**	**33.6**	**4.79**	**35.4**	**4.20**	**31.3**
Gross margin	**3.46**	**25.7**	**3.60**	**26.7**	**3.29**	**24.4**
Overhead costs						
Employed labour	0.86	6.4	0.94	6.9	0.76	5.8
Repairs and maintenance	0.43	3.2	0.48	3.5	0.36	2.7
All other overheads	0.41	3.0	0.44	3.2	0.37	2.7
Imputed labour	1.05	7.8	1.22	9.1	0.84	6.2
Depreciation	0.38	2.9	0.39	2.9	0.38	2.8
Total overhead costs	**3.13**	**23.2**	**3.46**	**25.6**	**2.71**	**20.2**
Variable and overhead costs	**7.67**	**56.8**	**8.26**	**61.0**	**6.91**	**51.5**
Earnings before interest and tax	**0.33**	**2.5**	**0.13**	**1.1**	**0.58**	**4.2**

Average EBIT was 64% lower across the state this year at $0.33/ kg MS (2.5 c/l) compared to $0.92/ kg MS (6.8 c/l) in 2016–17. This significant decrease in EBIT was influenced by a huge 82% drop in the North region, down from $0.75/kg MS to just $0.13/kg MS. Participant farms in the South also had a 47% decrease in EBIT, down from $1.10/kg MS to $0.58/kg MS.

This decline in EBIT across the regions, despite a 5.5% 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 2017–18. The RoTA was 1.2%, down from 2.2% last year.

Figure 5 shows the majority of farms had a RoTA between 0% and 5%. The participant farms ranged from negative 5.5% to 7.1%, with 20 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 0.3%, a decrease from the 1.4% RoE received by participants last year. The range in RoE for the State was negative 12.3% to 10.1% this year, with only 15 of the 32 farms recording a positive RoE (Figure 6).

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.

Figure 4 Average earnings before interest and tax per kilogram of milk solids sold
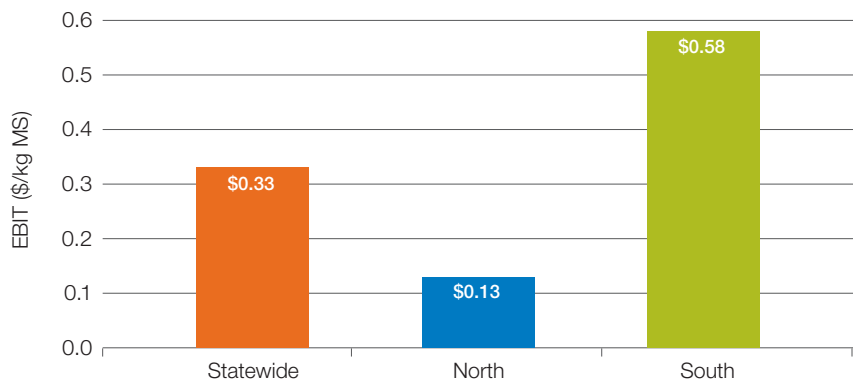

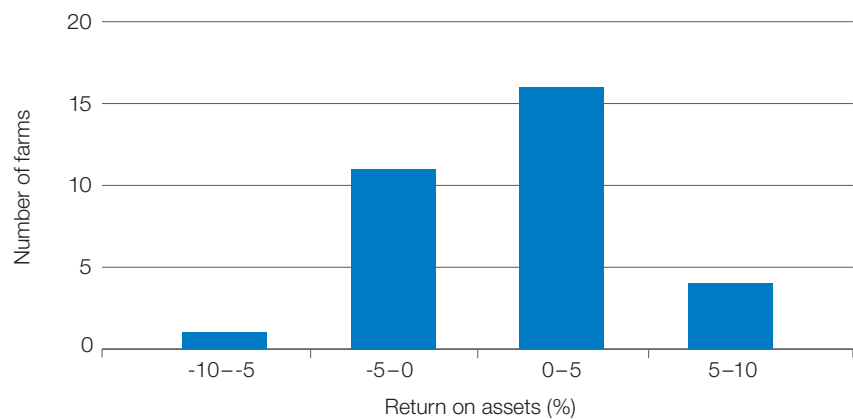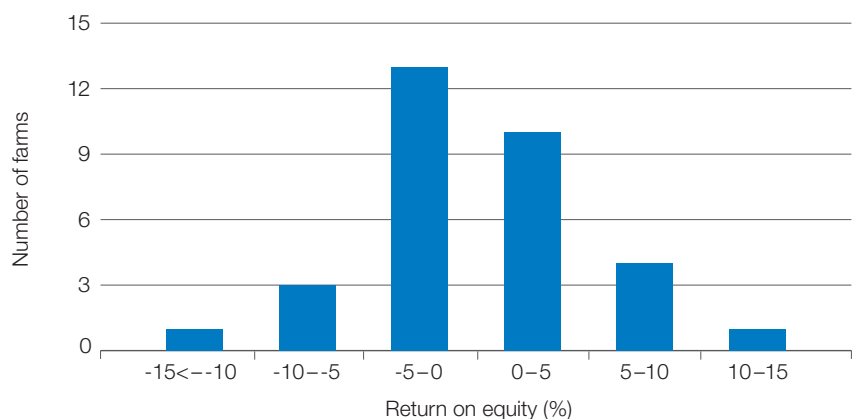**Figure 5** Distribution of farms by return on total assets

Figure 6 Distribution of farms by return on equity

Risk

"Risk is conventionally classified into two types: business risk and financial risk. Business risk is the risk any business faces regardless of how it is financed. It comes from production and price risk, uncertainty and variability. Business risk refers to variable yields of crops, reproduction rates, disease outbreaks, climatic variability, unexpected changes in markets and prices, fluctuations in inflation and interest rates, and personal mishap. Financial risk derives from the proportion of other people's money that is used in the business relative to the proportion of owner-operator's capital." [1]

Table 3 presents some key business risk and financial 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.

All farms are exposed to business and financial risk. It is through managing risk that greater profits can be made. It is also the case that by accepting a level of risk in one area of business, a greater risk in another area can be avoided.

Using the example of feed sources, dairy farmers are generally better at dairy farming than they are at grain production. Thus by allowing someone who is experienced in producing grain to supply them, they lessen the production and other business risks as well as the financial risks they would have exposed themselves to by including extensive cropping in their own business. The trade-off is that they are in turn exposed to price and supply risks.

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

The higher the risk indicator (or lower equity %) in Table 3, the greater the exposure to the risk of a shock in those areas of the business. Further, the data in Appendix Tables 4 and 5 are in cost per kilograms of milk solids sold. This data set is best used as risk indicators, given it is measured against the product produced and sold currently and not the capital invested.

The cost structure ratio provides variable costs as a 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, $0.59 was used to cover variable costs, however it is worth noting that cost structure varies between regions and farms. One hundred minus this percentage gives the proportion of total costs that are overhead costs.

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 an decrease in average equity levels across the state, with an average of 77% compared to 79% last year. Caution should be exercised when comparing equity between years as the farm sample changes.

The benefit of taking risks and borrowing money can be seen when farm incomes yield a higher return on equity than on their return on assets. When the percentage of return on equity increases compared to return on assets, it is the result of a higher return from the additional assets than the interest or lease rate. In 2017–18, only five of the 32 (or 15%) of participant farms received a return on equity greater than their return on assets.

This year, all farms in the NSW Dairy Farm Monitor project sourced some of their metabolisable energy (ME) from imported feeds and are therefore somewhat exposed to fluctuations in prices and supply in the market for feed. The exposure to risk in 2017–18 was considerable, and significant increases in both concentrate and fodder prices negatively influenced feed costs in both regions. Exposure to risk was inevitable due to the poor growing conditions and reduced home grown feed availability across the state. North farms sourced a larger proportion of their diet from imported feed compared to 2016–17, up from 38% to 43%. South farms also increased imported feed from 43% to 45% of the total diet.

Table 3 Risk indicators – statewide and by region

	Statewide	North	South
Cost structure (percentage of total costs as variable costs)	59	58	61
Debt service ratio (percentage of income as finance costs)	6	5	8
Debt per cow	$3,903	$3,238	$4,757
Equity percentage (ownership of total assets managed)	77	81	72
Percentage of feed imported (as a percentage of total ME)	44	43	45

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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 47% of the diet for cows and concentrates 36%, which was similar to the previous year.

In the South farms grazed pasture made up 37% of the diet, down from 47% in the previous year, with a similar percentage of 35% of the diet coming from concentrates. South farms source 27% of the diet from hay and silage, up from 19% in the previous year. North farms sourced 16% of ME from hay and silage.

These figures indicate that pasture production was down on many 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. This is then divided into grazed and conserved feed, depending on the quantity of fodder production recorded.

Total home grown feed consumed on the milking area (by direct grazing plus conservation) in 2017–18 was lower than the previous year by 0.5 t DM/ha across both regions.

The North directly grazed 7.1 t DM/ha, and conserved 1.1 t DM/ha, for a total of 8.2 t DM/ha. The South consumed an average of 5.6 t DM/ha of direct grazed pasture and conserved 1.1 t DM/ha, for a total of 6.7 t DM/ha.

Appendix Table 2 gives estimates of quantity of home grown feed consumed per milking hectare of sample farms across the state.

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 home grown feed consumed per milking area hectare
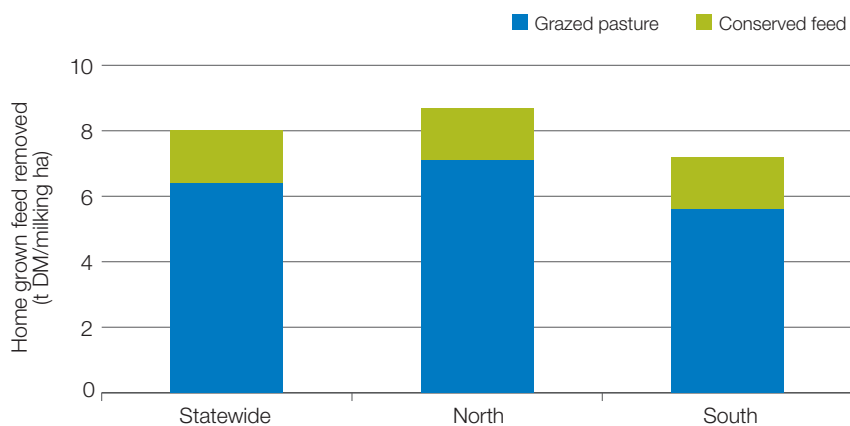
Fertiliser application

Application of nutrients in 2017–18 increased on a per hectare basis from the previous year for nitrogen and phosphorus, but decreased for potassium and sulphur. Average fertiliser usage on the usable area for the State was: nitrogen at 134 kg/ha, phosphorus 17 kg/ha, potassium at 20 kg/ha, and sulphur at 11 kg/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 plus other factors will all influence pasture growth and fertiliser application strategies. These particular strategies 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 2017–18 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

In order to achieve the flat milk production cows need to be calving all year round, and this is evident in the graph of monthly calving pattern in Figure 11. 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 usable hectare
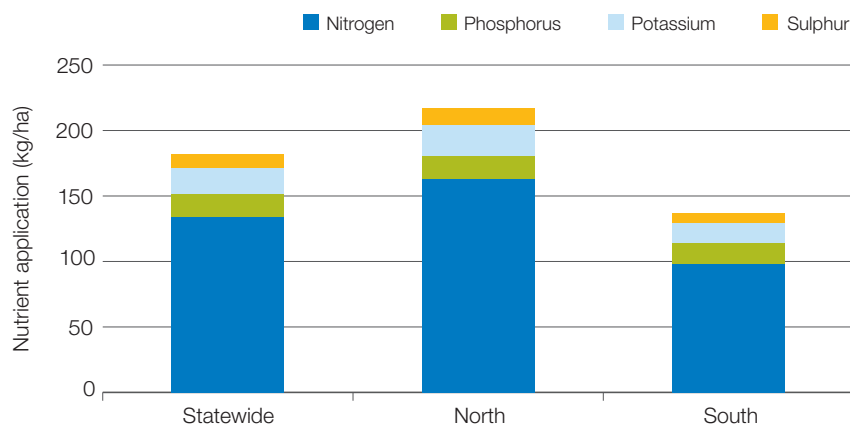
Figure 10 Monthly distribution of milk solids sold
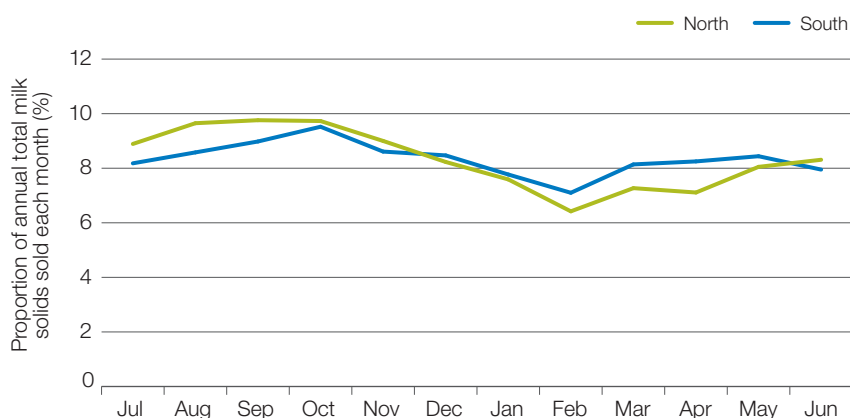
Figure 11 Monthly distribution of calves born
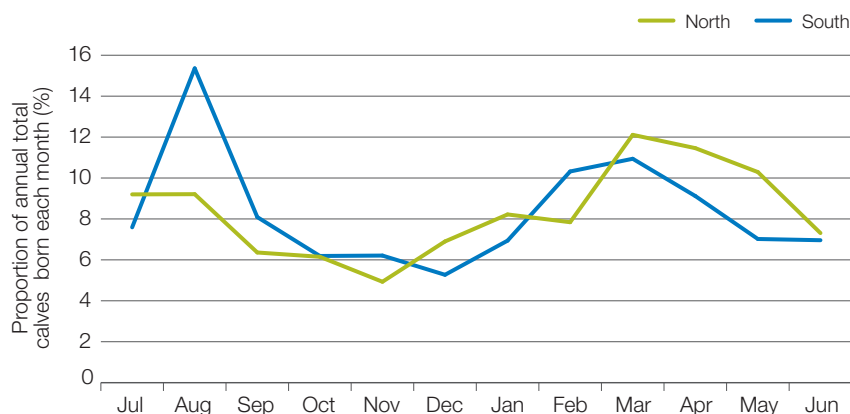
There were three new farms in the North dataset this year, and three farms from last year did not participate.

Seasonal conditions

This was a much drier year than the previous one, 2017–18 seasonal conditions were poor in northern NSW, with some regions receiving the lowest monthly rainfall on record. The spring of 2017 was particularly dry, limiting pasture growth and fodder conservation. A dry autumn forced many farmers to exhaust existing fodder reserves and rely on purchased feed from a tight market.

All North farms received well below average long term rainfall (Figure 12). Average rainfall for the Northern dataset dropped to 864 mm in 2017–18, down from 1216 mm in the previous year.

Whole farm analysis

Participant dairy farmers in the North received an average milk price of $7.62/kg MS sold this year, up from $7.28/kg MS in the previous year.

Good prices were received for dairy stock generally as well as cull cattle, however as the drought continued farmers chose to cull an increased number of cows to try to reduce feed costs. Livestock prices and demand for cattle decreased as the year went on. Both a reduction in herd size and lower cull cattle prices contributed to a reduction in livestock trading profit.

Grain and fodder prices steadily increased during 2018 and feed was transported from interstate as the demand from dairy and other livestock industries exceeded supply from local NSW sources.

The farms in this year's dataset for the North had lower milk production per cow but higher milk production per hectare than the previous year.

Labour efficiency remained the same as the previous year, and ranged from 21,822 to 39,709 kg MS/full time equivalent (kg MS/FTE) across the farms in the group. This indicates that some used labour more efficiently than others, but the North average was still well down on that of the top 25% farmers.

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 3 of this report, the top 25% shown are across all farms in the state, due to the small sample size.

Milk solids sold

Average milk solids sold per hectare increased this year to 698 kg MS/ha (9,300 litres/ha). Average milk solids sold per cow however were lower than last year, at 459 kg MS/cow (6,380 l/cow), with a range of 376 kg MS/cow to 542 kg MS/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 $8.39/kg MS (62 c/l) included milk income of $7.62/kg MS (56 c/l) plus all other income associated with the dairy business operation of $0.77/kg MS (6 c/l).

This year's average gross farm income was 2% higher than last year's average. The milk price received was up 5.5%, but this was partially offset by lower other farm income, which decreased by 20% from last year.

Figure 14 shows the gross farm income for each farm.

