

DAIRY FARM MONITOR PROJECT

NEW SOUTH WALES ANNUAL REPORT 2019/20



ACKNOWLEDGEMENTS

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

The project is conducted by NSW Department of Primary Industries, managed by Sheena Carter, Development Officer – Dairy Farm Business. The success of the project was made possible this year through the contributions of Julie Dart from North Coast Local Land Services; Hayden Kingston from South East Local Land Services; Alicia Richters from Subtropical Dairy, Elizabeth Warren from Dairy NSW; contractors Tom Farran, Cameron Smith, Scott Barnett, Rob Cooper and Andrew Ellem; Nicolas Lyons, NSW DPI Dairy Team Leader and Peter Havrlant, Dairy Development Officer with NSW DPI; and Juan Gargiulo, The University of Sydney. These people collected farm data and provided feedback and validation to ensure the accuracy and integrity of the information.

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

This report has been produced by Sheena Carter, in conjunction with Dairy Australia.

This document is also available in PDF format on the internet at dairyaustralia.com.au/dairyfarmmonitoranddpi.nsw.gov.au/animals-and-livestock/dairy/dairy-business-advisory-unit

Further information regarding the Dairy Farm Monitor Project may be obtained from:

Sheena Carter

Development Officer – Dairy Farm Business Management
NSW Department of Primary Industries
c/- Hunter LLS Office
Scone TAFE, 2 Flemington Drive
Scone, NSW. 2337

0488 277 133

sheena.carter@dpi.nsw.gov.au

Helen Quinn

Program Manager – Farm Business Management
Dairy Australia
Level 3, HWT Tower
40 City Road
Southbank, Victoria 3006

03 9694 3777

hquinn@dairyaustralia.com.au



CONTENTS

List of figures and tables	2
How to read this report	3
What's new in 2019/20?	4
Summary	5
Farm monitor method	7
Statewide overview	10
Whole farm analysis	12
Physical measures	16
The North	18
The South	25
Business confidence survey	32
Greenhouse gas emissions	35
Historical analysis	38
Appendices	41

LIST OF FIGURES AND TABLES

Figures

1 Dairy Farm Monitor Project method profit map – state average 2019/20 data	9	20 Estimated tonnes of home grown feed consumed per milking area hectare	24	39 2019/20 Greenhouse gas emissions per tonne of milk solids produced (CO ₂ equivalent) – North	37
2 Distribution of participant farms in 2019/20 across NSW	11	21 Nutrient application per milking area hectare	24	40 2019/20 Greenhouse gas emissions per tonne of milk solids produced (CO ₂ equivalent) – South	37
3 2019/20 monthly rainfall	11	22 2019/20 annual rainfall and long term average rainfall	26	41 Historical whole farm performance – North	39
4 Average earnings before interest and tax per kilogram of milk solids sold	15	23 Milk solids sold per hectare and per cow	27	42 Historical farm profitability (real \$) – North	39
5 Distribution of farms by return on total assets	15	24 Gross farm income per kilogram of milk solids	27	43 Historical whole farm performance – South	40
6 Distribution of farms by return on equity	15	25 Whole farm variable and overhead costs per kilogram of milk solids	27	44 Historical farm profitability (real \$) – South	40
7 Sources of whole farm metabolisable energy	16	26 Whole farm earnings before interest and tax per kilogram of milk solids	29	45 Regional historical earnings before interest and tax (real \$)	40
8 Estimated tonnes of home grown feed consumed per milking area hectare	16	27 Return on total assets	29	46 Regional historical net farm income (real \$)	40
9 Nutrient application per milking hectare	17	28 Return on equity	29	47 Regional historical return on total assets	40
10 Monthly distribution of milk solids sold	17	29 Sources of whole farm metabolisable energy	31	48 Regional historical return on equity	40
11 Monthly distribution of calves born	17	30 Estimated tonnes of home grown feed consumed per milking area hectare	31		
12 2019/20 annual rainfall and long term average rainfall	20	31 Nutrient application per milking hectare	31	Tables	
13 Milk solids sold per hectare and per cow	20	32 Expected change to farm business profit in 2020/21	33	1 Farm physical data – state overview	12
14 Gross farm income per kilogram of milk solids	20	33 Producer expectations of prices and production of milk in 2020/21	33	2 Average farm financial performance per of kilogram milk solids and cents per litre – statewide	14
15 Whole farm variable and overhead costs per kilogram of milk solids	20	34 Producer expectations for production of fodder in 2020/21	33	3 Risk indicators – statewide and by region	14
16 Whole farm earnings before interest and tax per kilogram of milk solids	22	35 Producer expectations of costs for the dairy industry in 2019/20	34	4 Farm physical data – North	19
17 Return on total assets	22	36 Major issues for individual businesses – 12 month outlook	34	5 Average farm financial performance – northern NSW	21
18 Return on equity	22	37 Major issues for individual businesses – 5 year outlook	34	6 Cost of production	21
19 Sources of whole farm metabolisable energy	24	38 2019/20 Greenhouse gas emissions per tonne of milk solids produced (CO ₂ equivalent)	36	7 Farm physical data – South	26
				8 Average farm financial performance – southern NSW	28
				9 Cost of production	29

HOW TO READ THIS REPORT

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

This report is presented in the following sections:

- Summary
- Farm monitor method
- Statewide overview
- North region overview
- South region overview
- Business confidence survey
- Greenhouse gas emissions report
- Historical analysis
- Appendices

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

The report presents visual descriptions of the data for the 2019/20 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 nine farms on a statewide basis, taken by considering all 35 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 17 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 $[(\text{new value} - \text{original value}) / \text{original value}] \times 100$. For example 'costs went from \$80/ha to \$120/ha, a 50% increase'; $[(120-80)/80] \times 100 = 50\%$, unless otherwise stated.