Figure 12 Annual rainfall and long term average rainfall
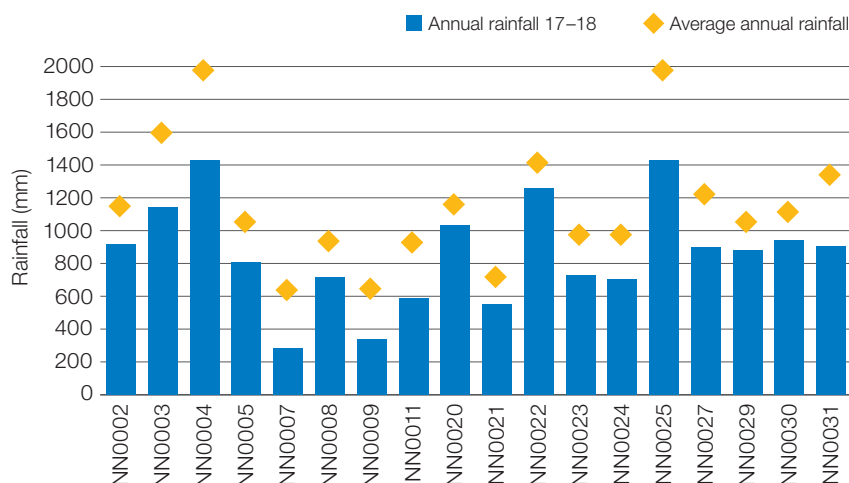
Figure 13 Milk solids sold per usable hectare
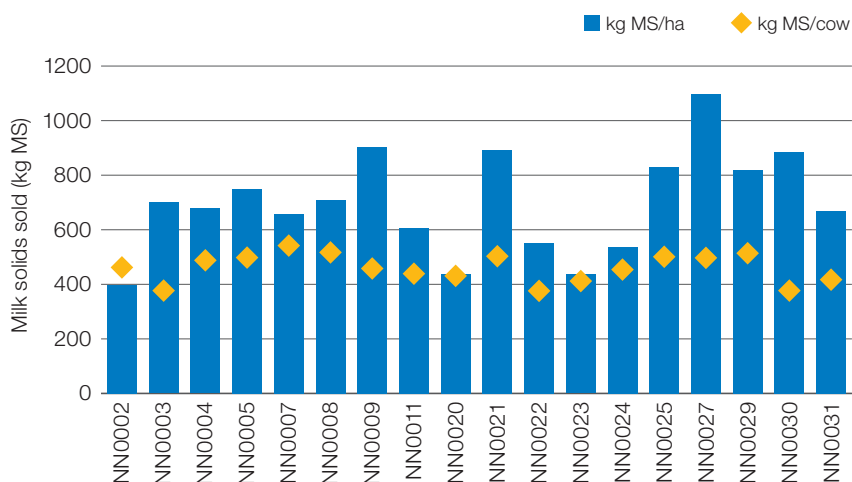
Figure 14 Gross farm income per kilogram of milk solids
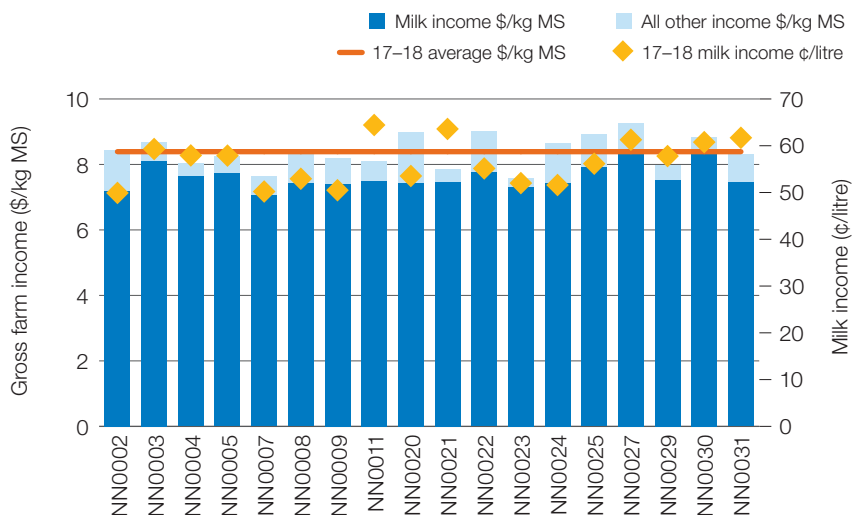
Table 4 Farm physical data

Farm physical parameters	North average	Q1 to Q3 range	State top 25% average
Annual rainfall 17–18 (mm)	864	708–1,008	605
Total water use efficiency (t DM/100mm/ha)	0.6	0.5–0.7	0.7
Total usable area (hectares)	188	120–238	310
Milking cows per usable hectares	1.5	1.3–1.7	1.4
Milk sold (kg MS/cow)	459	421–500	522
Milk sold (kg MS/ha)	698	564–826	703
Home grown feed as percentage of ME consumed	57	47–66	59
Labour efficiency (milking cows/FTE)	70	64–74	79
Labour efficiency (kg MS/FTE)	32,110	28,354–35,604	41,686

Variable costs

Variable costs (shown as the red 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).

The average variable cost was $4.79/kg MS (35.4 c/l) with a range of $3.35/kg MS to $6.34/kg MS for participant farms in the North. This is 16% higher than in 2016–17 due to a sharp increase in purchased feed costs. Herd and shed costs were similar to last year at $0.38/kg MS and $0.33/kg MS, respectively.

Feed costs were the most significant variable cost items, accounting for 85% of the average variable cost in 2017–18. The average feed cost was $4.09/kg MS, which is 20% higher than last year's cost of $3.41/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 lower than the previous year at $1.35kg MS, mainly due to a decrease in the amount of fodder conserved, and therefore lower cost of hay and silage making and irrigation cost per kg MS.

Purchased feed and agistment costs were $2.76/kg MS, which is 45% higher than the previous year, on the back of escalating prices for grain and hay.

The average cost of concentrates this year was $442/t DM, ($400/t as fed), up from $376/t DM last year. North farmers fed an average of 2.2 t DM/head concentrates to the milkers, although this figure does include concentrates fed to young stock on the milking area. The total cost of concentrate fed increased due to higher prices rather than an increase in the amount of concentrate fed.

The average cost of purchased hay this year was $372/t DM, ($320/t as fed).

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 overhead costs this year ranged from $2.26/kg MS to $4.78/kg MS (shown as blue bars in Figure 15).

The average overhead costs for 2017–18 at $3.46/kg MS (25.6 c/l) were only 2% higher than the previous year.

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 total overhead costs. This year labour costs were the same as the previous year.

The percentage breakdown of the individual totals expressed as percentages are presented in Appendix Table B6

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.

The increase in cost of production was largely due to higher purchased feed and agistment costs.

Note that the top 25% farms are across the whole state, not for each region, based on return on total assets.

Figure 15 Whole farm variable and overhead costs per kilogram of milk solids
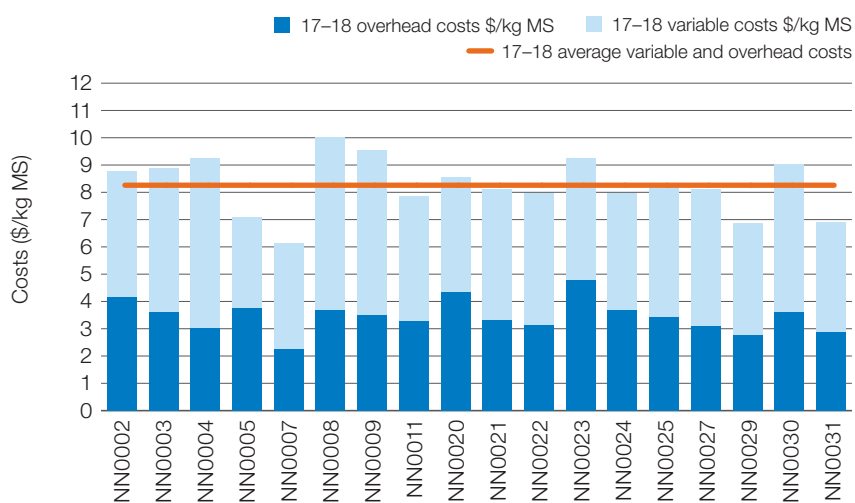
Table 5 Average farm financial performance – northern NSW

Farm income and cost category	North average		Q1 to Q3 range	State top 25% average	
Income	**$/kg MS**	**c/l**	**$/kg MS**	**$/kg MS**	**c/l**
Milk income (net)	7.62	56.5	7.42–7.74	7.25	53.7
Livestock trading profit	0.62	4.5	0.41–0.80	0.62	4.6
Other farm income	0.15	1.1	0.01–0.24	0.03	0.2
Total income	**8.39**	**62.1**	**8.06–8.8**	**8.00**	**58.6**
Variable costs					
Herd cost	0.38	2.8	0.32–0.43	0.32	2.4
Shed cost	0.33	2.4	0.26–0.39	0.23	1.7
Home grown feed cost	1.35	10.0	1.17–1.54	1.24	9.2
Purchased feed and agistment	2.76	19.5	2.24–3.05	2.23	16.4
Feed inventory change	-0.03	-0.2	-0.15–0.13	-0.12	-0.9
Water inventory change	0.00	0.0	0–0	-0.01	-0.1
Total feed costs	4.09	30.2	3.57–4.56	3.34	24.7
Total variable costs	**4.79**	**35.4**	**4.20–5.22**	**3.88**	**28.8**
Gross margin	**3.60**	**26.7**	**3.19–4.22**	**4.02**	**29.8**
Overhead costs					
Employed labour	0.94	6.9	0.60–1.19	0.76	5.6
Repairs and maintenance	0.48	3.5	0.37–0.61	0.34	2.6
All other overheads	0.44	3.2	0.32–0.57	0.26	1.9
Imputed labour	1.22	9.1	0.92–1.44	0.93	7.0
Depreciation	0.39	2.9	0.28–0.49	0.30	2.2
Total overhead costs	**3.46**	**25.6**	**3.12–3.70**	**2.59**	**19.3**
Variable and overhead costs	**8.26**	**61.0**	**7.89–9.00**	**6.48**	**48.1**
Earnings before interest and tax	**0.13**	**1.1**	**-0.31–1.07**	**1.43**	**10.5**

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	6.67	49.2	6.06–7.33	5.38	39.8
Cost of production excluding inventory change	8.28	61.2	7.67–8.95	6.61	49.1
+/- feed inventory changes	-0.02	-0.2	-0.15–0.14	-0.13	-1.0
+/- livestock inventory changes minus purchases	0.12	0.9	-0.09–0.23	-0.14	-1.1
Cost of production including inventory change	8.38	61.9	7.51–8.90	6.34	47.0

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 declined to $0.13/kg MS (1.1 c/l) compared to $0.75/kg MS (10 c/l) last year. This was mainly due to the higher costs, which offset the small increase in gross income.

Figure 16 shows a wide range in EBIT across the North farms, from negative $1.71/kg MS to $1.53/kg MS sold. Ten of the North farms recorded a positive EBIT, with eight farms in the negative.

The top 25% farms in the state recorded an average EBIT of $1.43/kg MS (11 c/l), highlighting the strength of these well run businesses. The management ability of the farmers is a crucial contributing factor to strong performance, which is not presented in this financial data. The timing of management decisions and a focus on two or three critical factors that contribute most to profit were some of the characteristics of the top performing farms.

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 under management.

Figure 17 shows RoTA per farm excluding capital appreciation.

The average return on total assets for participant farms this year was 0.5%, down from 1.8% the previous year. The range across the group was -5.5% to 4.4%.

Return on equity (RoE) is the net farm income expressed as a percentage of owner equity. It is a measure of the owner's rate of return on investment. The average RoE was -1.0%, a decrease from 0.8% recorded last year. There was a wide range of return on equity reflecting the various capital structures of businesses in Northern NSW. Eleven farms recorded a negative RoE as shown in Figure 18.

For return on equity including capital appreciation refer to Appendix Table B1.

Figure 16 Whole farm earnings before interest and tax per kilogram of milk solids
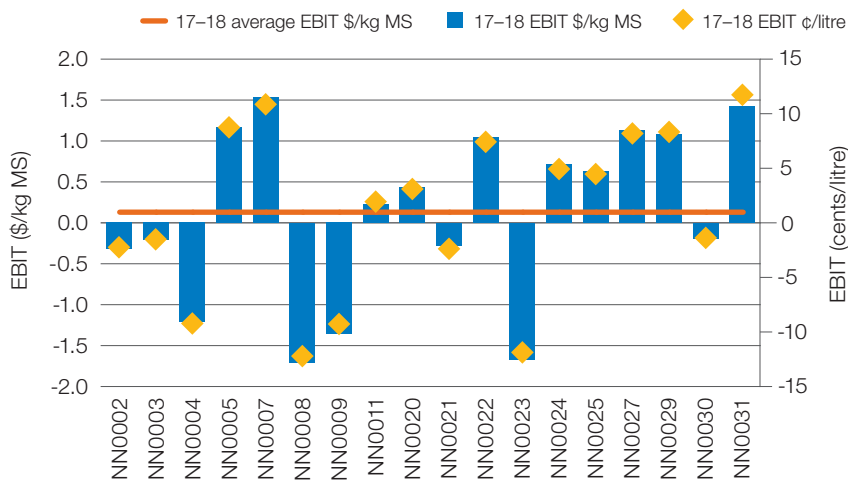
Figure 17 Return on assets
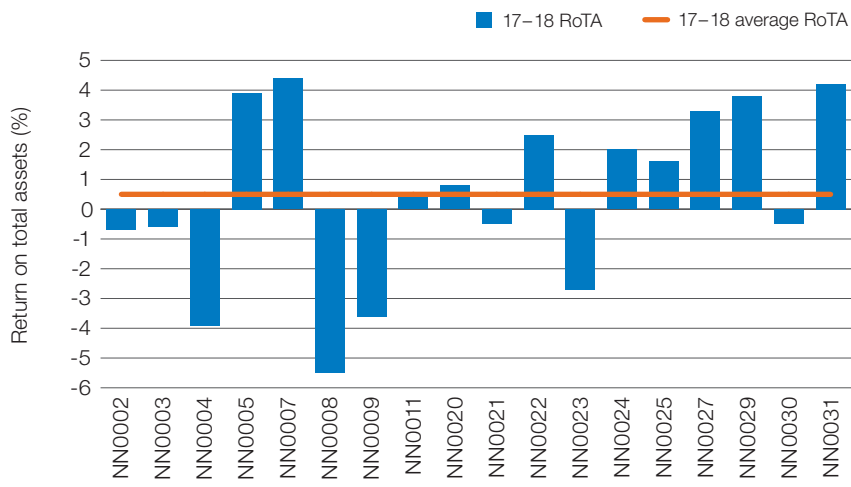
Figure 18 Return on equity
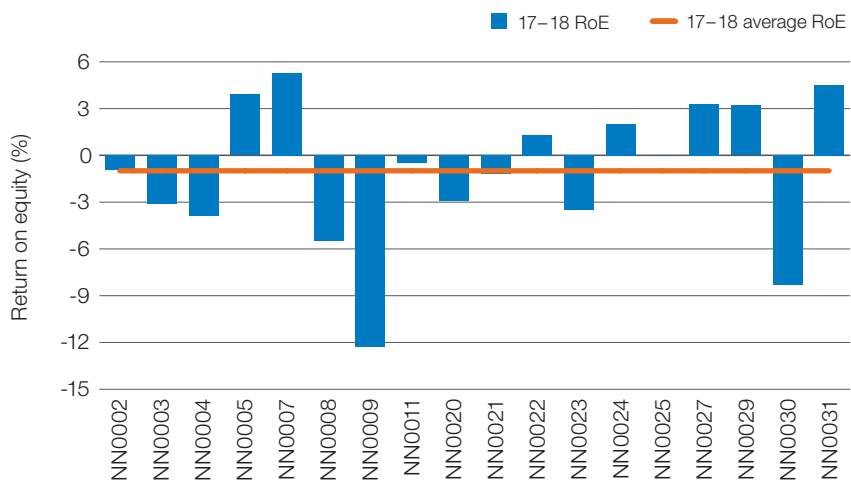
Feed consumption and fertiliser

Farms in the North exhibited 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 11 of the 18 farms this year, with the average being 47%, and the range was between 15% and 64%. The portion of the ME consumed derived from concentrates was higher this year at an average of 36%. All participant farms except one fed silage as part of their ME consumed with the range between 0% and 31%, with an average of 9% of the diet. Hay accounted for 7% of ME consumed on average, higher than the year before.

This combination of more concentrate, less silage and more hay 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 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 8.2 t DM/ha, which was lower than the previous year of 8.8 t DM/ha. This included an average of 7.1 t DM/ha directly grazed and 1.1 t DM/ha conserved. This year five 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.

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. Farms in the North applied a higher level of nitrogen, similar levels of phosphorus, but lower levels of potassium and sulphur per hectare in 2017–18 compared to the previous year (Figure 21).

Average nitrogen use was 163 kg/ha, phosphorus 17 kg/ha, potassium 24 kg/ha and sulphur 13 kg/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
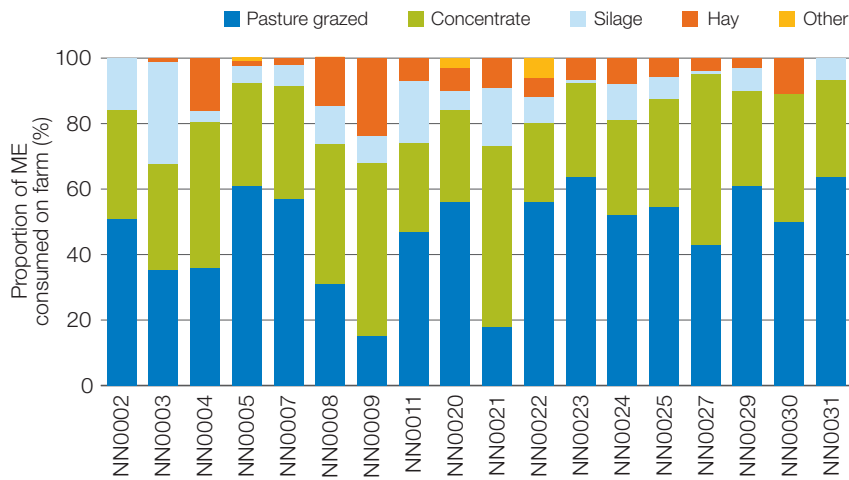
Figure 20 Estimated tonnes of home grown feed consumed per milking area hectare
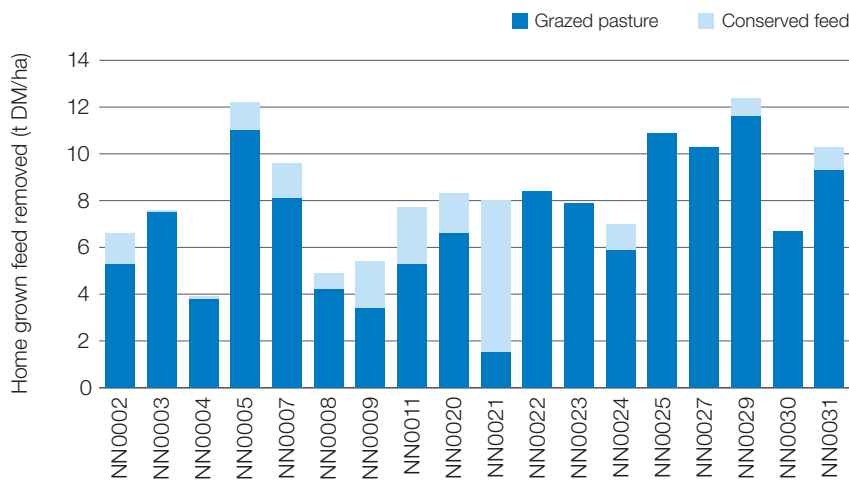
Figure 21 Nutrient application per usable hectare
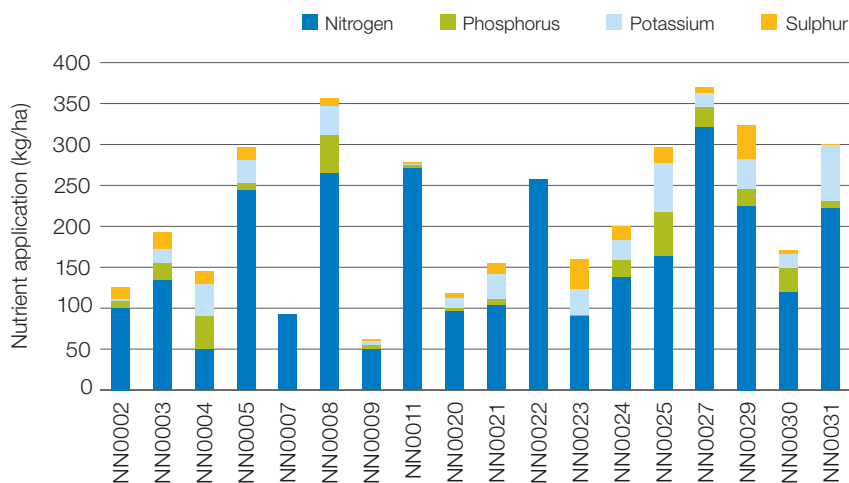
There were two new farms in the South dataset this year, and five farms from last year did not participate.

Seasonal conditions

Similar to the North region, 2017–18 was a much drier year than the previous one, with some regions receiving the lowest monthly rainfall on record. Poor seasonal conditions limited pasture growth and fodder conservation, forcing many farmers to exhaust fodder reserves and purchase hay in a tight supply market. Farms with irrigation were able to keep pasture growing, increasing water usage and pumping costs above usual levels.

Seasonal conditions were generally challenging with most farms receiving well below average rainfall. Average annual rainfall for the South farms was 530 mm compared to 810mm in the previous year.

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

Whole farm analysis

The farms in this year's group for the South had higher production per cow and per hectare than the previous year. As a consequence of dry conditions participant farms consumed less home grown feed per hectare, mainly due to lower amounts of pasture grazed and imported more feed.

Labour efficiency on average was higher than the previous year; and ranged from approximately 31,000 kg MS/full time equivalent (kg MS/FTE) to 67,000 kg MS/FTE. This indicates that some used labour more efficiently than others.

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.

NB: as explained on page 4 of this report, there are no reported regional top 25% farms this year due to the small sample size.

Milk solids sold

Average milk solids sold per hectare increased this year to 665 kg MS/ha (9,294 litres/ha), shown as the red bars in Figure 23. The range this year was between 390 kg MS/ha and 997 kg MS/ha (5,421 litres/ha to 13,858 litres/ha).

The average milk solids sold per cow were also higher than last year, at 526 kg MS/cow (7,311 litres/cow), with a range between 456 kg MS/cow and 691 kg MS/cow. These are represented by the blue diamonds in Figure 23.

Figure 22 2017–18 Annual rainfall and long term average rainfall
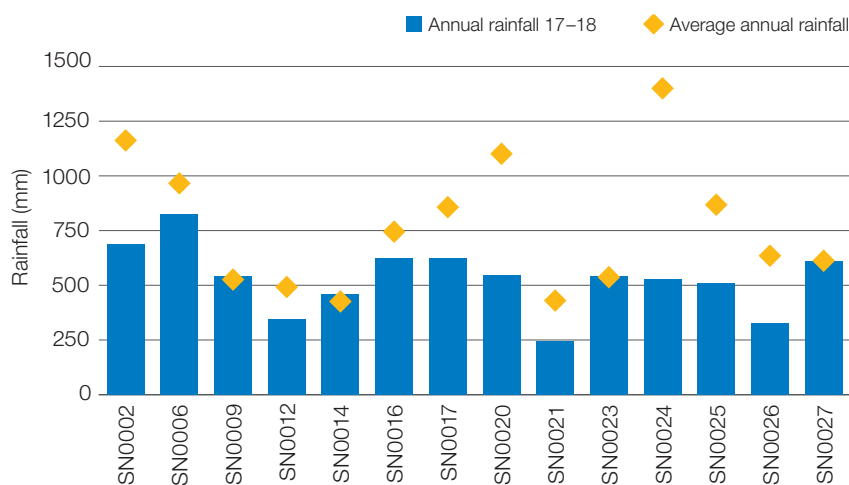
Table 7 Farm physical data

Farm physical parameters	South average	Q1 to Q3 range	State top 25% average
Annual rainfall 17–18 (mm)	530	471–622	605
Total water use efficiency (t DM/100mm/ha)	0.8	0.6–1.0	0.7
Total usable area (hectares)	333	188–355	310
Milking cows per usable hectares	1.3	1.1–1.5	1.4
Milk sold (kg MS/cow)	526	494–556	522
Milk sold (kg MS/ha)	665	499–814	703
Home grown feed as percentage of ME consumed	55	47–64	59
Labour efficiency (milking cows/FTE)	85	71–93	79
Labour efficiency (kg MS/FTE)	44,513	38,411–49,261	41,686

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 $7.49/kg MS (56 c/l), which included milk income of $6.81/kg MS (51 c/l) plus all other income associated with the dairy business operation of $0.68/kg MS (5 c/l).

This year's average gross farm income was 2% lower than last year's average. The milk price received was up 5%, but this was partially offset by lower livestock trading, which decreased by 36% from last year.

The average milk price of $6.81/kg MS sold this year was 5% up from $6.48/kg MS in the previous year.

Figure 24 shows the gross farm income for each farm.

Variable costs

Variable costs (shown as the 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 $4.20/kg MS (31 c/l) with a range of $3.21kg MS to $5.61/kg MS for participant farms in the South. This is 14% higher than in 2016–17 due to an increase in purchased feed costs. Herd and shed costs were similar to last year at $0.34/kg MS and $0.23/kg MS, respectively.

Feed costs are the largest variable cost, accounting for 83% of total variable costs. Average feed costs including feed inventory change was $3.63/kg MS (27 c/l), which is 19% higher than last year's cost of $3.06/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.

Figure 23 Milk solids sold per hectare and per cow
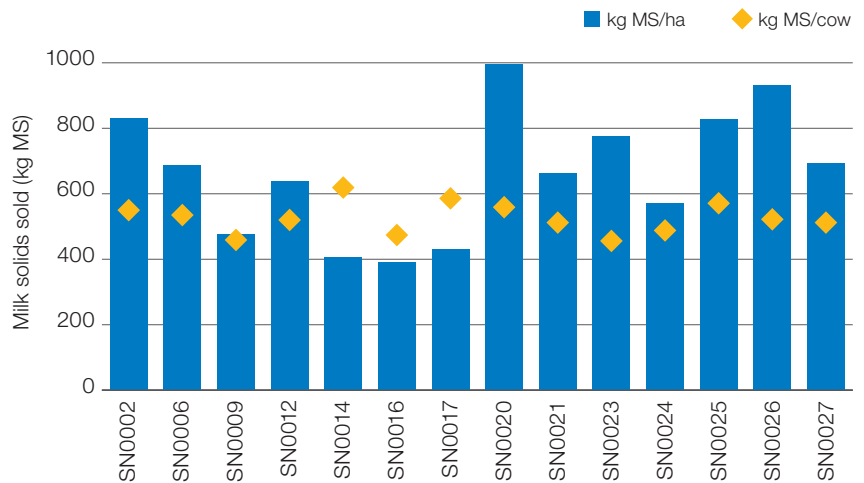
Figure 24 Gross farm income per kilogram of milk solids
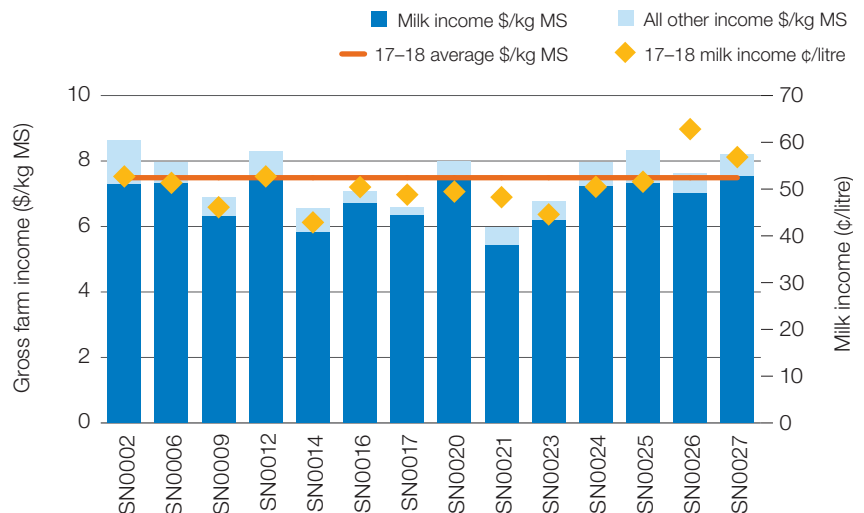
Figure 25 Whole farm variable and overhead costs per kilogram of milk solids
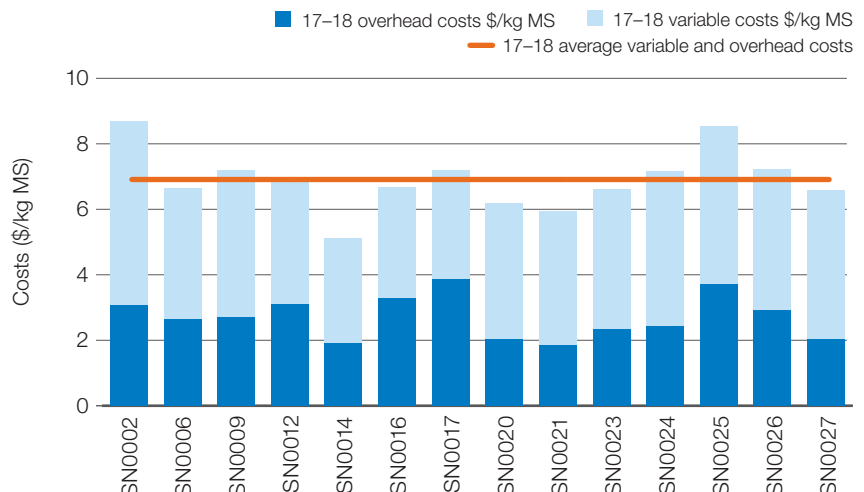
The average cost of home-grown feed was $1.09/kg MS, which was the same as the previous year. Purchased feed and agistment cost was $2.53/kg MS, up from $2.04/kg MS in the previous year, on the back of escalating prices for grain and hay.

The average cost of concentrates this year was $398/t DM, ($360/t as fed), up from $336/t DM last year. South farmers fed 2.3 t DM/head concentrates to the milkers, although this figure includes concentrates fed to young stock on the milking area. The cost of concentrate fed increased due to higher prices and a small increase in the amount of feed fed.

The average cost of purchased hay this year was $276/t DM ($235/t as fed).

A breakdown of variable costs for the individual businesses is shown in Appendix Table C6

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 overhead costs this year ranged from $1.86/kg MS to $3.86/kg MS (shown as red bars in Figure 25).

The average overhead costs for 2017–18 were $2.71/kg MS (20 c/l), which was 4% lower than the previous year.

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 $1.60/kg MS account for 59% of total overheads, similar to the North.

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

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)	6.81	50.6	6.32–7.33	7.25	53.7
Livestock trading profit	0.63	4.7	0.45–0.74	0.62	4.6
Other farm income	0.05	0.4	0–0.06	0.03	0.2
Total income	**7.49**	**55.7**	**6.81–8.13**	**8.00**	**58.6**
Variable costs					
Herd cost	0.34	2.5	0.21–0.45	0.32	2.4
Shed cost	0.23	1.7	0.18–0.26	0.23	1.7
Home grown feed cost	1.09	8.3	0.64–1.33	1.24	9.2
Purchased feed and agistment	2.53	17.7	2.05–3.06	2.23	16.4
Feed inventory change	0.01	0.2	-0.15–0.14	-0.12	-0.9
Water inventory change	0.01	0.1	0–0	-0.01	-0.1
Total feed costs	3.63	27.1	3.24–3.93	3.34	24.7
Total variable costs	**4.20**	**31.3**	**3.9–4.51**	**3.88**	**28.8**
Gross margin	**3.29**	**24.4**	**3.08–3.69**	**4.02**	**29.8**
Overhead costs					
Employed labour	0.76	5.8	0.40–1.12	0.76	5.6
Repairs and maintenance	0.36	2.7	0.23–0.32	0.34	2.6
All other overheads	0.37	2.7	0.35–0.42	0.26	1.9
Imputed labour	0.84	6.2	0.58–1.08	0.93	7.0
Depreciation	0.38	2.8	0.22–0.45	0.30	2.2
Total overhead costs	**2.71**	**20.2**	**2.12–3.09**	**2.59**	**19.3**
Variable and overhead costs	**6.91**	**51.5**	**6.58–7.21**	**6.48**	**48.1**
Earnings before interest and tax	**0.58**	**4.2**	**-0.02–1.34**	**1.43**	**10.5**

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 $6.84/kg MS (51 c/l) from $6.46/kg MS in 2016–17. The increase in cost of production was due to higher variable costs, mainly purchased feed costs.

There was a range in cost of production across the farms from $4.83 to $9.02/kg MS.

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 47% to $0.58/kg MS (4.2 c/l), compared to $1.10/kg MS (11 c/l) last year.

Figure 26 shows a wide range in EBIT across the South farms, from negative $0.62/kg MS to $1.80/kg MS sold. Ten of the South farms recorded a positive EBIT, with four farms recording a negative result.

The top 25% farms in the state recorded an average EBIT of $1.43/kg MS (10.5 c/l), highlighting the strength of these well run businesses. The management ability of the farmers is a crucial contributing factor to strong performance, which is not presented in this financial data. The timing of management decisions and a focus on two or three critical factors that contribute most to profit were some of the characteristics of the top performing farms.

Return on total assets and equity

Return on total assets (RoTA) is the EBIT expressed as a percentage of total assets under management. It is an indicator of the overall earning power of total assets, irrespective of capital structure. 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 2.1%, down from 2.7% in the previous year. Four farms had a negative or zero return on assets. The range was negative 1.3% to 7.1%.

Land value is a major component of the assets under management, and it is worth noting that there is a huge 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 0.6% compared with 2.1% last year. There was a wide range of return on equity reflecting the various capital structures of businesses in Southern NSW. Six farms recorded a negative RoE.

Debt per cow increased for South farms this year, and equity percentage dropped from 76% to 72%. The combination of lower profit and higher debt levels have contributed to the lower RoE.

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

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	5.68	42.2	5.19–6.04	5.38	39.8
Cost of production excluding inventory change	6.89	51.3	6.39–7.27	6.61	49.1
+/- feed inventory changes	0.02	0.2	-0.15–0.13	-0.13	-1.0
+/- livestock inventory changes minus purchases	-0.07	-0.5	-0.26–0.13	-0.14	-1.1
Cost of production including inventory change	6.84	50.9	6.43–7.25	6.34	47.0

Figure 26 Whole farm earnings before interest and tax per kilogram of milk solids
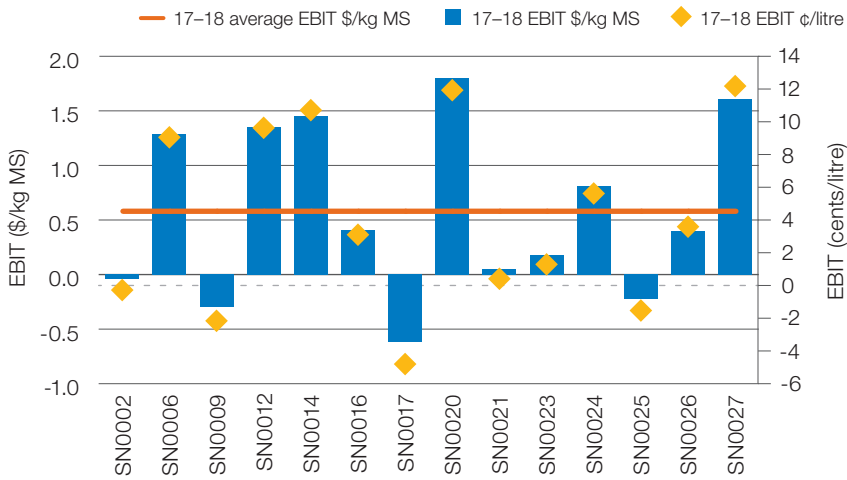
Figure 27 Return on assets
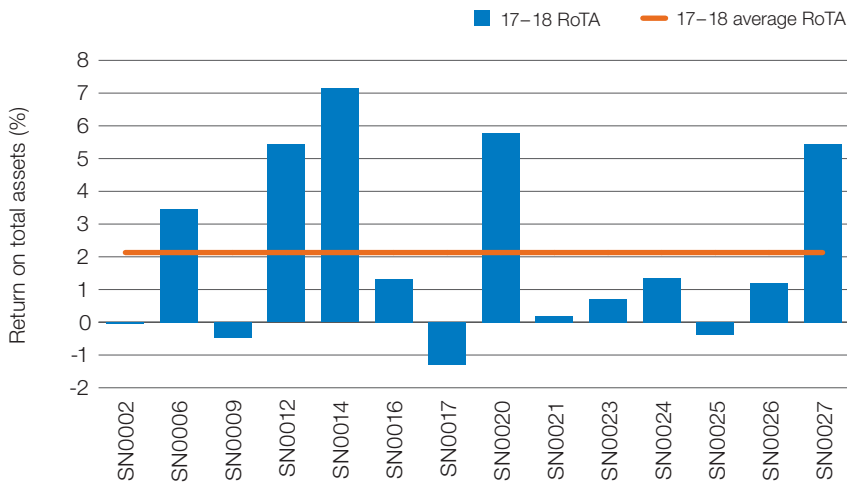
Figure 28 Return on equity
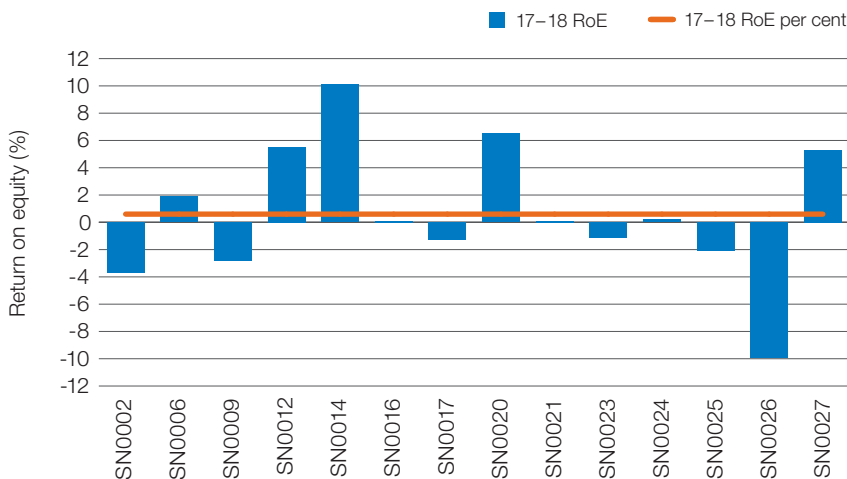
Feed consumption and fertiliser use

Southern participant farms exhibited a wide range of feeding systems.
In 2017–18 directly grazed pasture was not the main source of
metabolisable energy on the majority of the farms in this region,
due to the very dry conditions.

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 1 of the 14 farms this year, with the average being 37%, down from 44% last year. The range was between 14% and 51%. The portion of the ME consumed derived from concentrates was similar this year at an average of 35%. All participant farms fed hay and silage at higher levels than the previous year. Hay and silage accounted for 27% of ME consumed on average, compared with 20% for the year before.

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 7.2 t DM/ha, which was lower than the previous year of 8.2t. This year the amount directly grazed pasture was down, but the amount conserved per hectare was similar to the previous year. This included an average of 5.6 t DM/ha directly grazed and 1.6 t DM/ha conserved.