Any reference to 'last year' refers to the 2018/19 Dairy Farm Monitor Project report. Price and cost comparisons between years are nominal unless otherwise stated. It should be noted that not all of the participants from 2018/19 are in the 2019/20 report, 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 2019/20

The Dairy Farm Monitor Report for 2019/20 includes a couple of minor changes since last year's report.

- The number of farms in the project grew by three to thirty-five farms this year, up from thirty-two last year. There were six farms that chose not to participate this year and nine new farms that joined.
- The standard value for imputed owner operator and family labour has been revised from \$30.33 per hour to \$32.00 per hour to reflect industry rates and inflation.
- The standard values used to estimate the value of livestock, irrigation and the imputed operators allowance for labour management are detailed in Appendix D.

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



SUMMARY

In 2019/20 data collected and analysed from 35 farms across New South Wales revealed that farm business profit increased from \$0.38/kgMS to \$1.05/kgMS, equal to the third highest level in the nine years of the project.

Strong competition for milk supply saw milk prices increase by 14.7% on average. Total feed costs increased by 6.7% on average, due mainly to the continued impact of the widespread drought in NSW. Rainfall was again below average across all regions of NSW although widespread falls of rain during autumn and early winter began to ease drought conditions. Summer again delivered record high temperatures and severe bushfires in several regions, making it another very difficult season for NSW dairy farmers.

Due to the challenging operating environment in 2019/20, state milk production decreased by 3.3% over the year to 1.044 billion litres (Source: Dairy Australia).

For the farmers participating in the Dairy Farm Monitor Project, milk price in 2019/20 increased on average by 14.7% on the previous year, up from \$7.74/kg MS (57 cents/litre) to \$8.88/kgMS (65.6 cents/litre).

NSW began the 2019/20 year with 96.3% of the state in drought with stock water becoming critical in many areas during the height of summer. Regulated river systems were at crisis point with available water being relegated for critical town water supply in many instances. By January, 100% of the state was back in drought, however much of eastern NSW saw solid rainfall events in early February. By the end of the financial year the drought conditions had continued to weaken however 86.9% of the state was still in one of three drought categories by the end of June. Some regions, particularly on the coastal and southern areas, received some good falls of rain at different periods of the year. This provided some good pasture and crop growth in those areas, but rainfall was still below historical averages, with some areas missing out on follow up rain.

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

It was an incredibly challenging year for homegrown crops and pastures with only 51% of feed being consumed from the homegrown feed base across the state. It also cost them more to grow it. The autumn rains however, enabled conservation of some fodder in many areas.

Purchased grain and fodder remained costly and in tight supply, however prices started to soften. The average cost of concentrates was \$555/t DM, and the average cost of hay was \$407/t DM.

Average Earnings Before Interest and Tax (EBIT) per farm increased to \$269,897 compared to \$53,372 in 2018/19. This translates to an average EBIT of \$1.05/kgMS (7.9 c/l).

NSW dairy farmers continued to be able to access drought support payments from various sources. Those included in this analysis were freight rebates on transport of fodder, and payments from the major liquid milk retailers from sales of milk. Farms affected in bushfire areas were also able to access grants to assist with recovery efforts. Government grants were also received via the small business stimulus package in response to the coronavirus pandemic.

Whilst there was improvement in farm profit across the state there remains a notable difference in profit between the farms in the two regions.

The North

Farmers in the North improved profit this year, despite the ongoing drought. Milk prices on average increased by 16% to \$9.37/kg MS (68.4 c/l), and other farm income decreased from \$1.09/kg MS to \$0.98/kg MS.

The average cost of production (including inventory change) was 13% higher than the year before, at \$9.82/kg MS (71.3 c/l). This was mainly due to higher purchased feed costs.

Average whole farm earnings before interest and tax (EBIT) increased to \$141,281 per farm, compared to \$87,175 in 2018/19 per farm. Average return on total assets increased from 1.1% in 2018/19 to 1.7% in 2019/20.



The South

Most of the southern region also experienced lower than average rainfall throughout 2019/20.

Whilst milk prices increased by 13% over the previous year to \$8.36/kg MS, the average cost of production decreased by only 0.3% in 2019/20, to \$7.95/kgMS (59.6 c/l),

Overall this led to a large increase in EBIT to an average of \$406,079 per farm this year, up from \$15,061 the previous year. Average return on total assets for the group increased to 3.8%, up from 0.3% in 2018/19.

Farmer confidence

As 2019/20 was a year of higher profits, expectations about improving business profit remain positive for the coming year in both the northern and southern regions expecting improvements with 94% and 88% respectively. None of the northern farmers expect declining profits. 6% of northern and southern farmers anticipate stable profits.

No farmers intend to decrease milk production next year, with 56% of northern and 59% of southern farmers expecting to increase production. The remainder of farmers intend to keep production stable. This indicates positivity in the year ahead with anticipation of declining concentrate and fodder prices and stable milk prices as well as a slow rebuild in herd numbers, given the easing of the drought conditions,

The major concern facing participants in the coming 12 months and also over the next 5 year period is that of climate and seasonal conditions.

Historical analysis

A historical analysis over the past nine years of the project showed that 2019/20 finally saw a reversal in the trend in declining operating profit (EBIT per farm) seen in NSW since 2014/15 and an increase in return on total assets and equity.

FARM MONITOR METHOD

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

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

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

The DFMP method is presented as a profit map in Figure 1, which shows how the different measures are calculated. The performance of all project participants in 2019/20 is also shown.

The diagram illustrates the profit measures as costs deducted from gross farm income. Growth in profit is achieved by investing in assets which generate income. These assets can be owned with equity (one's own capital) or debt (borrowed capital). The amount of growth is dependent on maximising the margin between income and costs, or cost efficiency relative to income generation.

Gross farm income

The farming business generates a gross farm income which is the sum of milk cash income (net), livestock trading profit, or other sources of farm income.