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.

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.

Figure 29 Sources of whole farm metabolisable energy
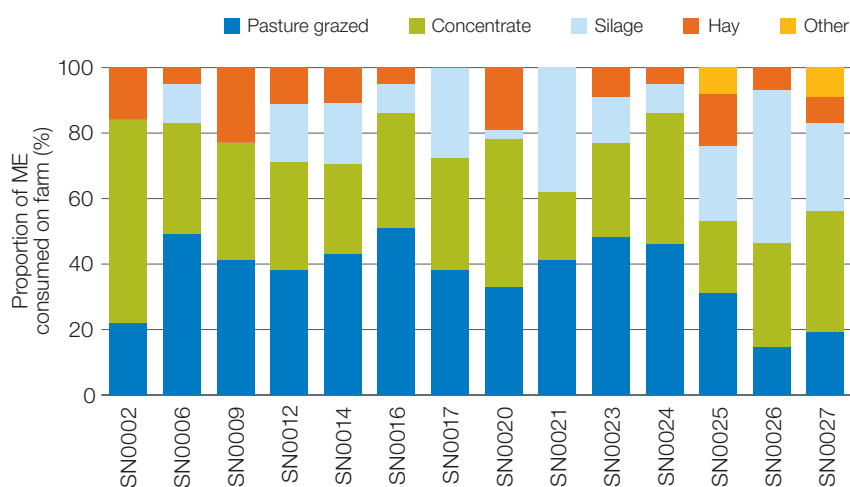
Fertiliser application

The proportion of nutrients in fertiliser applied per hectare on South farms in 2017–18 are shown in Figure 31.

All farms applied some fertiliser to their crops and pasture. This year South farms applied a higher level of nitrogen, similar levels of phosphorus and potassium but lower levels of sulphur per hectare compared to the previous year.

Application rates in 2017–18 were: nitrogen 98 kg/ha, phosphorus 16 kg/ha, potassium 15 kg/ha and sulphur 8 kg/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 30 Estimated tonnes of home grown feed consumed per milking area hectare
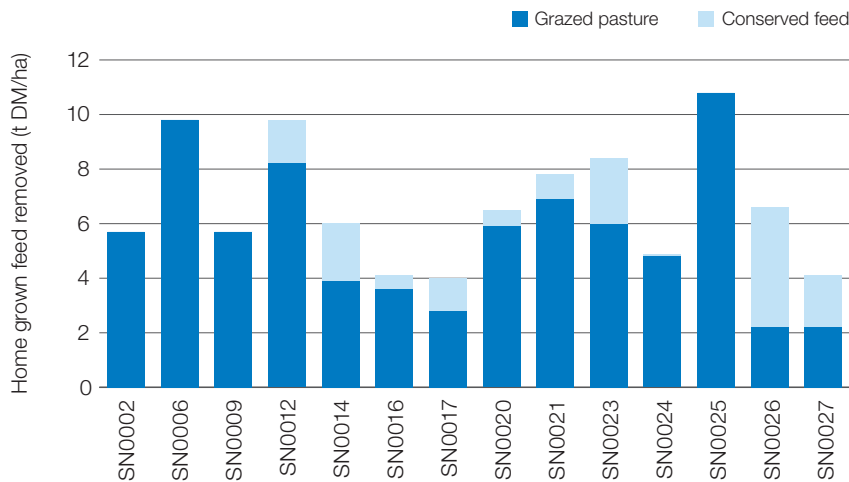
Figure 31 Nutrient application per useable hectare
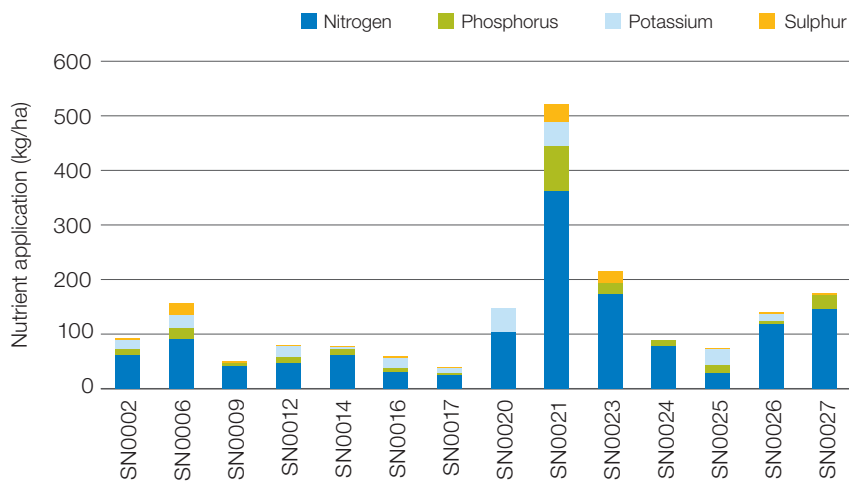
Expectations and issues

Responses to this business confidence survey were made in July and August 2018 with regard to the 2017–18 financial year and the next five years to 2022–23.

Expectations for business returns

Following lower average profits in the 2017–18 year, and the dry and challenging seasonal conditions, farmers' expectations about business profit for the 2018–19 season were mostly negative. Only 38% of farmers in the North, and 35% in the South expected an improvement in business profit.

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 62% of the participants in the North had an expectation of a deterioration or no change in farm business returns in 2018–19. In the South, 47% of participants expected a deterioration and 20% no change to business returns.

Price and production expectations – milk

Expectations about milk price in 2018–19 were similar between the regions. 53% were expecting an increase in farm gate milk price and 40% expected no change.

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. Whereas with the South farms only 27% intended to increase production, whilst 60% expected to remain the same. The remaining 12% of each group expected their milk production to decrease in the next year.

Figure 32 Expected change to farm business profit in 2018–19
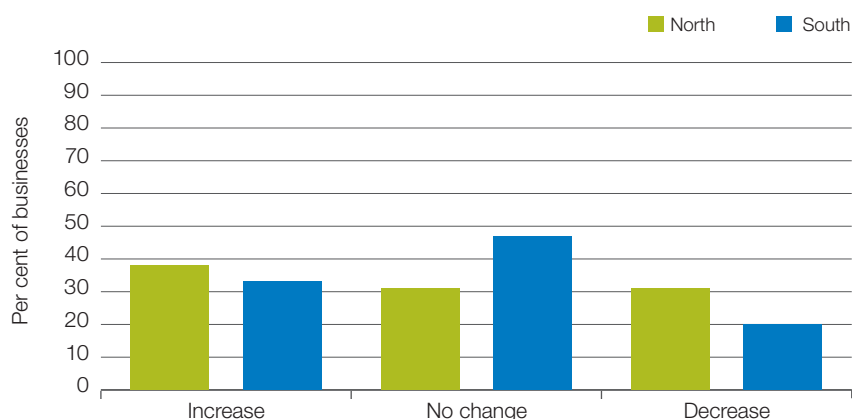
Figure 33 Producer expectations of prices and production of milk in 2018–19
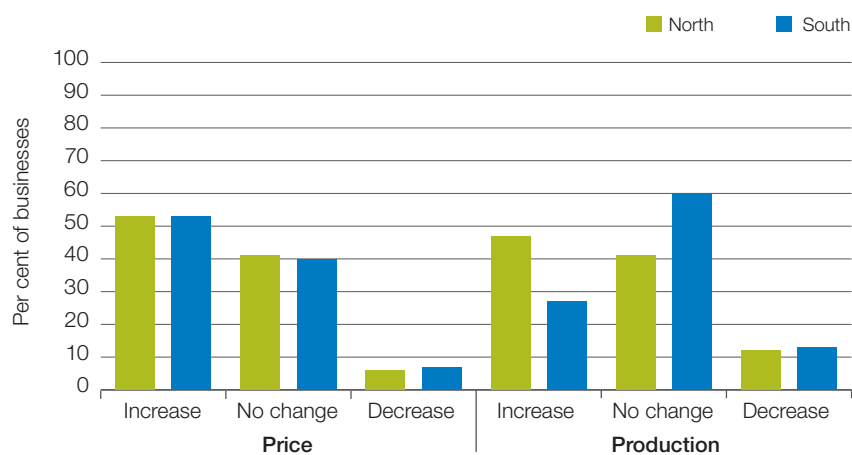
Figure 34 Producer expectations for production of fodder in 2018–19
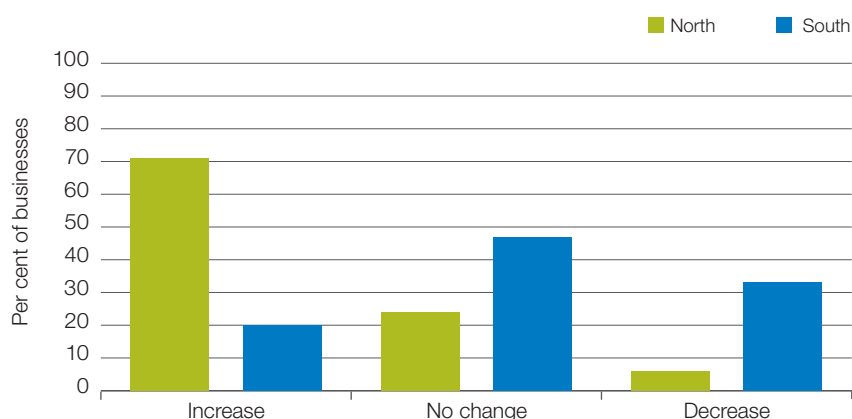
Production expectations – fodder

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

70% of participating farmers in the North expected fodder production to increase, with 24% expecting it to remain stable in 2018–19 (Figure 34). In the South the respondents were much less optimistic, with only 20% expecting an increase, 47% remaining stable and 33% 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.

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

Cost expectations

Data presented in Figure 35 shows the expectations of costs for the dairy industry from participant farms in the project.

The strongest response was for purchased feed costs, with 85% of respondents expecting an increase for the year ahead.

The majority of farmers expected input costs in all the other categories to remain stable in the year ahead. Among the irrigators, 35% predicted an increase in irrigation costs to their business, with 60% expecting no change.

Major issues in the dairy industry – the next 12 months

The participants were asked to consider seven issues identified in Figure 36, as either highly important, important, slightly important or not important, heading into the 2018–19 season.

Figure 36 shows that most of the respondents identified input costs and seasonal conditions as the most important issues they are facing in the short term (next 12 months). The results reinforce the expectation of increased purchased feed costs identified by 85% of farmers.

Pasture and fodder supply and milk price were the next most important issues.

Labour and succession planning were less important issues in the short term in this survey.

Farmers from both regions commented that the impact of the drought on water availability, pasture growth and the cost of purchased feed were their biggest concern for the next 12 months. The increase in feed costs were affecting farm business viability, as well as causing both mental and physical health issues. Several commented that adverse climatic conditions were becoming the norm with each passing year.

Figure 35 Producer expectations of costs for the dairy industry in 2018–19
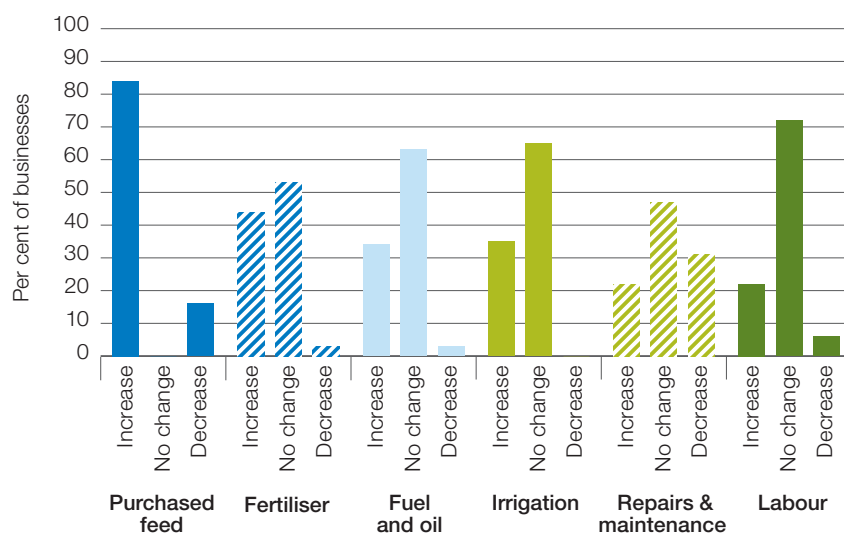
Major issues in the dairy industry – the next 5 years

The participants identified key issues for their business over the next five years (Figure 37).

The highly important issues for the next five years among the respondents were climate/seasonal conditions, input costs, pasture/fodder, and milk price.

Farmers were also concerned about the longer term viability of the dairy industry, with several commenting that milk price is too low and costs are too high. A number of participants said they are considering their options for the future, including alternative enterprises to dairying, retirement and succession planning. One quote captures the mood of a lot of the participants: "In the next five years managing a dairy business in an environment where the climate is changing, complicated by the range of management issues in a complex dairying system requires a product price that reflects these challenges."

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

Figure 36 Major issues for individual businesses – 12 month outlook
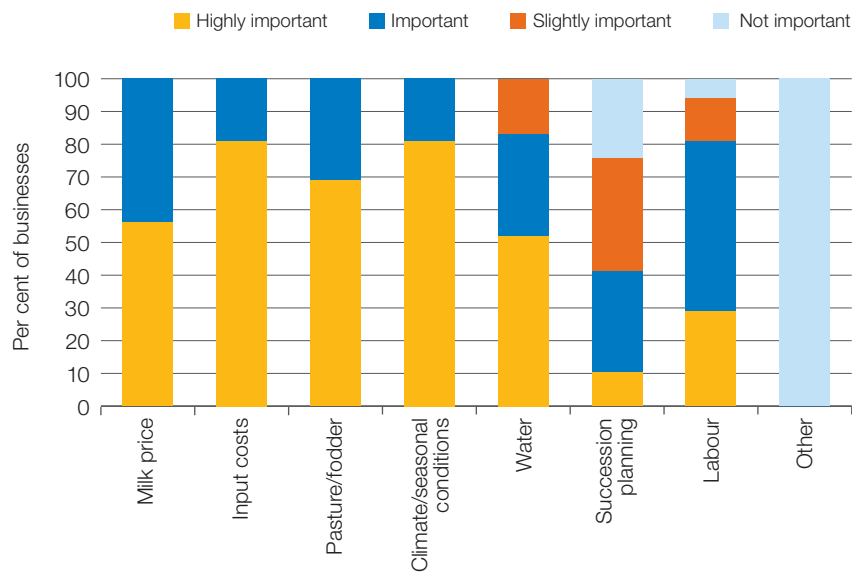
Figure 37 Major issues for individual businesses – 5 year outlook
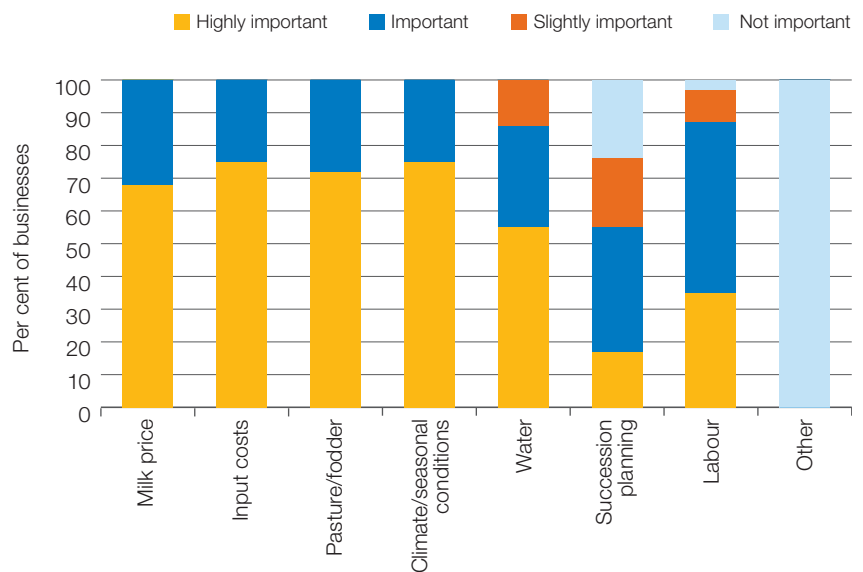
This year the greenhouse emissions calculation was generated through DairyBase using the Australian Dairy Carbon Calculator. The average emissions from participating farms was 15.5 tonnes of carbon dioxide equivalents per tonne of milk solids (t CO_2-e/t MS) in 2017–18. The most significant source of on-farm emissions were methane from ruminant digestion, contributing 63% of total farm emissions. The next biggest contributor was from pre-farm emissions sources; carbon dioxide from purchased feed and fertiliser, contributing 14 per cent.

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 2017–18 is shown in Figure 38. Greenhouse gas emissions per tonne of milk solids produced ranged from 12.4 t CO_2-e/t MS to 19.8 t CO_2-e/t MS with an average emission level of 15.5 t CO_2-e/t MS.

Methane was identified as the main greenhouse gas emitted from dairy farms, accounting for 9.8 t CO_2-e/t MS, 63% 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 9% of total emissions on average across the state in 2017–18.

The most efficient strategy to reduce enteric CH_4 production is manipulating the diet by increasing the feed quality through improved pastures or supplementation with particular concentrates and fat supplements. However, it is recommended that fats should not constitute more than 6–7% of the dietary dry matter intake.

The second main greenhouse gas emission was CO_2 being produced primarily from fossil fuel consumption as either electricity or petrochemicals. Carbon dioxide accounted for 24% of total emissions (2.8 t CO_2-e/t MS) in 2017–18.

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 14% of the emissions and 10% from on-farm energy sources. Output levels were highly dependent on the source of electricity used with all farms using black coal generated electricity. A small number of dairy farms installed solar panels to generate electricity and offset the rising cost of electricity.

Figure 38 2017–18 Greenhouse gas emissions per tonne of milk solids produced (CO_2 equivalent)
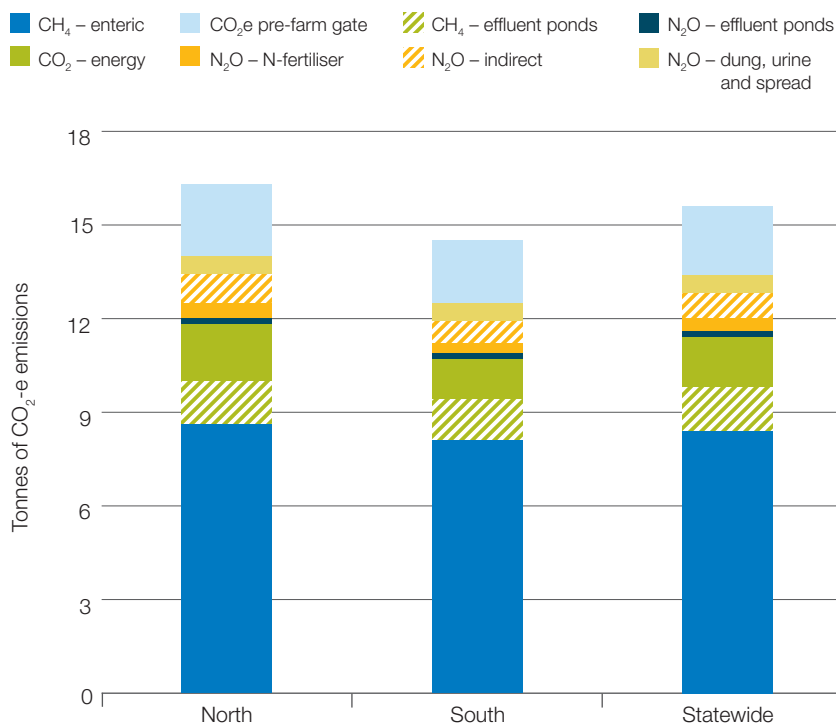
The third main greenhouse gas emission was nitrous oxide N_2O, accounting for 13% of total emissions or 2.0 t CO_2-e/t MS. This gas is produced from wastes (dung and urine); applied fertiliser and effluent ponds.

Nitrous oxide emissions from fertiliser accounted for 2.5% of total emissions, effluent ponds accounted for 1.5% and excreta accounted for 3.8%. 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 www.environment.gov.au/climate-change

North

Participant farms in the North emitted an average of 16.2 t CO_2-e/t MS in 2017–18, mainly from methane produced by ruminant digestion (62%) and nitrous oxide from effluent and fertiliser (11%).

Methane was the main greenhouse gas emitted from participant farms in the North, accounting for 10.0 t CO_2-e/t MS, 62% of the average total greenhouse emissions (Figure 49). Methane produced from ruminant digestion contributed 8.6 t CO_2-e/t MS to regional average emissions while methane from effluent ponds accounted for 1.4 t CO_2-e/t MS.

Carbon dioxide accounted for 4.1 t CO_2-e/t MS, 25% of emissions in 2017–18, which comprised 1.8 t CO_2-e/t MS from fossil fuels and 2.3 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 (CO_2 equivalent) north region
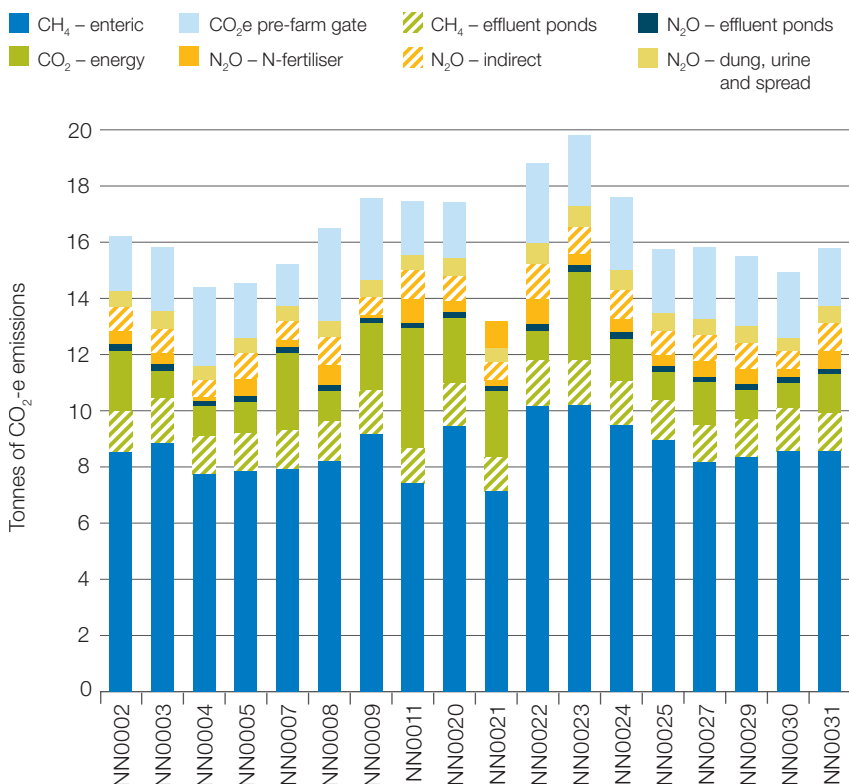
South

Participant farms in the South emitted an average of 14.5 t CO_2-e/t MS in 2017–18. The two main sources of the emissions were methane gas from ruminant digestion (65% of the total emissions) and carbon dioxide from purchased feed and fertiliser (14%).

Methane was the main greenhouse gas emitted from participant farms in the South West accounting for 9.4 t CO_2-e/t MS, 65% 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 2017–18, 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 1.8 t CO_2-e/t MS, 12% of all emissions. Direct emissions from applied nitrogen fertiliser, effluent management systems and animal wastes accounted for 1.1 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 (CO_2 equivalent) – south region

Legend:
- CH_4 – enteric
- CO_2 – energy
- CO_2e pre-farm gate
- N_2O – N-fertiliser
- CH_4 – effluent ponds
- N_2O – indirect
- N_2O – effluent ponds
- N_2O – dung, urine and spread
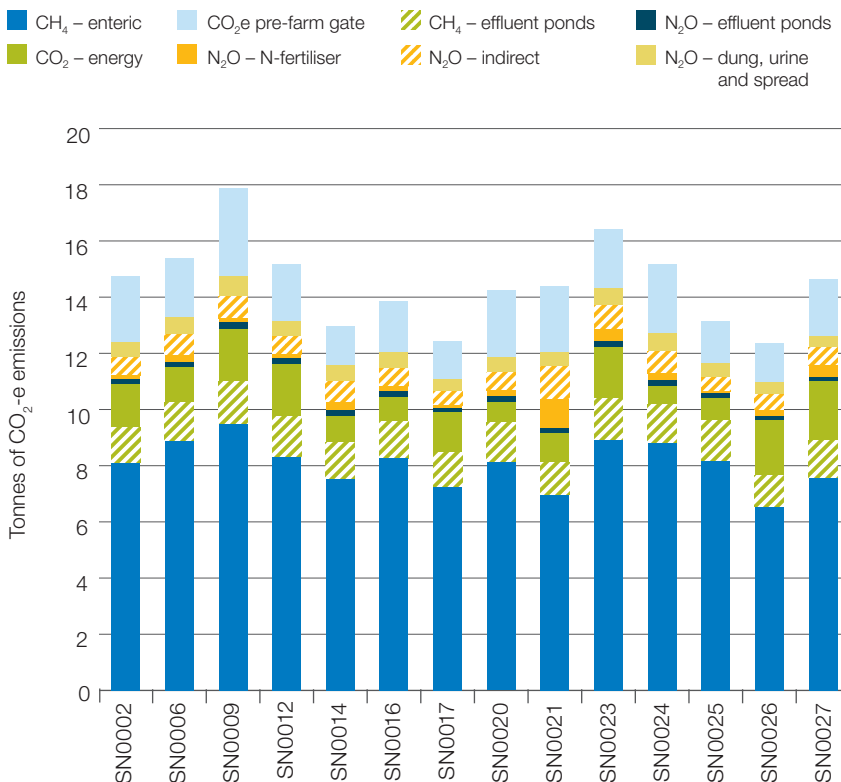
This section compares the performance of participant farms in the Dairy Farm Monitor Project over the past seven years. The historical analysis compares the trends in farm performance within and between the two regions. While figures are adjusted for inflation to allow comparison between years it should be noted that the same farms do not participate each year and care needs be taken when comparing the performance across years. The data for the historical analysis can be found in Appendix Tables 9 and 10 for the state and each region.

Farm profits in 2017–18 were the lowest in the seven year history of the project, both for EBIT and return on total assets. Feed costs were the highest in the history of the project, due to the drought and high prices for purchased feeds. Milk price was the third lowest recorded over the seven years. This trend is common to both the North and South regions; however whilst profitability has varied considerably, the farms in the South have had higher profitability than the North in all seven years since 2011–12.

The North

The graphs below show the trends in profits and returns over the past five years. The seven-year average for return on total assets (Figure 41) for the North is 1.5%, with a range of 0.5% to 3.0%. This year was the lowest RoTA at 0.5%.

The seven-year average return on equity was -0.2%, with a range of negative 1.7% to 2.2%. This year was the third lowest RoE for the project.

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 2017–18 the average EBIT per farm was $39,802, the lowest for the project, and down from $106,330 last year. The seven-year average (in real terms – including inflation) for EBIT for North farms was $97,226/farm.

Regarding net farm income, for three out of the seven 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 was negative $21,501/farm.

The 2017–18 year saw milk price improve by 5% in the North, but higher production costs led to a lower level of profit. Feed costs were the main contributor to the rise in costs, reaching over $4.00/kg MS for the first time in the life of the project. In contrast, overhead costs remained at a similar level to the previous years.

Figure 41 Historical whole farm performance – North
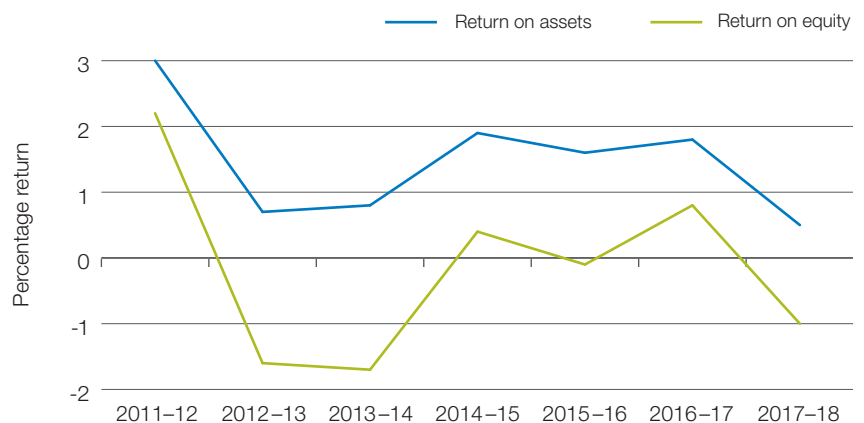
Figure 42 Historical farm profitability (real $) – North
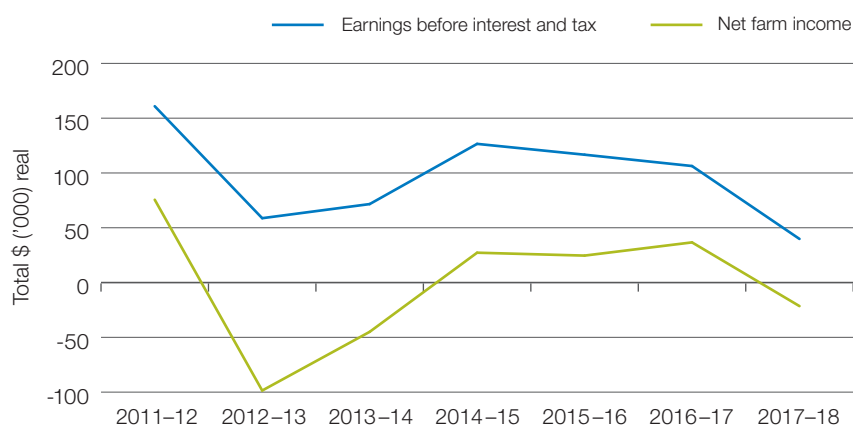
The South

The graphs below show the trends in profits and returns over the past seven years. The seven-year average for return on assets (Figure 43) for the South is 4.0%, with a range of 2.1 to 5.5%; and for return on equity the average was 2.8%, with a range of 0.6 to 5.7%.

Figure 44 shows the trend in earnings before interest and tax (EBIT) and in net farm income. 2017–18 was the lowest profit year over the course of the project, with an average EBIT per farm of $141,549. The seven-year average EBIT for South farms was $295,545.

As experienced in the North, 2017–18 saw milk price improve by 5%, but higher feed costs brought profits down. Feed costs reached over $3.60/kg MS, the highest in the life of the project. In contrast, overhead costs were lower than previous years.

Average return on total assets for the South farms in 2017–18 was 2.1%, which was the lowest in the seven-year history of the project. Return on equity was the second lowest at 0.6%.

Figure 43 Historical whole farm performance – South
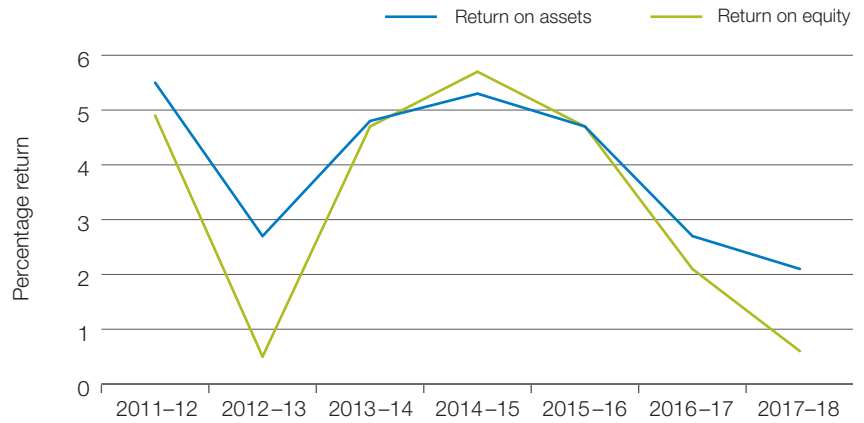
Figure 44 Historical farm profitability (real $) – South
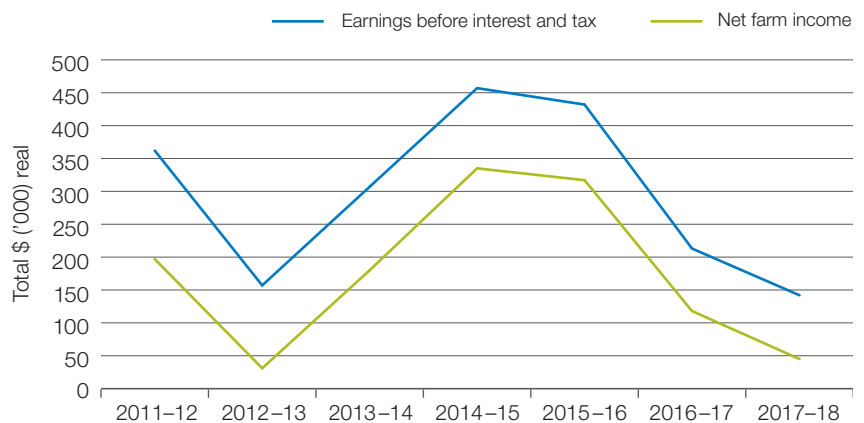
Figure 45 Regional historical earnings before interest and tax (real $)
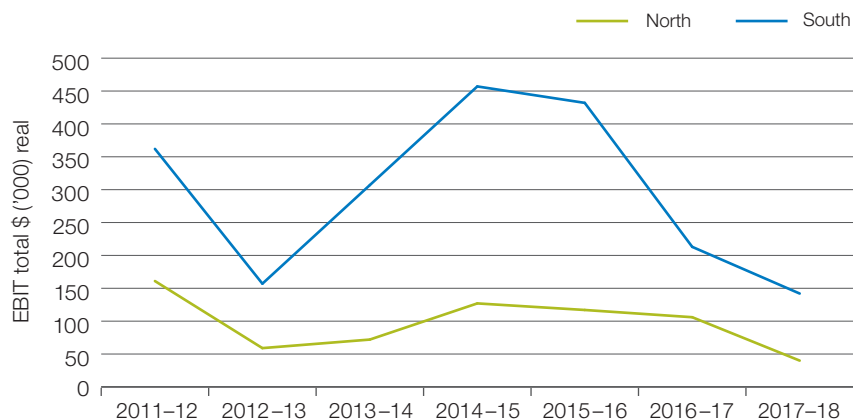
Regional comparison

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

In 2017–18 both regions experienced a downturn in profit compared to the previous year, and to the lowest levels over the history of 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 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.

Figure 46 Regional historical net farm income (real $)
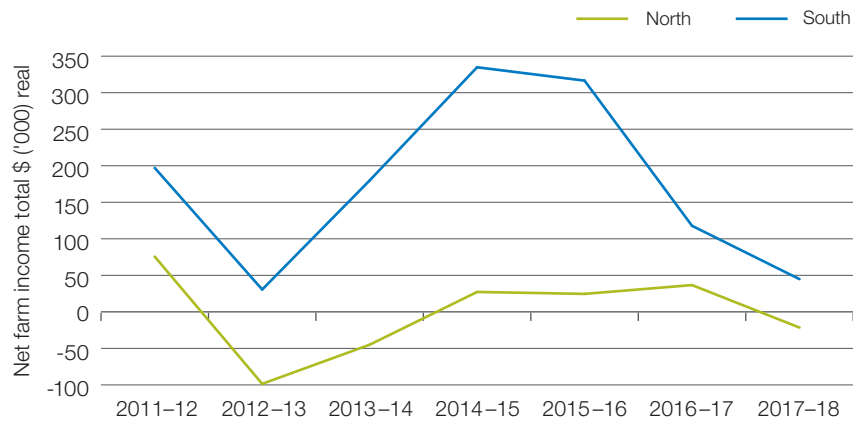
Figure 47 Regional historical return on total assets
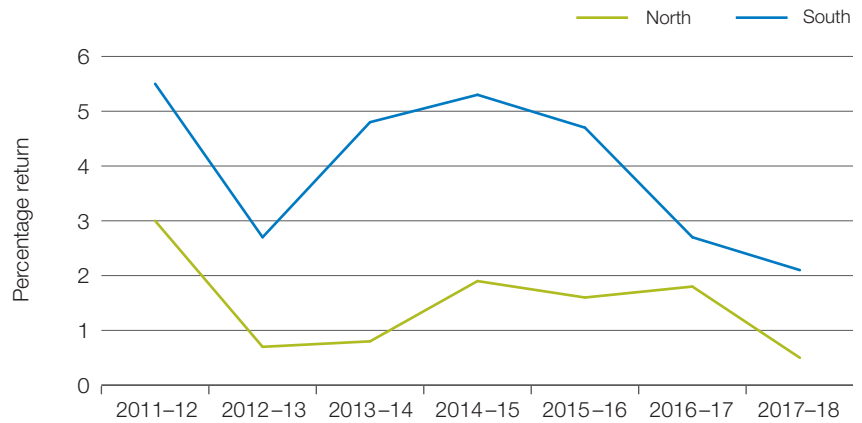
Figure 48 Regional historical return on equity
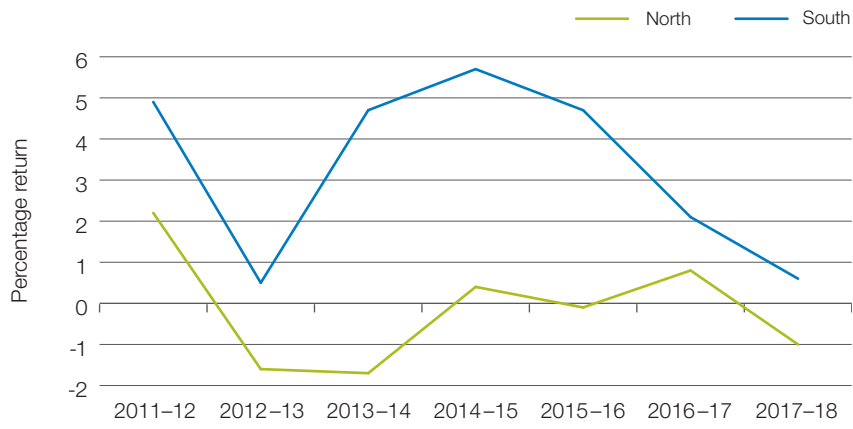
Appendices