Variable costs

Variable costs are the costs specific to an enterprise, such as herd, shed and feed costs. These costs vary in relation to the size of the enterprise. Subtracting variable costs for the dairy enterprise from gross farm income, gives the gross margin. Gross margins are often used to compare between similar enterprises and are commonly used in broad acre cropping and livestock enterprises. Gross margins are not generally used in the economic analysis of dairy farming businesses due to the specific infrastructure investment required to operate a dairy farm, making it less desirable or feasible to switch enterprise.

Overhead costs

Overhead costs are costs not directly related to an enterprise as they are expenses incurred through the general operating of the business. The DFMP separates overheads into cash and non-cash overheads, to distinguish between different cash flows within the business. Cash overheads include paid labour, rates, insurance, and repairs and maintenance. Non-cash overheads include costs that are not actual cash receipts or expenditure; for example depreciation on plant and equipment. Imputed operators' allowance for labour and management is also a non-cash overhead that must be costed and deducted from income if a realistic estimate of costs, profit and the return on the capital of the business is to be obtained.

Earnings before interest and tax

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

Net farm income

Net farm income is EBIT minus interest and lease costs and is the reward to the farmer's own capital. Interest and lease costs are viewed as financing expenses, either for borrowed money or leased land that is being utilised.

Net farm income is then used to pay tax and what is remaining is net profit or surplus and therefore growth, which can be invested into the business to expand the equity base, either by direct reinvestment or the payment of debt.



Return on total assets and return on equity

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

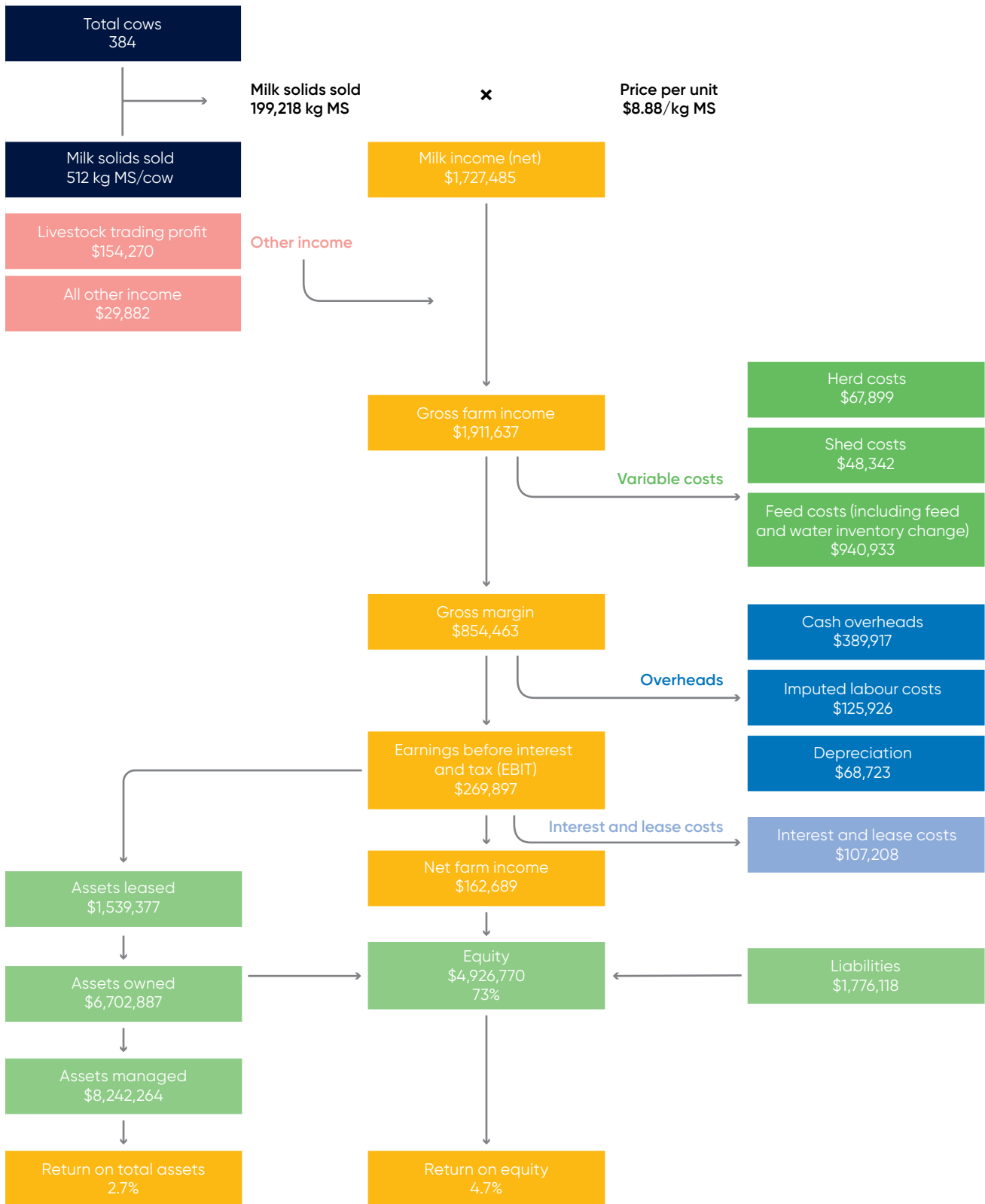
Return on total assets indicates the overall earning of the total farm assets, irrespective of capital structure of the business. It is EBIT expressed as a percentage of the total assets under management in the farm business, including the value of leased assets.

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

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

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

Figure 1 Dairy Farm Monitor Project method profit map – state average 2019/20 data, 35 farms



Statewide overview



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

NSW produces 12% of Australia's national milk supply, a total of 1.04 billion litres in 2019/20 from 553 dairy farms. 64% of milk produced in NSW was sold as liquid drinking milk, with the remainder processed for domestic and export markets. 13% of milk produced on farm in 2019/20 in NSW is estimated to have made its way to export markets (Dairy Australia).

The NSW dairy industry is spread along the coastal and hinterland regions and in irrigated inland river valleys.

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

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

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

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

Figure 2 Distribution of participant farms in 2019/20 across NSW



2019/20 Seasonal conditions

NSW began the 2019/20 year with 96.3% of the state continuing to experience widespread and long term drought conditions. By the end of the year, conditions were beginning to ease. Rainfall for the year was again below average across the state.

The drought conditions throughout the first half of the year continued to put immense pressure on water storage in both regulated and unregulated systems and on farm.

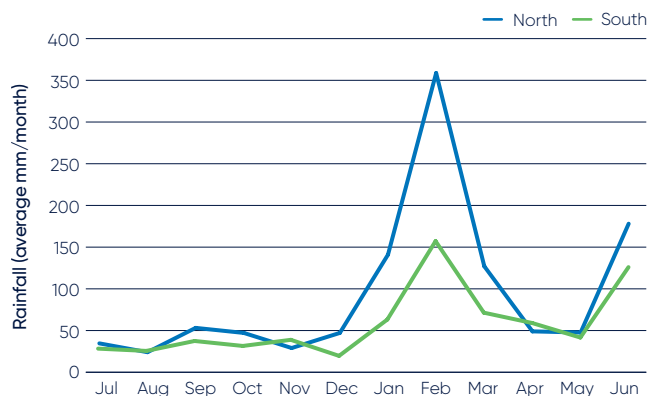
Late summer and early autumn brought some significant falls of rain to much of the state, particularly in the north eastern, central and coastal parts of NSW. Some coastal areas experienced intense falls of rain resulting in minor localised flooding but also recovery of stock water supply in many dams on farm. The rainfall generated some good pasture responses and provided opportunity for sowing and pasture renovation as well as fodder conservation in many areas.

The autumn rain also proved timely for winter cropping regions in NSW. Initial winter rain continued to support the optimistic outlook for the cropping regions with substantially increased plantings seen compared to the last couple of years.

Dairy farms with irrigation were able to mitigate the effects of the drought to some extent, however many river systems were at critically low flow levels. Many regulated and unregulated systems saw zero irrigation allocation with water supply limited and prioritised for town water supplies.

The regional sections provide more detail on the 2019/20 seasonal conditions. Figure 3 shows the average monthly rainfall pattern in 2019/20 for the participating farms, and the similarities across the state, highlighting how widespread the issue was.

Figure 3 2019/20 monthly rainfall



WHOLE FARM ANALYSIS

2019/20 was again a challenging year for participant farms in NSW due to the ongoing dry conditions experienced for most of the year.

It was the toughest year in the last nine years of the project in terms of feed, with the lowest average level of homegrown feed in the diet experienced and the highest total feed costs. Good milk prices in the North and South were able to compensate for this resulting in the start of a recovery, with profitability increasing on the lows of 2018/19.

There were nine new farms in the project this year (four in the North and five in the South), and there were six who chose not to participate, to increase the sample size to 35 farms (18 in the North and 17 in the South).

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

Average herd size decreased in the northern group to 309 cows, while increasing in the southern group to an average of 463 cows. This was influenced by the change in sample farms.

The average rainfall across the dataset was higher than the previous year, however in terms of actual rainfall on farm, all farms except one received below average annual rainfall.

Milk solids (MS) sold per cow were higher across both regions with the north up 29 kgs to 472 kgs per cow and the south up 9 kg to 555 kgs per cow.

Labour efficiency in kilogram of milk solids produced per full time equivalent person decreased with the North farms and increased with the South farms.

The percentage of home grown feed in the diet decreased from 60% last year to 51% this year, with farms in the North decreasing from 64% to 55% and farms in the South experiencing a decrease from 56% to 47% of the diet being homegrown.

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

Gross farm income

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

Net milk income increased this year due to a 14.7% increase in milk price. The average milk price across all participants was \$8.88/kgMS (65.6 cents/litre) up from \$7.74/kg MS (57 cents/litre) last year. Average milk price in the North this year was \$9.37/kg MS (68.4 c/l) and in the South it was \$8.36/kg MS (62.6 c/l).

Milk income accounted for 90% of gross farm income, with income from livestock trading profit higher at \$0.76/kgMS compared to \$0.66/kg MS in the previous year. Other

Table 1 Farm physical data – state overview

Farm physical parameters	State	North	South
Number of farms in sample	35	18	17
Annual rainfall 19/20 (mm)	822	1038	594
Herd size	384	309	463
Total water use efficiency (t DM/100mm/ha)	0.6	0.5	0.7
Total usable area (ha)	365	314	419
Milking cows per usable hectares	1.2	1.2	1.2
Milk sold (kg MS/cow)	512	472	555
Milk sold (kg MS/ha)	625	579	673
Home grown feed as a % of ME consumed	51	55	47
Labour efficiency (cows/FTE)	76	65	89
Labour efficiency (kg MS/FTE)	39,094	30,408	48,290

income was slightly lower this year at \$0.20/kgMS (1.5 c/l) compared to \$0.28/kg MS (2.0c/l) in the previous year, and included income passed on to dairy farmers from various drought support measures implemented by the major fresh milk retailers and processors as well as Covid-19 business support payments received by some farms.

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 \$3.74/kgMS (27.5 c/L) which is 25% higher than the previous year of \$2.99/kg MS (21.9 c/l). This is a continued effect of the drought, with another year of high cost per tonne of concentrates and fodder and less homegrown feed as a proportion of feed in the diet. Home grown feed costs were lower this year, down to \$1.32/kgMS from \$1.55 per kgMS, again reflecting the lower proportion of homegrown feed in the diet due to seasonal conditions.

Total feed costs, including home grown feed, purchased feed and agistment and feed and water inventory change, were up 6.7% to \$4.79/kgMS compared to \$4.49 /kgMS the previous year, and accounted for 54.4% of total costs (variable plus overhead costs) on average for the state. This was the highest feed cost in the nine years of the project.