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	7.27	0.73	8.00	4.53	3.13	59	0.33	1.2	0.51	6.3	-0.18	-0.3
Top 25 %	7.25	0.66	7.90	3.88	2.59	60	1.43	5.0	0.30	3.9	1.13	5.5

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	251	118	0.7	337	1.4	488	683	4.1	3.4
Top 25 %	310	142	0.8	400	1.4	522	703	4.1	3.3

	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	6.4	1.6	56	134.5	16.6	20.1	10.6	77	37,536
Top 25 %*	7.5	1.3	59	142.4	10.5	25.0	8.5	79	41,686

*on milking area

Table A3 Purchased feed

	Purchased feed per milker	Concentrate price	Silage price	Hay price	Other feed price	Average purchased feed price	Average ME of purchased feed	Average purchased feed price	Percent of total energy imported
	t DM/hd	$/t DM	$/t DM	$/t DM	$/t DM	$/t DM	MJ ME/kg	c/MJ	% of ME
Average	2.6	423	239	313	444	–	–	–	44
Top 25 %	2.5	435	133	277	538	–	–	–	41

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	0.13	0.16	0.07	0.15	0.13	0.65	0.40	0.21	0.18
Top 25 %	0.13	0.14	0.05	0.11	0.12	0.55	0.42	0.22	0.17

	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	0.16	0.29	0.11	0.50	1.99	0.06	-0.01	3.89	4.53
Top 25 %	0.12	0.29	0.02	0.32	1.85	0.06	-0.13	3.34	3.88

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	0.08	0.10	0.06	0.43	0.17	0.86	1.70	0.38	1.05	3.13
Top 25 %	0.05	0.06	0.05	0.34	0.11	0.76	1.36	0.30	0.93	2.59

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	1.8	2.1	0.9	2.0	1.7	8.5	5.3	3.0	2.4
Top 25 %	2.0	2.2	0.7	1.8	1.8	8.5	6.4	3.7	2.7

	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	2.0	3.8	1.4	6.3	26.0	0.8	-0.1	50.8	59.3
Top 25 %	1.9	4.4	0.3	4.9	28.6	0.9	-2.1	51.8	60.3

Table A7 Overhead costs – percentage

	Rates	Farm insurance	Motor vehicle expenses	Repairs and maintenance	Other overheads	Employed labour	Total cash overheads	Depreciation	Imputed owner/ operator and family labour	Total overheads
	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs
Average	1.0	1.3	0.8	5.5	2.1	11.2	22.0	5.0	13.7	40.7
Top 25 %	0.7	0.9	0.7	5.2	1.7	11.4	20.8	4.5	14.4	39.7

Table A8 Capital structure

Farm assets					Other farm assets (per usable hectare)				
	Land value	Land value	Permanent water value	Permanent water value	Plant and equipment	Livestock	Hay and grain	Other assets	Total assets
	$/ha	$/cow	$/ha	$/cow	$/ha	$/ha	$/ha	$/ha	$/ha
Average	17,587	12,067	1,425	1,091	1,782	3,227	267	460	23,833
Top 25 %	13,807	8,374	1,486	1,254	1,483	3,164	185	430	18,659

Liabilities			Equity	
	Liabilities per usable hectare	Liabilities per milking cow	Equity per usable hectare	Average equity
	$/ha	$/cow	$/ha	%
Average	5,722	3,903	18,110	77
Top 25 %	2,727	2,342	15,932	82

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)
2011–12	6.88	7.74	7.76	8.73	0.33	0.37	0.27	0.30	3.02	3.39	3.62	4.07
2012–13	6.43	7.06	7.20	7.91	0.33	0.36	0.28	0.31	3.18	3.49	3.79	4.16
2013–14	7.15	7.62	8.00	8.53	0.31	0.33	0.30	0.32	3.46	3.69	4.06	4.33
2014–15	7.46	7.84	8.44	8.87	0.32	0.34	0.29	0.31	3.55	3.73	4.16	4.37
2015–16	7.34	7.64	8.23	8.56	0.35	0.36	0.27	0.28	3.33	3.47	3.94	4.10
2016–17	6.89	7.04	7.94	8.11	0.38	0.38	0.26	0.27	3.27	3.34	3.91	3.99
2017–18	7.27	7.27	8.00	8.00	0.36	0.36	0.28	0.28	3.89	3.89	4.53	4.53
Average		7.46		8.39		0.36		0.30		3.57		4.22

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
2011–12	1.56	1.75	1.24	1.40	2.80	3.15	1.34	1.50	0.59	0.66	0.75	0.84	4.3	3.6
2012–13	1.71	1.88	1.19	1.31	2.90	3.19	0.51	0.57	0.62	0.68	-0.10	-0.11	1.7	-0.5
2013–14	1.80	1.92	1.25	1.34	3.05	3.25	0.88	0.94	0.62	0.67	0.26	0.28	2.6	1.2
2014–15	1.71	1.80	1.25	1.31	2.96	3.11	1.32	1.39	0.60	0.63	0.72	0.76	3.5	2.8
2015–16	1.75	1.82	1.41	1.47	3.16	3.29	1.12	1.17	0.54	0.56	0.58	0.61	3.0	2.1
2016–17	1.80	1.84	1.31	1.34	3.11	3.18	0.92	0.94	0.51	0.52	0.41	0.41	2.2	1.4
2017–18	1.70	1.70	1.44	1.44	3.13	3.13	0.33	0.33	0.51	0.51	-0.18	-0.18	1.2	-0.3
Average		1.81		1.37		3.20		1.08		0.60		0.37	2.6	1.5

Table A10 Historical data – average farm physical information

Year	Total usable area ha	Milking area ha	Water used mm/ha	Number of milking cows hd	Milking cows per useable area hd/ha	Milk sold kg MS/cow	Milk sold kg MS/ha	Estimated grazed pasture* t DM/ha	Estimated conserved feed* t DM/ha	Home grown feed as % of ME consumed % of ME	Concentrate price Nominal ($/t DM)	Concentrate price Real ($/t DM)
2011–12	300	133	0.5	375	1.4	478	663	6.4	1.3	57	304	342
2012–13	329	140	0.6	349	1.2	492	608	6.9	1.3	56	323	355
2013–14	301	119	0.6	309	1.1	504	569	6.0	1.1	57	412	440
2014–15	287	128	0.5	338	1.2	506	602	6.5	1.8	58	413	434
2015–16	287	126	0.5	351	1.3	504	618	6.2	2.1	55	392	408
2016–17	263	121	0.6	326	1.3	498	646	6.9	1.6	59	357	364
2017–18	251	118	0.7	337	1.4	488	683	6	1.6	56	423	423
Average	288	126	0.6	341	1.3	495	627	6.5	1.6	57		395

*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	7.19	1.25	8.44	4.60	4.17	52	-0.32	-0.7	0.09	1.0	-0.41	-0.9
NN0003	8.11	0.58	8.69	5.28	3.61	59	-0.21	-0.6	0.47	5.4	-0.67	-3.1
NN0004	7.63	0.41	8.04	6.23	3.03	67	-1.21	-3.9	0.00	0.0	-1.21	-3.9
NN0005	7.72	0.54	8.26	3.35	3.74	47	1.17	3.9	0.00	0.0	1.17	3.9
NN0007	7.05	0.59	7.65	3.86	2.26	63	1.53	4.4	0.31	4.1	1.21	5.3
NN0008	7.42	0.92	8.34	6.34	3.70	63	-1.71	-5.5	0.00	0.0	-1.71	-5.5
NN0009	7.41	0.77	8.18	6.04	3.50	63	-1.36	-3.6	0.98	12.0	-2.34	-12.3
NN0011	7.50	0.59	8.09	4.59	3.27	58	0.23	0.4	0.46	5.7	-0.23	-0.5
NN0020	7.44	1.53	8.96	4.18	4.35	49	0.43	0.8	1.40	15.6	-0.97	-2.9
NN0021	7.47	0.37	7.84	4.82	3.30	59	-0.28	-0.5	0.32	4.1	-0.60	-1.2
NN0022	7.75	1.26	9.00	4.83	3.14	61	1.04	2.5	0.76	8.5	0.28	1.3
NN0023	7.30	0.29	7.60	4.48	4.78	48	-1.67	-2.7	0.33	4.4	-2.00	-3.5
NN0024	7.44	1.22	8.66	4.27	3.69	54	0.71	2.0	0.15	1.7	0.56	2.0
NN0025	7.91	1.02	8.94	4.88	3.43	59	0.63	1.6	0.63	7.1	0.00	0.0
NN0027	8.43	0.82	9.25	5.01	3.11	62	1.13	3.3	0.58	6.3	0.55	3.3
NN0029	7.52	0.45	7.97	4.10	2.78	60	1.08	3.8	0.46	5.7	0.63	3.2
NN0030	8.48	0.36	8.84	5.41	3.62	60	-0.19	-0.5	1.13	12.8	-1.32	-8.3
NN0031	7.45	0.86	8.31	4.02	2.87	58	1.42	4.2	0.21	2.5	1.21	4.5
Average	7.62	0.77	8.39	4.79	3.46	58	0.13	0.5	0.46	5.4	-0.33	-1.0

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	108	50	0.4	93	0.9	462	398	3.8	3.1
NN0003	215	89	0.6	399	1.9	377	700	3.9	3.4
NN0004	115	90	0.2	160	1.4	488	678	4.2	3.4
NN0005	193	80	0.8	290	1.5	498	748	4.2	3.4
NN0007	255	130	0.8	310	1.2	542	659	3.9	3.2
NN0008	212	130	0.4	290	1.4	517	708	3.9	3.3
NN0009	238	96	0.6	470	2.0	458	904	3.6	3.2
NN0011	260	140	0.6	360	1.4	439	607	4.8	3.8
NN0020	177	65	0.5	180	1.0	431	438	4.0	3.2
NN0021	88	50	0.7	156	1.8	503	892	4.8	3.7
NN0022	188	79	0.4	275	1.5	376	550	3.9	3.2
NN0023	85	36	0.5	90	1.1	412	436	3.9	3.3
NN0024	237	130	0.7	280	1.2	454	537	3.8	3.2
NN0025	260	120	0.6	430	1.7	501	829	4.0	3.1
NN0027	188	100	0.5	415	2.2	497	1098	4.0	3.3
NN0029	135	60	0.8	215	1.6	514	818	4.3	3.4
NN0030	95	81	0.6	222	2.3	377	885	3.9	3.3
NN0031	343	158	0.9	550	1.6	417	670	4.8	3.5
Average	**188**	**94**	**0.6**	**288**	**1.5**	**459**	**698**	**4.1**	**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	5.3	1.3	67	100.2	7.8	2.8	15.6	57	26,216
NN0003	7.5	0.1	66	133.6	21.0	17.9	19.9	70	26,469
NN0004	3.8	0.1	38	50.0	39.6	39.7	16.0	61	29,907
NN0005	11.0	1.2	66	244.3	7.9	29.1	14.7	60	29,695
NN0007	8.1	1.5	65	92.0	0.0	0.0	0.0	73	39,709
NN0008	4.2	0.7	41	264.9	46.8	34.4	10.1	69	35,774
NN0009	3.4	2.0	33	50.0	5.0	4.2	2.5	67	30,724
NN0011	5.3	2.4	73	270.1	4.3	1.8	1.8	78	34,320
NN0020	6.6	1.7	66	95.7	4.0	12.7	5.7	64	27,381
NN0021	1.5	6.5	45	103.1	7.8	30.9	12.9	75	37,488
NN0022	8.4	0.0	56	256.9	0.0	0.0	0.0	103	38,825
NN0023	7.9	0.0	65	89.9	1.9	30.9	37.8	53	21,822
NN0024	5.9	1.1	63	137.6	21.5	23.9	16.6	71	32,237
NN0025	10.9	0.0	61	163.7	53.1	59.9	19.8	68	34,267
NN0027	10.3	0.0	44	320.3	25.5	16.0	8.5	71	35,093
NN0029	11.6	0.8	63	224.8	20.7	35.7	42.4	75	38,623
NN0030	6.7	0.0	50	119.5	29.2	16.8	5.8	74	27,907
NN0031	9.3	1.0	70	221.4	8.8	68.6	1.6	76	31,520
Average	**7.1**	**1.6**	**57**	**163.2**	**16.9**	**23.6**	**12.9**	**70**	**32,110**

*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	Percent of total energy imported
	t DM/hd	$/t DM	$/t DM	$/t DM	$/t DM	$/t DM	% of ME
NN0002	1.6	558				558	33
NN0003	1.9	383	25	83		344	34
NN0004	4.0	517	257	372		459	62
NN0005	2.1	392		344	674	398	34
NN0007	2.2	596				596	35
NN0008	4.0	368	554	424		394	59
NN0009	4.0	353		300		337	67
NN0011	1.4	385				385	27
NN0020	2.3	452		385	284	429	34
NN0021	3.1	385				385	55
NN0022	2.6	443	236	353	279	361	44
NN0023	2.0	339		355		344	35
NN0024	1.9	376		404		385	37
NN0025	2.4	458		415		447	39
NN0027	2.7	379		391		381	56
NN0029	2.2	473	168	318		384	37
NN0030	2.3	611		412		553	50
NN0031	1.6	490				490	30
Average	**2.5**	**442**	**248**	**350**	**413**	**424**	**43**

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	0.11	0.21	0.00	0.16	0.23	0.70	0.52	0.16	0.04
NN0003	0.14	0.12	0.12	0.18	0.11	0.67	0.70	0.00	0.79
NN0004	0.23	0.12	0.06	0.23	0.19	0.83	0.35	0.00	0.26
NN0005	0.15	0.21	0.02	0.10	0.15	0.64	0.51	0.15	0.25
NN0007	0.06	0.12	0.01	0.14	0.24	0.58	0.16	0.14	0.03
NN0008	0.15	0.34	0.08	0.11	0.13	0.81	0.79	0.12	0.17
NN0009	0.16	0.26	0.01	0.14	0.18	0.76	0.19	0.48	0.15
NN0011	0.22	0.16	0.13	0.29	0.23	1.02	0.55	0.83	0.07
NN0020	0.08	0.14	0.12	0.34	0.23	0.90	0.34	0.02	0.26
NN0021	0.10	0.20	0.09	0.14	0.13	0.66	0.26	0.29	0.15
NN0022	0.00	0.22	0.10	0.12	0.16	0.60	0.56	0.13	0.00
NN0023	0.20	0.17	0.08	0.22	0.17	0.84	0.52	0.33	0.00
NN0024	0.13	0.15	0.01	0.11	0.15	0.55	0.55	0.08	0.17
NN0025	0.17	0.21	0.12	0.20	0.08	0.78	0.64	0.16	0.23
NN0027	0.15	0.19	0.04	0.12	0.11	0.60	0.39	0.18	0.05
NN0029	0.11	0.15	0.06	0.11	0.08	0.52	0.66	0.18	0.20
NN0030	0.07	0.11	0.12	0.22	0.08	0.60	0.27	0.00	0.00
NN0031	0.20	0.06	0.13	0.16	0.15	0.71	0.70	0.02	0.15
Average	**0.13**	**0.17**	**0.07**	**0.17**	**0.16**	**0.71**	**0.48**	**0.18**	**0.16**

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	0.22	0.25	0.01	0.00	2.35	0.05	0.30	3.89	4.60
NN0003	0.23	0.56	0.25	0.04	1.88	0.01	0.16	4.61	5.28
NN0004	0.06	0.39	0.00	1.24	2.92	0.24	-0.06	5.40	6.23
NN0005	0.08	0.22	0.00	0.25	1.71	0.00	-0.47	2.71	3.35
NN0007	0.06	0.26	0.00	0.00	2.46	0.03	0.14	3.29	3.86
NN0008	0.16	0.30	0.37	1.42	2.12	0.08	0.01	5.53	6.34
NN0009	0.26	0.32	0.15	0.87	2.48	0.17	0.22	5.28	6.04
NN0011	0.29	0.26	0.00	0.00	1.32	0.00	0.24	3.57	4.59
NN0020	0.16	0.15	0.03	0.23	2.14	0.00	-0.06	3.28	4.18
NN0021	0.32	0.28	0.12	0.00	2.67	0.00	0.08	4.16	4.82
NN0022	0.20	0.27	0.16	0.92	1.96	0.00	0.02	4.23	4.83
NN0023	0.15	0.41	0.15	0.78	1.68	0.00	-0.38	3.65	4.48
NN0024	0.14	0.35	0.01	0.71	1.57	0.00	0.14	3.72	4.27
NN0025	0.16	0.41	0.05	0.66	2.01	0.00	-0.21	4.10	4.88
NN0027	0.24	0.57	0.34	0.25	2.25	0.21	-0.06	4.42	5.01
NN0029	0.03	0.46	0.02	0.40	1.80	0.00	-0.17	3.58	4.10
NN0030	0.15	0.30	0.37	0.81	2.90	0.00	0.02	4.81	5.41
NN0031	0.33	0.34	0.01	0.00	2.09	0.00	-0.33	3.31	4.02
Average	**0.18**	**0.34**	**0.11**	**0.48**	**2.13**	**0.04**	**-0.02**	**4.09**	**4.79**

Appendix B **North summary tables** (continued)