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

The gross margin is equal to gross farm income minus total variable costs. While commonly used to compare enterprises that have a similar capital structure like sheep or beef, it can be a useful measure in dairy to analyse changes on farm that do not require capital investment. The state-wide average gross margin was \$4.40/kgMS which was higher than the previous year of \$3.57/kg MS.

Overhead costs

Overhead costs are the costs incurred by the farm business that are not directly related to the size or level of production. These include cash overhead costs such as employed labour and non-cash costs such as imputed owner-operator labour, family labour and depreciation of plant and equipment.

Average total overhead costs this year were higher than last year, at \$3.35/kgMS (24.7 c/l) up from \$3.19/kg MS (23 c/l).

Table 2 shows that in 2019/20 the North had higher average variable costs as well as significantly higher average overhead costs on a per kilogram of milk solids basis compared to the South.

Earnings before interest and tax

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

Average EBIT was higher across the state this year on a milk solids basis, at \$1.05/kg MS (7.9 c/l) compared to \$0.38/kg MS (2.6 c/l) in 2018/19. On dollars per farm basis EBIT was higher this year, at an average of \$269,897 per farm compared to \$53,372 per farm in the previous year.

The state average shows a significant improvement, the two regions both experiencing a healthy increase in EBIT, with the North up from \$0.43 /kg MS to \$0.69/kg MS and the participants in the South having an increase from \$0.31/kg MS to \$1.43/kg MS

This much improved EBIT across the regions, was supported by a 14.7% increase in milk price, outweighing the 6.7% increase in total feed costs due to the continuation of adverse seasonal conditions and the challenges in managing feed supplies. The Emergency Drought Relief packages including the Drought Transport Subsidies (for fodder, water and other production inputs) and Disaster Recovery Grants provided valuable financial support assisting to reduce the impacts of very high commodity prices and those affected by the extreme bushfire conditions.

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 an increase in the average RoTA for participants across the state in 2019/20. The RoTA was 2.7%, up from 0.7% last year.

Figure 5 shows the majority of farms had a RoTA between 0% and 5%. The participant farms ranged from negative 4.9% up to 9%, with 29 of the 35 farms recording a positive RoTA.

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

Farm income and cost category	State		North		South	
	\$ kg/MS	c/l	\$ kg/MS	c/l	\$ kg/MS	c/l
Income						
Milk income (net)	8.88	65.6	9.37	68.4	8.36	62.6
Livestock trading profit	0.76	5.6	0.69	5.0	0.85	6.3
Other farm income	0.20	1.5	0.29	2.2	0.10	0.7
Total income	9.85	72.7	10.35	75.6	9.32	69.6
Variable costs						
Herd cost	0.37	2.7	0.43	3.1	0.31	2.3
Shed cost	0.28	2.0	0.32	2.3	0.24	1.8
Home grown feed cost	1.32	9.8	1.49	11.0	1.13	8.5
Purchased feed and agistment	3.74	27.5	3.90	28.2	3.58	26.8
Feed inventory change	-0.27	-2.0	-0.48	-3.6	-0.05	-0.3
Water inventory change	0.01	0.0	0.00	0.0	0.01	0.1
Total feed costs	4.79	35.3	4.91	35.6	4.67	35.1
Total variable costs	5.44	40.1	5.65	41.0	5.22	39.1
Gross margin	4.40	32.6	4.69	34.6	4.10	30.5
Overhead costs						
Employed labour	1.13	8.2	1.17	8.5	1.08	8.0
Repairs and maintenance	0.46	3.4	0.52	3.8	0.39	3.0
All other overheads	0.40	2.9	0.49	3.5	0.30	2.2
Imputed labour	1.00	7.3	1.42	10.4	0.55	4.2
Depreciation	0.37	2.8	0.40	3.0	0.34	2.6
Total overhead costs	3.35	24.7	4.00	29.1	2.67	19.9
Variable and overhead costs	8.80	64.8	9.65	70.1	7.89	59.1
Earnings before interest and tax	1.05	7.9	0.69	5.5	1.43	10.5

Table 3 Risk indicators – statewide and by region

	State average	North	South
Cost structure (percentage of total costs as variable costs)	62	58	66
Debt service ratio (percentage of income as finance costs)	6	5	7
Debt per cow	\$5,271	\$4,392	\$6,201
Equity percentage (ownership of total assets managed)	73	79	66
Percentage of feed imported (as a percentage of total ME)	49	45	53

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 35 farms was 4.7%, an increase from the negative 0.8% RoE received by participants last year. The range in RoE for the State was negative 9.3% to 64% this year, with 26 of the 35 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.

Risk

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

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

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

The cost structure ratio provides variable costs as a percentage of total costs. A lower ratio implies that overhead costs comprised a greater proportion of total costs which in turn indicates less flexibility in the business. Table 3 shows that across the state for every \$1.00 spent, \$0.62 was used to cover variable costs, the same as last year. However it is worth noting that cost structure varies between regions and farms.

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

This year there was an decrease in average equity levels across the state, with an average of 73% compared to 76% last year. Caution should be exercised when comparing equity between years as the farm sample changes.

Also of note is the increase in reliance on the percentage of imported feed in the diet, up to 49% from 40% the previous year across the state.

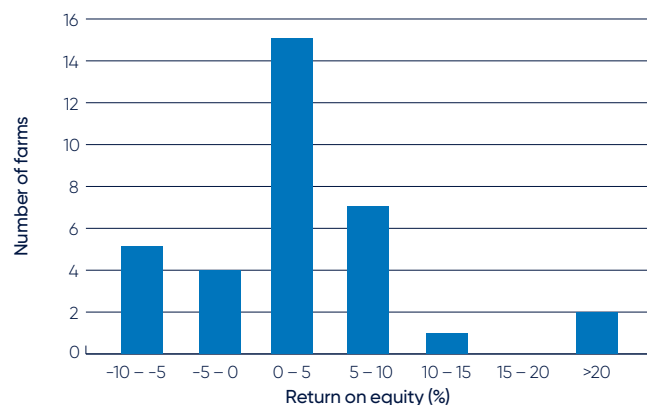
Figure 4 Average earnings before interest and tax



Figure 5 Distribution of farms by return on total assets



Figure 6 Distribution of farms by return on equity



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

PHYSICAL MEASURES

Feed consumption

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

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

On the North farms grazed pasture made up 45% of the diet for cows and concentrates 34%. This represents less pasture and more concentrate than the previous year.

On the South farms pasture made up 32% of the diet, with 35% of the diet coming from concentrates. South farms sourced 31% of the diet from hay and silage, whilst North farms sourced 19% of ME from hay and silage.

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

Appendix Table 3 provides further information on purchased feed.

Figure 8 and Appendix Table 2 provide estimates of the average quantity of home grown feed consumed per milking hectare of sample farms across the state. It accounts only for the consumption of pasture that occurred on the milking area, whether by milking, dry or young stock.

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

Total home grown feed consumed on the milking area (by direct grazing plus conservation) in 2019/20 was down relative to the previous year across both regions.

The North directly grazed 6.0 t DM/ha, and conserved 1.5 t DM/ha, for a total of 7.5 t DM/ha, down by 1.3 t DM/ha. The South consumed an average of 4.8 t DM/ha of direct grazed pasture and conserved 1.0 t DM/ha, for a total of 5.8 t DM/ha, down by 0.6 t DM/ha.

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

Figure 7 Sources of whole farm metabolisable energy

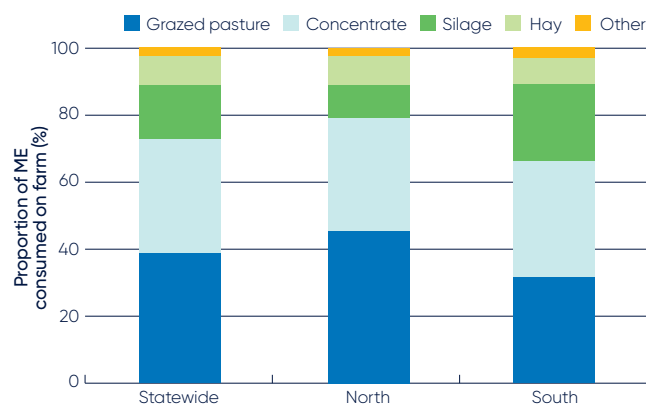
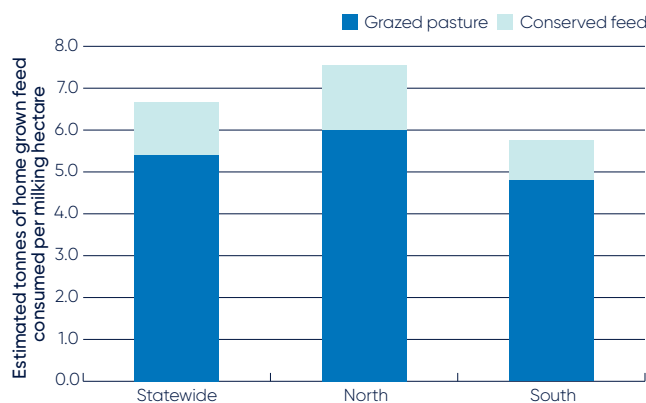


Figure 8 Estimated tonnes of homegrown feed consumed



Fertiliser application

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

Across the state, the total application of nutrients on the milking area was 297.7 kg/ha. This comprised of nitrogen (219 kg/ha), phosphorus (25.9 kg/ha), potassium (33.3 kg/ha) and sulphur 19.5 kg/ha). There was significant difference between the regions, average fertiliser usage on the milking area for the North was: nitrogen at 231.9 kg/ha, phosphorus 25.2 kg/ha, potassium at 50.3 kg/ha, and sulphur at 26.1 kg/ha. For the South it was: nitrogen at 204.3 kg/ha, phosphorus at 26.8 kg/ha, potassium at 13.9 kg/ha and sulphur at 12 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, amount and type of imported feed plus other factors will all influence pasture growth and fertiliser application strategies. These particular factors are not captured as part of this project.

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

Milk production

Figure 10 shows the average monthly distribution of milk sold across both regions of NSW, and reflects the flatter milk supply required by processors for the liquid milk market. While production is very similar for most of the year it can be seen that the North farms in 2019/20 had a drop in production in autumn relative to the South, reflective of the hot and dry conditions for farms in that region.