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	0.20	0.22	0.49	0.31	0.94	2.25	0.43	1.49	4.17
NN0003	0.09	0.06	0.05	0.24	0.49	1.64	2.57	0.22	0.82	3.61
NN0004	0.09	0.10	0.01	0.26	0.11	1.04	1.61	0.30	1.12	3.03
NN0005	0.05	0.11	0.03	0.74	0.15	1.41	2.49	0.34	0.91	3.74
NN0007	0.04	0.04	0.03	0.14	0.10	0.66	1.02	0.27	0.98	2.26
NN0008	0.03	0.07	0.03	0.78	0.04	2.29	3.24	0.46	0.00	3.70
NN0009	0.05	0.15	0.03	0.39	0.22	1.15	1.99	0.50	1.02	3.50
NN0011	0.07	0.20	0.03	0.28	0.09	0.41	1.08	0.60	1.59	3.27
NN0020	0.12	0.17	0.05	0.71	0.19	0.62	1.86	0.63	1.86	4.35
NN0021	0.15	0.20	0.03	0.55	0.11	0.51	1.56	0.50	1.24	3.30
NN0022	0.11	0.09	0.02	0.69	0.16	0.60	1.66	0.36	1.11	3.14
NN0023	0.18	0.12	0.02	0.47	0.40	0.00	1.18	0.26	3.34	4.78
NN0024	0.06	0.13	0.07	0.62	0.36	1.19	2.42	0.30	0.97	3.69
NN0025	0.08	0.09	0.07	0.52	0.09	1.31	2.17	0.62	0.64	3.43
NN0027	0.04	0.05	0.08	0.56	0.27	1.19	2.21	0.18	0.72	3.11
NN0029	0.05	0.05	0.04	0.43	0.08	0.18	0.83	0.28	1.67	2.78
NN0030	0.11	0.08	0.15	0.36	0.23	1.01	1.95	0.37	1.30	3.62
NN0031	0.03	0.03	0.02	0.41	0.05	0.78	1.33	0.40	1.15	2.87
Average	**0.08**	**0.11**	**0.06**	**0.48**	**0.19**	**0.94**	**1.86**	**0.39**	**1.22**	**3.46**

Table B6 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
NN0002	1.2	2.4	0.0	1.8	2.7	8.0	5.9	1.8	0.4
NN0003	1.6	1.3	1.3	2.0	1.2	7.5	7.8	0.0	8.9
NN0004	2.5	1.3	0.7	2.5	2.1	9.0	3.8	0.0	2.8
NN0005	2.2	2.9	0.3	1.5	2.1	9.0	7.2	2.1	3.5
NN0007	0.9	2.0	0.1	2.3	4.0	9.4	2.6	2.3	0.5
NN0008	1.5	3.4	0.8	1.1	1.3	8.1	7.8	1.2	1.7
NN0009	1.6	2.8	0.1	1.5	1.9	7.9	1.9	5.1	1.6
NN0011	2.8	2.0	1.7	3.7	2.9	13.0	7.0	10.6	0.9
NN0020	0.9	1.6	1.4	3.9	2.7	10.6	4.0	0.3	3.0
NN0021	1.2	2.4	1.1	1.7	1.6	8.1	3.2	3.6	1.8
NN0022	0.0	2.8	1.2	1.5	2.1	7.5	7.0	1.6	0.0
NN0023	2.1	1.8	0.8	2.4	1.8	9.0	5.6	3.6	0.0
NN0024	1.6	1.9	0.1	1.4	1.9	6.9	6.9	1.0	2.2
NN0025	2.0	2.6	1.5	2.4	0.9	9.4	7.7	1.9	2.7
NN0027	1.8	2.3	0.5	1.5	1.3	7.3	4.8	2.2	0.6
NN0029	1.7	2.2	0.9	1.6	1.2	7.6	9.6	2.6	2.9
NN0030	0.8	1.2	1.3	2.5	0.9	6.6	2.9	0.0	0.0
NN0031	2.9	0.9	1.8	2.4	2.2	10.3	10.1	0.3	2.2
Average	**1.6**	**2.1**	**0.9**	**2.1**	**1.9**	**8.6**	**5.9**	**2.2**	**2.0**

	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
NN0002	2.5	2.8	0.1	0.0	26.8	0.6	3.5	44.4	52.5
NN0003	2.5	6.3	2.8	0.4	21.1	0.1	1.8	51.9	59.4
NN0004	0.6	4.3	0.0	13.4	31.5	2.6	-0.6	58.3	67.3
NN0005	1.2	3.1	0.0	3.6	24.2	0.0	-6.6	38.2	47.2
NN0007	1.0	4.3	0.0	0.0	40.2	0.5	2.2	53.7	63.1
NN0008	1.6	3.0	3.7	14.1	21.1	0.8	0.1	55.0	63.1
NN0009	2.7	3.4	1.5	9.1	26.0	1.7	2.3	55.3	63.3
NN0011	3.7	3.4	0.0	0.0	16.8	0.0	3.0	45.4	58.4
NN0020	1.9	1.7	0.4	2.7	25.1	0.0	-0.7	38.4	49.0
NN0021	3.9	3.5	1.4	0.0	32.9	0.0	1.0	51.3	59.4
NN0022	2.5	3.4	2.0	11.6	24.7	0.0	0.2	53.1	60.6
NN0023	1.6	4.5	1.6	8.5	18.2	0.0	-4.1	39.4	48.4
NN0024	1.8	4.4	0.1	8.9	19.8	0.0	1.8	46.7	53.6
NN0025	2.0	5.0	0.5	7.9	24.2	0.0	-2.6	49.3	58.8
NN0027	2.9	7.0	4.2	3.1	27.6	2.6	-0.7	54.4	61.7
NN0029	0.4	6.7	0.3	5.8	26.1	0.0	-2.5	52.0	59.6
NN0030	1.6	3.3	4.1	8.9	32.1	0.0	0.2	53.3	59.9
NN0031	4.8	4.9	0.1	0.0	30.4	0.0	-4.7	48.0	58.3
Average	**2.2**	**4.2**	**1.3**	**5.4**	**26.0**	**0.5**	**-0.4**	**49.3**	**58.0**

Table B7 Overhead costs – percentage

	Rates	Farm insurance	Motor vehicle expenses	Repairs and maintenance	Other overheads	Employed labour	Total cash overheads	Depreciation	Imputed owner/ operator and family labour	Total overheads
	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs
NN0002	1.1	2.3	2.5	5.5	3.5	10.7	25.7	4.9	17.0	47.5
NN0003	1.0	0.7	0.6	2.7	5.5	18.4	28.9	2.5	9.2	40.6
NN0004	0.9	1.1	0.1	2.9	1.2	11.2	17.4	3.2	12.1	32.7
NN0005	0.7	1.5	0.5	10.4	2.1	19.9	35.1	4.9	12.8	52.8
NN0007	0.7	0.7	0.5	2.3	1.6	10.8	16.6	4.3	15.9	36.9
NN0008	0.3	0.7	0.3	7.8	0.4	22.7	32.3	4.6	0.0	36.9
NN0009	0.5	1.5	0.4	4.1	2.3	12.1	20.9	5.2	10.6	36.7
NN0011	0.9	2.6	0.4	3.6	1.1	5.2	13.7	7.7	20.2	41.6
NN0020	1.5	2.0	0.6	8.3	2.3	7.2	21.8	7.4	21.8	51.0
NN0021	1.8	2.4	0.4	6.8	1.4	6.3	19.2	6.2	15.2	40.6
NN0022	1.4	1.1	0.2	8.6	2.1	7.5	20.9	4.5	14.0	39.4
NN0023	1.9	1.3	0.2	5.0	4.3	0.0	12.7	2.9	36.0	51.6
NN0024	0.7	1.6	0.8	7.8	4.5	14.9	30.4	3.7	12.2	46.4
NN0025	1.0	1.1	0.9	6.2	1.1	15.8	26.1	7.4	7.7	41.2
NN0027	0.5	0.7	1.0	7.0	3.4	14.7	27.2	2.2	8.9	38.3
NN0029	0.7	0.7	0.6	6.2	1.2	2.6	12.0	4.1	24.3	40.4
NN0030	1.2	0.9	1.7	4.0	2.6	11.2	21.6	4.1	14.4	40.1
NN0031	0.5	0.5	0.3	5.9	0.7	11.4	19.3	5.8	16.7	41.7
Average	**1.0**	**1.3**	**0.7**	**5.8**	**2.3**	**11.3**	**22.3**	**4.7**	**15.0**	**42.0**

Table B8 Capital structure

Farm assets			
Land value	Land value	Permanent water value	Permanent water value
$/ha	$/cow	$/ha	$/cow
Average	17,991	12,094	3,098	2,002

Other farm assets (per usable hectare)				
Plant and equipment	Livestock	Hay and grain	Other assets	Total assets
$/ha	$/ha	$/ha	$/ha	$/ha
Average	1,868	3,427	183	635	25,047

Liabilities	
Liabilities per usable hectare	Liabilities per milking cow
$/ha	$/cow
Average	5,883	3,643

Equity	
Equity per usable hectare	Average equity
$/ha	%
Average	19,818	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)
2011–12	7.13	8.02	8.04	9.04	0.35	0.39	0.29	0.33	3.17	3.57	3.81	4.29
2012–13	6.83	7.50	7.46	8.20	0.33	0.37	0.32	0.35	3.34	3.67	4.00	4.39
2013–14	7.17	7.65	8.01	8.54	0.30	0.32	0.37	0.40	3.68	3.93	4.35	4.64
2014–15	7.62	8.01	8.61	9.05	0.35	0.36	0.36	0.38	3.78	3.97	4.48	4.71
2015–16	7.65	7.96	8.46	8.81	0.34	0.36	0.31	0.32	3.61	3.75	4.26	4.43
2016–17	7.28	7.43	8.25	8.43	0.35	0.36	0.31	0.32	3.46	3.53	4.12	4.21
2017–18	7.62	7.62	8.39	8.39	0.38	0.38	0.33	0.33	4.09	4.09	4.79	4.79
Average		7.74		8.64		0.36		0.35		3.79		4.49

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
2011–12	1.76	1.99	1.44	1.62	3.20	3.60	1.03	1.15	0.45	0.50	0.58	0.65	3.0	2.2
2012–13	1.99	2.18	1.26	1.38	3.25	3.57	0.22	0.24	0.58	0.64	-0.36	-0.40	0.7	-1.6
2013–14	2.02	2.16	1.34	1.43	3.36	3.59	0.29	0.31	0.64	0.68	-0.34	-0.37	0.8	-1.7
2014–15	1.87	1.96	1.45	1.52	3.31	3.48	0.82	0.86	0.63	0.66	0.19	0.20	1.9	0.4
2015–16	1.96	2.04	1.62	1.69	3.58	3.73	0.62	0.65	0.53	0.55	0.09	0.09	1.6	-0.1
2016–17	1.92	1.96	1.46	1.49	3.38	3.45	0.75	0.76	0.52	0.53	0.23	0.24	1.8	0.8
2017–18	1.86	1.86	1.61	1.61	3.46	3.46	0.13	0.13	0.46	0.46	-0.33	-0.33	0.5	-1.0
Average		2.02		1.53		3.56		0.59		0.57		0.01	1.5	-0.2

Table B10 Historical data – average farm physical information

Year	Total usable area ha	Milking area ha	Total water use efficiency t DM/100mm/ha	Number of milking cows hd	Milking cows per useable area hd/ha	Milk sold kg MS/cow	Milk sold kg MS/ha	Estimated grazed pasture* t DM/ha	Estimated conserved feed* t DM/ha	Home grown feed as % of ME consumed % of ME	Concentrate price Nominal ($/t DM)	Real ($/t DM)
2011–12	250	109	0.4	300	1.3	461	598	5.9	1.8	62	307	346
2012–13	335	130	0.5	361	1.3	460	615	7.4	1.4	58	335	368
2013–14	231	102	0.6	272	1.2	471	590	5.8	1.2	60	444	473
2014–15	215	95	0.5	259	1.3	477	606	6.4	1.8	59	434	456
2015–16	210	94	0.5	289	1.4	463	636	5.9	2.3	52	401	417
2016–17	188	88	0.5	259	1.4	477	680	7.2	1.5	62	376	384
2017–18	188	94	0.6	288	1.5	459	698	7.1	1.6	57	442	442
Average	231	102	0.5	290	1.4	467	632	6.5	1.7	59		412

*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	7.29	1.36	8.65	5.61	3.07	65	-0.04	-0.1	1.17	13.6	-1.21	-3.7
SN0006	7.33	0.63	7.96	4.03	2.63	61	1.29	3.5	1.00	12.6	0.29	1.9
SN0009	6.31	0.58	6.89	4.48	2.71	62	-0.30	-0.5	0.98	14.3	-1.28	-2.8
SN0012	7.40	0.90	8.30	3.86	3.09	56	1.35	5.4	0.56	6.7	0.80	5.5
SN0014	5.81	0.76	6.57	3.21	1.91	63	1.45	7.1	0.48	7.3	0.97	10.1
SN0016	6.70	0.37	7.07	3.37	3.29	51	0.41	1.3	0.39	5.5	0.03	0.1
SN0017	6.33	0.27	6.60	3.35	3.86	46	-0.62	-1.3	0.00	0.0	-0.62	-1.3
SN0020	7.48	0.51	7.99	4.14	2.04	67	1.80	5.8	0.21	2.7	1.59	6.5
SN0021	5.42	0.57	5.99	4.08	1.86	69	0.05	0.2	0.02	0.3	0.03	0.1
SN0023	6.19	0.58	6.78	4.25	2.35	64	0.18	0.7	0.38	5.6	-0.20	-1.1
SN0024	7.23	0.73	7.96	4.73	2.43	66	0.81	1.4	0.79	9.9	0.02	0.2
SN0025	7.33	0.99	8.31	4.83	3.70	57	-0.22	-0.4	0.72	8.7	-0.94	-2.1
SN0026	7.00	0.63	7.63	4.32	2.91	60	0.40	1.2	1.26	16.6	-0.86	-9.9
SN0027	7.54	0.65	8.18	4.53	2.04	69	1.61	5.4	0.19	2.3	1.42	5.3
Average	**6.81**	**0.68**	**7.49**	**4.20**	**2.71**	**61**	**0.58**	**2.1**	**0.58**	**7.6**	**0.00**	**0.6**

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	0.4	300	1.5	550	830	3.9	3.3
SN0006	223	71	0.9	286	1.3	535	687	3.8	3.2
SN0009	280	92	0.6	290	1.0	459	476	4.0	3.3
SN0012	318	101	1.0	390	1.2	520	637	3.9	3.2
SN0014	550	185	0.7	360	0.7	619	405	4.0	3.4
SN0016	510	277	0.5	420	0.8	474	390	4.1	3.4
SN0017	180	75	0.6	132	0.7	586	429	4.3	3.4
SN0020	367	219	0.8	655	1.8	559	997	3.5	3.1
SN0021	1,030	434	1.0	1,332	1.3	512	662	5.0	3.9
SN0023	110	82	1.1	187	1.7	456	776	3.9	3.3
SN0024	214	124	0.7	250	1.2	488	570	3.7	3.3
SN0025	172	28	1.0	249	1.4	571	827	3.7	3.3
SN0026	185	100	0.9	330	1.8	522	932	5.2	3.8
SN0027	318	201	0.4	430	1.4	512	692	4.2	3.4
Average	333	149	0.8	401	1.3	526	665	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	5.7	0.0	22	61.4	11.6	14.7	4.0	70	38,502
SN0006	9.8	0.0	61	90.4	21.0	22.7	22.3	94	50,542
SN0009	5.7	0.0	44	41.0	5.5	0.0	1.6	84	38,380
SN0012	8.2	1.6	54	47.2	10.7	20.4	2.0	66	34,285
SN0014	3.9	2.1	70	60.9	12.0	2.1	1.9	103	63,547
SN0016	3.6	0.5	61	31.0	6.6	17.8	3.8	66	31,147
SN0017	2.8	1.2	65	24.9	2.2	10.2	2.2	54	31,764
SN0020	5.9	0.6	35	102.8	0.0	43.6	0.0	89	49,980
SN0021	6.9	0.9	79	362.1	82.5	44.3	33.0	133	67,872
SN0023	6.0	2.4	62	174.0	18.7	0.0	23.4	90	41,215
SN0024	4.8	0.1	46	78.0	10.3	0.0	0.8	97	47,103
SN0025	10.8	0.0	54	28.1	14.9	29.6	1.1	76	43,691
SN0026	2.2	4.4	65	118.2	5.7	11.4	4.8	75	39,022
SN0027	2.2	1.9	51	145.5	23.6	0.0	5.1	90	46,129
Average	5.6	1.6	55	97.6	16.1	15.5	7.6	85	44,513

*On milking area

Appendix C South summary tables (continued)

Table C3 Purchased feed

Farm number	Purchased feed per milker	Concentrate price	Silage price	Hay price	Other feed price	Average purchased feed price	Percent of total energy imported
	t DM/hd	$/t DM	$/t DM	$/t DM	$/t DM	$/t DM	% of ME
SN0002	4.4	360		299		344	78
SN0006	2.8	372		256		352	39
SN0009	4.0	335		200		271	56
SN0012	3.3	365	97	184		294	46
SN0014	2.1	380		211		366	30
SN0016	2.5	374		354		370	39
SN0017	2.4	490				490	35
SN0020	4.0	359		393		373	65
SN0021	1.1	284		166		278	21
SN0023	1.6	419		353		396	38
SN0024	3.3	465	334	370		424	54
SN0025	3.4	541		356	580	467	46
SN0026	1.7	402		231		369	35
SN0027	2.7	420		210	401	395	49
Average	**2.8**	**398**	**215**	**276**	**491**	**371**	**45**

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	0.10	0.15	0.17	0.09	0.16	0.67	0.19	0.07	0.00
SN0006	0.17	0.25	0.14	0.12	0.12	0.80	0.31	0.13	0.31
SN0009	0.14	0.17	0.01	0.26	0.12	0.70	0.12	0.03	0.01
SN0012	0.17	0.16	0.13	0.10	0.03	0.58	0.23	0.26	0.08
SN0014	0.13	0.24	0.01	0.09	0.06	0.53	0.50	0.77	0.32
SN0016	0.11	0.14	0.03	0.09	0.09	0.47	0.28	0.21	0.03
SN0017	0.08	0.04	0.06	0.13	0.15	0.45	0.21	0.25	0.24
SN0020	0.09	0.09	0.02	0.10	0.11	0.41	0.16	0.00	0.06
SN0021	0.07	0.09	0.05	0.12	0.06	0.39	0.56	0.94	0.46
SN0023	0.07	0.05	0.00	0.11	0.14	0.38	0.42	0.24	0.18
SN0024	0.32	0.16	0.15	0.10	0.05	0.78	0.20	0.00	0.03
SN0025	0.11	0.31	0.04	0.20	0.11	0.76	0.28	0.00	0.38
SN0026	0.17	0.16	0.04	0.18	0.08	0.63	0.19	0.34	0.35
SN0027	0.11	0.09	0.03	0.09	0.10	0.41	0.42	0.21	0.25
Average	**0.13**	**0.15**	**0.06**	**0.13**	**0.10**	**0.57**	**0.29**	**0.25**	**0.19**