Calving pattern

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

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

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

Figure 9 Nutrient application per milking hectare

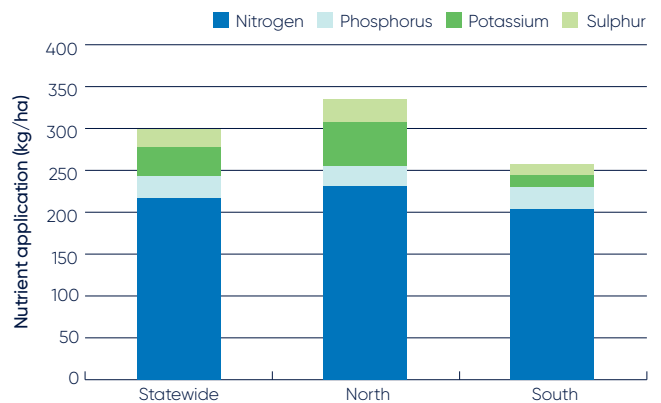


Figure 10 Monthly distribution of milk solids sold

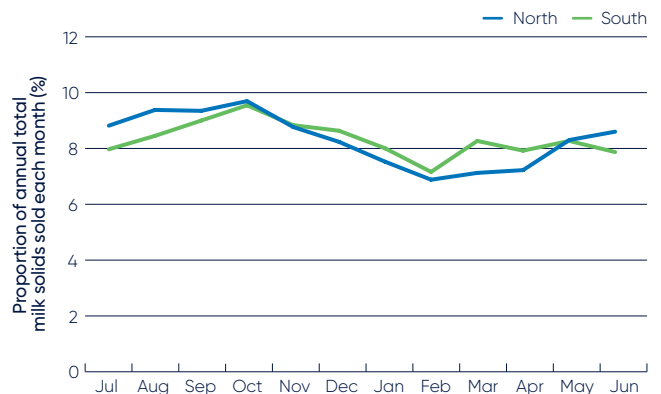
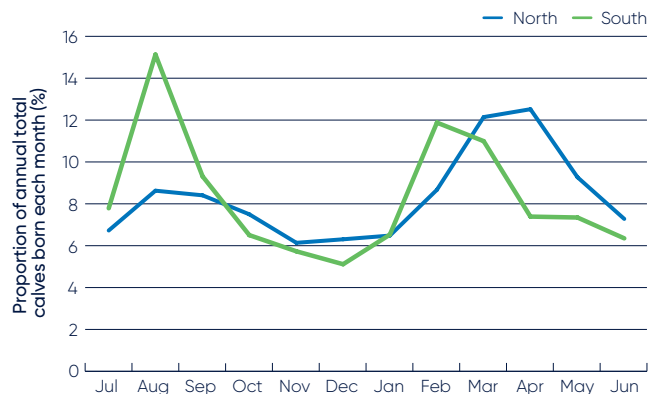


Figure 11 Monthly distribution of calves born



The North



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

2019/20 Seasonal conditions

The first half of 2019/20 saw dry conditions continue throughout northern NSW, with drought or severe drought covering all of the northern half of the state. Summer saw the beginning of some widespread rain during January and much more intense falls during February. Follow up rains began to see an easing of the drought conditions, with pasture growth improving and the confidence to start autumn sowing and some fodder conservation.

All North farms, except one received below their average long term rainfall (Figure 12). Average rainfall for the Northern dataset increased to 1038 mm in 2019/20, up from 838 mm in the previous year.

Whole farm analysis

Participant dairy farmers in the North received an average milk price of \$9.37/kg MS sold this year, up from \$8.07/kg MS in the previous year.

Average herd size for the North farms increased to 309 cows, with milk solids production per cow increasing but milk solids per hectare remaining stable. The average home grown feed as a percentage of ME consumed was much lower at 55% compared to 64% in the previous year. Stocking rate was also slightly lower at 1.2 cows/usable hectare.

Lower stocking rate, high purchased feed prices and more purchased feed, combined with below average rainfall meant that farmers were focussed on making the most of whatever pasture and fodder they could grow.

Grain and fodder prices remained relatively high during 2020 and supply for hay continued to be tight until the final quarter of the year when widespread rainfall began to ease feed supply issues. The NSW government provided drought rebates on transport for fodder and

livestock, and although this was capped, it did help to reduce the landed cost of purchased feed.

Labour efficiency was poorer than the previous year in the North, down to an average of 65 cows/FTE compared to 72 cows/FTE the previous year.

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

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

Milk solids sold

Average milk solids sold per hectare remained similar to last year at 579 kg MS/ha (7,899 litres/ha). Average milk solids sold per cow were up on last year to 472 kgMS/cow (6,483 l/cow) compared to 443 kg MS/cow (6,113 l/cow).

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

Gross farm income

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

The average gross farm income of \$10.35/kg MS included milk income of \$9.37/kg MS (68.4 c/l) plus all other income associated with the dairy business operation of \$0.98/kgMS (7.2 c/l).

This year's average gross farm income was 13% higher than last year's average. The milk price received was up 16%, livestock income was down marginally, and other farm income decreased significantly. Other farm income includes drought support payments raised through campaigns from the major retailers on the sales of liquid milk, fodder sales and government grants received such as the small business stimulus package in response to the coronavirus pandemic.

Figure 14 shows the gross farm income for each farm.

Table 4 Farm physical data – North

Farm physical parameters	North average	Q1 to Q3 range	Top 25% average
Annual rainfall 19/20 (mm)	1,038	774–1,183	738
Herd size	309	172–390	489
Total water use efficiency (t DM/100mm/ha)	0.5	0.3–0.6	0.8
Total usable area (hectares)	314	149–260	443
Milking cows per usable hectares	1.2	0.9–1.6	1.2
Milk sold (kg MS/cow)	472	440–499	572
Milk sold (kg MS/ha)	579	433–748	659
Home grown feed as percentage of ME consumed	55	45–64	58
Labour efficiency (cows/FTE)	65	55–74	92
Labour efficiency (kg MS/FTE)	30,408	27,227–35,068	50,542

Variable costs

Variable costs (shown as the light blue bars in Figure 15) are all costs that vary with the size of production in the enterprise e.g. herd, shed and feed costs (including feed and water inventory changes).

The average total variable cost was \$5.65/kgMS (41.0 c/l) with a range of \$4.91 to \$6.41/kgMS for participant farms in the North. This is 10% higher than in 2018/19 due largely to an increase in purchased feed and agistment costs. Herd costs were up \$0.10/kgMS on 2018/19 to \$0.43/kgMS while shed costs were slightly down on last year at \$0.32/kg MS.

Feed costs were the most significant variable cost items, accounting for 51% of the average total costs in 2019/20. The average feed cost was \$4.91/kg MS, which is 10% higher than last year's cost of \$4.45/kg MS. On average, feed inventory changed by negative \$0.48/kg MS as farmers were able to capitalise on the soil moisture and pasture growth, enabling them to build feed inventory towards the end of the year.

The average cost of home-grown feed was lower than the previous year at \$1.49/kg MS, affected mainly by reduced fodder conservation (hay & silage) costs and a decrease in pasture and cropping costs, with slight reductions in fertiliser, fuel and irrigation costs.