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	0.18	0.10	0.06	1.05	3.44	0.00	-0.16	4.94	5.61
SN0006	0.17	0.17	0.31	0.27	1.83	0.00	-0.27	3.23	4.03
SN0009	0.24	0.21	0.24	1.00	1.87	0.00	0.08	3.78	4.48
SN0012	0.17	0.29	0.11	0.37	1.55	0.16	0.06	3.28	3.86
SN0014	0.12	0.21	0.01	0.06	1.15	0.00	-0.45	2.68	3.21
SN0016	0.04	0.17	0.01	0.33	1.69	0.00	0.13	2.90	3.37
SN0017	0.09	0.11	0.01	0.00	2.09	0.00	-0.10	2.91	3.35
SN0020	0.08	0.17	0.00	1.34	1.83	0.14	-0.06	3.73	4.14
SN0021	0.15	0.28	0.04	0.02	0.62	0.10	0.51	3.70	4.08
SN0023	0.07	0.43	0.06	0.72	1.57	0.34	-0.15	3.88	4.25
SN0024	0.08	0.23	0.09	0.96	2.34	0.22	-0.18	3.94	4.73
SN0025	0.13	0.20	0.10	0.92	1.85	0.08	0.14	4.06	4.83
SN0026	0.13	0.29	0.45	0.17	1.27	0.06	0.43	3.69	4.32
SN0027	0.12	0.35	0.04	0.13	2.21	0.14	0.23	4.11	4.53
Average	**0.13**	**0.23**	**0.11**	**0.52**	**1.81**	**0.09**	**0.02**	**3.63**	**4.20**

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	0.13	0.10	0.04	0.56	0.12	0.36	1.32	0.41	1.34	3.07
SN0006	0.04	0.14	0.07	0.28	0.15	1.08	1.75	0.58	0.30	2.63
SN0009	0.07	0.09	0.18	0.23	0.19	0.73	1.48	0.42	0.81	2.71
SN0012	0.04	0.07	0.17	0.32	0.12	1.35	2.08	0.44	0.57	3.09
SN0014	0.02	0.07	0.06	0.28	0.20	0.30	0.93	0.24	0.74	1.91
SN0016	0.08	0.10	0.11	0.20	0.08	1.17	1.73	0.45	1.11	3.29
SN0017	0.19	0.09	0.05	0.87	0.08	1.28	2.56	0.36	0.94	3.86
SN0020	0.09	0.06	0.03	0.28	0.06	0.83	1.36	0.19	0.50	2.04
SN0021	0.03	0.05	0.06	0.31	0.05	0.66	1.17	0.30	0.39	1.86
SN0023	0.03	0.10	0.12	0.23	0.16	0.24	0.88	0.09	1.38	2.35
SN0024	0.12	0.07	0.06	0.31	0.17	0.72	1.45	0.15	0.82	2.43
SN0025	0.11	0.14	0.05	0.75	0.19	0.33	1.56	0.86	1.28	3.70
SN0026	0.02	0.13	0.03	0.25	0.20	1.13	1.75	0.56	0.60	2.91
SN0027	0.05	0.05	0.01	0.14	0.09	0.52	0.86	0.22	0.97	2.04
Average	**0.07**	**0.09**	**0.07**	**0.36**	**0.13**	**0.76**	**1.49**	**0.38**	**0.84**	**2.71**

Table C6 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
SN0002	1.2	1.8	1.9	1.0	1.8	7.7	2.2	0.8	0.0
SN0006	2.6	3.8	2.0	1.8	1.7	12.0	4.6	1.9	4.7
SN0009	2.0	2.4	0.1	3.6	1.7	9.7	1.6	0.4	0.1
SN0012	2.4	2.3	1.8	1.4	0.4	8.4	3.4	3.7	1.1
SN0014	2.5	4.6	0.2	1.8	1.3	10.4	9.7	15.1	6.2
SN0016	1.7	2.2	0.5	1.4	1.4	7.1	4.2	3.1	0.5
SN0017	1.1	0.5	0.8	1.7	2.0	6.2	2.9	3.5	3.3
SN0020	1.4	1.5	0.4	1.6	1.8	6.7	2.6	0.0	1.0
SN0021	1.2	1.4	0.8	2.0	1.1	6.5	9.5	15.7	7.8
SN0023	1.1	0.7	0.1	1.7	2.1	5.7	6.4	3.6	2.7
SN0024	4.5	2.3	2.0	1.4	0.8	11.0	2.7	0.0	0.4
SN0025	1.3	3.6	0.4	2.4	1.2	8.9	3.2	0.0	4.4
SN0026	2.4	2.2	0.6	2.5	1.1	8.8	2.7	4.7	4.8
SN0027	1.7	1.4	0.4	1.4	1.5	6.3	6.4	3.3	3.8
Average	**1.9**	**2.2**	**0.9**	**1.8**	**1.4**	**8.2**	**4.4**	**4.0**	**2.9**

	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	2.1	1.1	0.7	12.0	39.6	0.0	-1.8	56.9	64.6
SN0006	2.6	2.6	4.7	4.0	27.5	0.0	-4.0	48.5	60.5
SN0009	3.4	2.9	3.3	13.9	26.0	0.0	1.1	52.6	62.3
SN0012	2.4	4.2	1.6	5.3	22.4	2.3	0.8	47.2	55.5
SN0014	2.3	4.2	0.1	1.2	22.5	0.0	-8.9	52.3	62.7
SN0016	0.7	2.6	0.1	5.0	25.4	0.0	1.9	43.5	50.6
SN0017	1.3	1.6	0.2	0.0	28.9	0.0	-1.3	40.3	46.5
SN0020	1.3	2.8	0.0	21.6	29.7	2.3	-0.9	60.3	67.0
SN0021	2.6	4.8	0.7	0.3	10.5	1.7	8.6	62.2	68.7
SN0023	1.1	6.5	0.9	10.9	23.8	5.1	-2.2	58.7	64.5
SN0024	1.1	3.2	1.2	13.4	32.6	3.1	-2.5	55.1	66.1
SN0025	1.5	2.3	1.2	10.8	21.7	0.9	1.6	47.6	56.6
SN0026	1.8	4.0	6.2	2.4	17.6	0.8	6.0	51.0	59.8
SN0027	1.9	5.4	0.6	2.0	33.7	2.1	3.5	62.6	68.9
Average	**1.9**	**3.4**	**1.5**	**7.3**	**25.8**	**1.3**	**0.1**	**52.8**	**61.0**

Appendix C **South summary tables** (continued)

Table C7 Overhead costs – percentage

	Rates	Farm insurance	Motor vehicle expenses	Repairs and maintenance	Other overheads	Employed labour	Total cash overheads	Depreciation	Imputed owner/ operator and family labour	Total overheads
	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs
SN0002	1.4	1.2	0.5	6.5	1.4	4.2	15.2	4.8	15.5	35.4
SN0006	0.6	2.0	1.1	4.1	2.2	16.2	26.2	8.7	4.6	39.5
SN0009	0.9	1.3	2.4	3.2	2.6	10.1	20.6	5.8	11.3	37.7
SN0012	0.6	1.1	2.4	4.6	1.8	19.4	29.9	6.3	8.3	44.5
SN0014	0.5	1.4	1.1	5.4	3.9	5.9	18.2	4.7	14.4	37.3
SN0016	1.2	1.4	1.6	3.0	1.2	17.5	25.9	6.8	16.7	49.4
SN0017	2.6	1.3	0.7	12.0	1.1	17.8	35.5	5.0	13.0	53.5
SN0020	1.5	0.9	0.5	4.6	1.0	13.5	21.9	3.0	8.0	33.0
SN0021	0.5	0.9	1.0	5.3	0.9	11.2	19.7	5.0	6.6	31.3
SN0023	0.5	1.5	1.8	3.5	2.5	3.6	13.4	1.3	20.9	35.5
SN0024	1.7	1.0	0.8	4.3	2.4	10.1	20.3	2.1	11.5	33.9
SN0025	1.2	1.6	0.6	8.8	2.2	3.9	18.3	10.1	15.0	43.4
SN0026	0.3	1.8	0.4	3.4	2.7	15.6	24.2	7.7	8.3	40.2
SN0027	0.7	0.8	0.1	2.1	1.4	8.0	13.1	3.3	14.7	31.1
Average	**1.0**	**1.3**	**1.1**	**5.1**	**1.9**	**11.2**	**21.6**	**5.3**	**12.0**	**39.0**

Table C8 Capital structure

Farm assets					Other farm assets (per usable hectare)				
Land value	Land value	Permanent water value	Permanent water value		Plant and equipment	Livestock	Hay and grain	Other assets	Total assets
$/ha	$/cow	$/ha	$/cow		$/ha	$/ha	$/ha	$/ha	$/ha
Average	17,067	12,031	1,891	1,716	1,670	2,970	375	651	22,271

Liabilities			Equity	
Liabilities per usable hectare	Liabilities per milking cow		Equity per usable hectare	Average equity
$/ha	$/cow		$/ha	%
Average	7,415	5,550	15,915	72

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)
2011–12	6.64	7.47	7.48	8.41	0.31	0.35	0.25	0.28	2.86	3.22	3.42	3.85
2012–13	6.03	6.63	6.95	7.63	0.32	0.36	0.24	0.26	3.01	3.31	3.57	3.93
2013–14	7.12	7.59	7.98	8.52	0.32	0.34	0.21	0.23	3.20	3.41	3.73	3.98
2014–15	7.28	7.65	8.25	8.66	0.30	0.31	0.21	0.23	3.28	3.45	3.79	3.98
2015–16	6.97	7.25	7.94	8.27	0.35	0.37	0.21	0.22	3.01	3.13	3.57	3.71
2016–17	6.48	6.62	7.62	7.78	0.40	0.41	0.22	0.22	3.07	3.13	3.68	3.76
2017–18	6.81	6.81	7.49	7.49	0.34	0.34	0.23	0.23	3.63	3.63	4.20	4.20
Average		7.15		8.11		0.35		0.24		3.32		3.92

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
2011–12	1.35	1.52	1.05	1.18	2.40	2.70	1.65	1.85	0.73	0.82	0.92	1.04	5.5	4.9
2012–13	1.44	1.58	1.12	1.23	2.56	2.81	0.81	0.89	0.66	0.72	0.15	0.17	2.7	0.5
2013–14	1.54	1.64	1.16	1.23	2.69	2.87	1.56	1.66	0.61	0.65	0.95	1.01	4.8	1.2
2014–15	1.52	1.60	1.02	1.08	2.55	2.68	1.91	2.01	0.56	0.58	1.35	1.42	5.3	5.7
2015–16	1.49	1.55	1.17	1.21	2.66	2.77	1.72	1.79	0.55	0.57	1.17	1.21	4.7	4.7
2016–17	1.67	1.71	1.16	1.18	2.83	2.89	1.10	1.12	0.51	0.52	0.59	0.60	2.7	2.1
2017–18	1.49	1.49	1.22	1.22	2.71	2.71	0.58	0.58	0.58	0.58	0.00	0.00	2.1	0.6
Average		1.59		1.19		2.78		1.42		0.64		0.78	4.0	2.8

Table C10 Historical data – average farm physical information

Year	Total usable area (ha)	Milking area (ha)	Total water use efficiency (t DM/100mm/ha)	Number of milking cows (hd)	Milking cows per useable area (hd/ha)	Milk sold (kg MS/cow)	Milk sold (kg MS/ha)	Estimated grazed pasture* (t DM/ha)	Estimated conserved feed* (t DM/ha)	Home grown feed as % of ME consumed (% of ME)	Concentrate price Nominal ($/t DM)	Concentrate price Real ($/t DM)
2011–12	351	156	0.5	450	1.5	495	728	6.8	0.9	52%	301	339
2012–13	323	151	0.6	337	1.1	523	601	6.5	1.2	55%	311	341
2013–14	381	139	0.6	350	1.0	541	546	6.2	1.0	54%	377	402
2014–15	372	165	0.6	430	1.1	540	597	6.7	1.8	57%	389	408
2015–16	379	164	0.6	425	1.1	552	597	6.5	1.9	57%	382	398
2016–17	343	155	0.6	396	1.2	520	611	6.5	1.7	57%	336	344
2017–18	333	149	0.8	401	1.3	526	665	5.6	1.6	55%	398	398
Average	354	154	0.6	399	1.2	528	621	6.4	1.4	55%		376

*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

Term	Definition
All other income	Income to the farm from all sources except milk. Includes livestock trading profit, dividends, interest payments received, and rent from farm cottages.
Appreciation	An increase in the value of an asset in the market place. Often only applicable to land value.
Asset	Anything managed by the farm, whether it is owned or not. Assets include owned land and buildings, leased land, plant and machinery, fixtures and fittings, trading stock, farm investments (i.e. Farm Management Deposits), debtors, and cash.
Cash overheads	All fixed costs that have a cash cost to the business. Includes all overhead costs except imputed labour costs and depreciation.
Cost of production	The cost of producing the main product of the business; milk. Usually expressed in terms of the main enterprise output i.e. dollars per kilogram of milk solids. It is reported at the following levels; › Cash cost of production; variable costs plus cash overhead costs › Cost of production excluding inventory changes; variable costs plus cash and non-cash overhead costs › Cost of production including inventory changes; variable costs plus cash and non-cash overhead costs, accounting for feed inventory change and livestock inventory change minus livestock purchases
Cost structure	Variable costs as a percentage of total costs, where total costs equal variable costs plus overhead costs.
Debt servicing ratio	Interest and lease costs as a percentage of gross farm income.
Depreciation	Decrease in value over time of capital asset, usually as a result of using the asset. Depreciation is a non-cash cost of the business, but reduces the book value of the asset and is therefore a cost.
Earnings before interest and tax (EBIT)	Gross farm income minus total variable and total overhead costs.
Employed labour cost	Cash cost of any paid employee, including on-costs such as superannuation and WorkCover.
Equity	Total assets minus total liabilities. Equal to the total value of capital invested in the farm business by the owner/ operator(s).
Equity %	Total equity as a percentage of the total assets owned. The proportion of the total assets owned by the business.
Feed costs	Cost of fertiliser, irrigation (including effluent), hay and silage making, fuel and oil, pasture improvement, fodder purchases, grain/ concentrates, agistment, lease costs associated with any of the above costs, and feed inventory change.
Feed inventory change	An estimate of the feed on hand at the start and end of the financial year to capture feed used in the production of milk and livestock.
Finance costs	See interest and lease costs.
Full time equivalent (FTE)	Standardised labour unit. Equal to 2,400 hours a year. Calculated as 48 hours a week for 50 weeks a year.
Grazed pasture	Calculated using the energetics method. Grazed pasture is calculated as the gap between total metabolisable energy required by livestock over the year and amount of metabolisable energy available from other sources (hay, silage, grain and concentrates). Total metabolisable energy required by livestock is a factor of age, weight, growth rate, pregnancy and lactation requirements, distance to shed, terrain and number of animals. Total metabolisable energy available is the sum of energy available from all feed sources except pasture, calculated as (weight (kg) x dry matter content (DM %) x metabolisable energy (MJ/kg DM)).
Gross farm income	Farm income including milk sales net of levies and charges, livestock trading profit and other farm income, exclusive of GST.
Gross margin	Gross farm income minus total variable costs.
Herd costs	Cost of artificial insemination (AI) and herd tests, animal health and calf rearing.
Imputed	An estimated amount, introduced into economic management analysis to allow reasonable comparisons between years and between other businesses.
Imputed labour cost	An allocated allowance for the cost of owner/ operator, family and sharefarmer time in the business, valued at $30.33 per hour.
Interest and lease costs	Total interest plus total lease costs paid.
Labour cost	Cost of the labour resource on farm. Includes both imputed and employed labour costs.
Labour efficiency	FTEs per cow and per kilogram of milk solids sold. Measures of productivity of the total labour resources in the business.
Labour resource	Any person who works in the business, be they the owner, family, sharefarmer or employed on a permanent, part time or contract basis.
Liability	Money owed to someone else, e.g. family or a financial institute such as a bank.
Livestock trading profit	An estimate of the annual contribution to gross farm income by accounting for the changes in the number and value of livestock during the year. It is calculated as the trading income from sales minus purchases, plus changes in the value and number of livestock on hand at the start and end of the year, and accounting for births and deaths. An increase in livestock trading indicates there was an appreciation of livestock or an increase in livestock numbers over the year.
Metabolisable energy	Energy available to livestock in feed, expressed in megajoules per kilogram of dry matter (MJ/kg DM).

Milk income	Income through the sales of milk. This is net of compulsory levies and charges.
Milking area	Total usable area minus out-blocks or run-off areas.
Net farm income	Earnings before interest and tax (EBIT) minus interest and lease costs. The amount of profit available for capital investment, loan principal repayments and tax.
Nominal terms	Dollar values or interest rates that include an inflation component.
Number of milkers	Total number of cows milked for at least three months.
Other income	Income to the farm from other farm owned assets and farm business related external sources. Includes milk factory dividends, interest payments received, and rents from farm cottages.
Overhead costs	All fixed costs incurred by the farm business that do not vary with the level of production. These include cash overhead costs such as employed labour and non-cash costs such as imputed owner-operator labour, family labour and depreciation of plant and equipment. It excludes interest, lease costs, capital expenditure, principal repayments, drawings and tax.
Real terms	Dollar values or interest rates that have no inflation component.
Return on equity (RoE)	Net farm income divided by the value of total equity.
Return on total assets (RoTA)	Earnings before interest and tax divided by the value of total assets under management, including owned and leased land.
Shed costs	Cost of shed power and dairy supplies such as filter socks, rubberware, vacuum pump oil etc.
Total usable area	Total hectares managed minus the area of land which is of little or no value for livestock production e.g. house and shed area.
Total water use efficiency	Home grown feed consumed or harvested per 100 mm water applied (rainfall and irrigation) to the usable hectares on the farm.
Variable costs	All costs that vary with the size of production in the enterprise e.g. herd, shed and feed costs (including feed and water inventory changes).
Water inventory change	An estimate of the irrigation water on hand at the start and end of the financial year to capture water used in the production of pasture and crops.

List of abbreviations

AI	Artificial insemination
CH_4	Methane gas
CO_2	Carbon dioxide gas
CO_2-e	Carbon dioxide equivalent
CoP	Cost of production
DFMP	Dairy Farm Monitor Project
DM	Dry matter of feed stuffs
EBIT	Earnings before interest and tax
FTE	Full time equivalent.
GWP	Global Warming Potential
ha	Hectare(s)
hd	Head of cattle
HRWS	High Reliability Water Shares
kg	Kilograms
LRWS	Low Reliability Water Shares.

ME	Metabolisable energy (MJ/kg)
MJ	Megajoules of energy
mm	Millimetres. 1 mm is equivalent to 4 points or $\frac{1}{25}$ of an inch of rainfall
MS	Milk solids (proteins and fats)
N_2O	Nitrous oxide gas
Q1	First quartile, i.e. the value of which one quarter, or 25%, of data in that range is less than
Q3	Third quartile, i.e. the value of which one quarter, or 25%, of data in that range is greater than
RoTA	Return on total assets
RoE	Return on equity
t	Tonne = 1,000 kg
Top 25%	The state average for the top 25% of farms ranked by return on total assets.

Standard values

Irrigation values

The standard values to estimate the inventory values of irrigation water were as below.

Category	Opening value ($/ML)	Closing value ($/ML)
HRWS	1,012	1,250
LRWS	230	230
Carry over water	200	200

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
14–15 heifers	1,200	1,600
15–16 heifers	600	1,200
16–17 calves		600
Mature bulls	2,400	2,400

Imputed owner/operator and family labour

In 2017–18 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.