Purchased feed and agistment costs were \$3.90/kg MS, 33% higher than the previous year at \$2.93/kg MS.

The average cost of concentrates in the North this year was \$586/t DM (\$527/t as fed), up from \$580/t DM (\$520/t as fed) last year. The cost of concentrate includes the cost of additives and minerals. North farmers fed an average of 2.1 t DM/head concentrates to the milkers, although this figure includes concentrates fed to young stock on the milking area.

The cost of purchased hay remained at high levels averaging \$465/ t DM (\$395/t as fed), slightly down from the high of \$487/t DM, (\$414 /t as fed) last year.

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

Overhead costs

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

The average overhead costs for 2019/20 at \$4.00/kg MS (29.1 c/l) were higher than the previous year.

The overhead costs this year ranged from \$2.90/kg MS to \$6.78/kg MS (shown as blue bars in Figure 15).

Figure 12 Annual rainfall and long term average rainfall

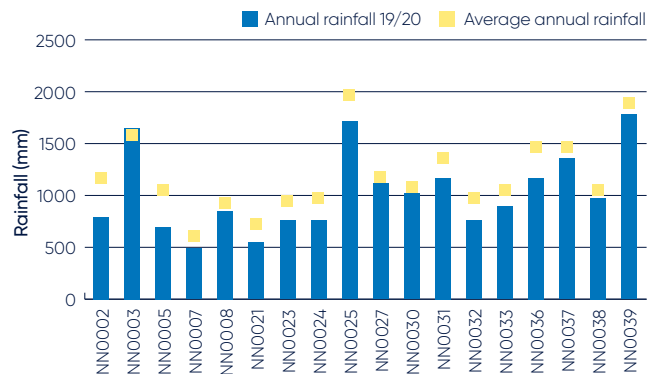


Figure 13 Milk solids sold per hectare and per cow

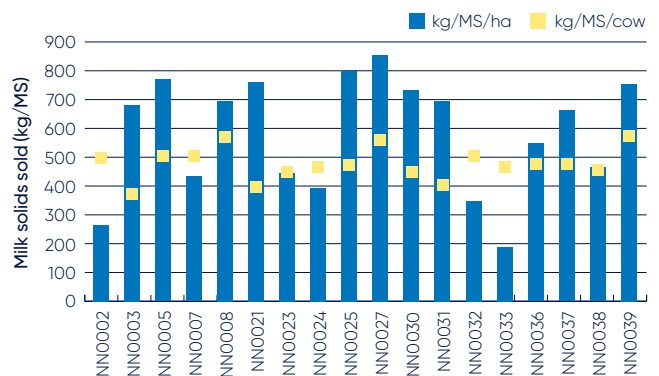


Figure 14 Gross farm income per kilogram of milk solids

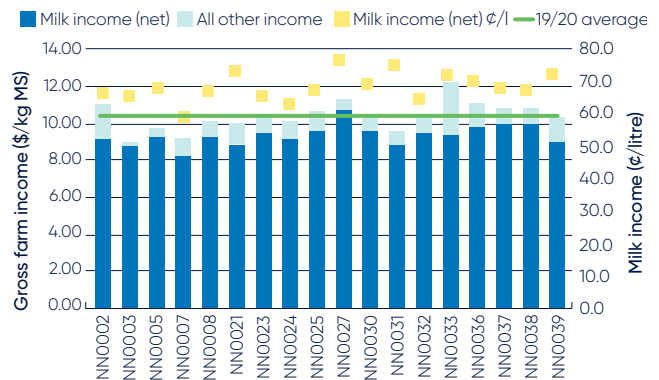


Figure 15 Whole farm variable and overhead costs

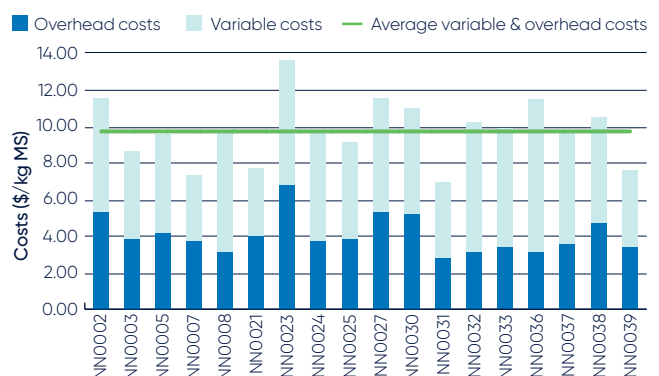


Table 5 Average farm financial performance – northern NSW

Farm income and cost category	North average		Q1 to Q3 range	Top 25% average	
	\$ kg/MS	c/l	\$ kg/MS	\$ kg/MS	c/l
Income					
Milk income (net)	9.37	68.4	9.05– 9.6	8.57	65.0
Livestock trading profit	0.69	5.0	0.36–0.88	0.89	6.6
Other farm income	0.29	2.2	0.02–0.44	0.07	1.2
Total income	10.35	75.6	9.94–10.9	9.62	72.8
Variable costs					
Herd cost	0.43	3.1	0.37–0.49	0.33	2.5
Shed cost	0.32	2.3	0.24–0.37	0.24	1.8
Home grown feed cost	1.49	11.0	1.17–1.72	1.20	9.2
Purchased feed and agistment	3.90	28.2	2.8–4.71	2.78	21.1
Feed inventory change	-0.48	-3.6	-0.49–-0.22	-0.21	-1.6
Water inventory change	0.00	0.0	0–0	0.02	0.1
Total feed costs	4.91	35.6	4.16–5.63	3.80	28.8
Total variable costs	5.65	41.0	4.91–6.41	4.37	33.2
Gross margin	4.69	34.6	4.03–5.32	5.26	39.7
Overhead costs					
Employed labour	1.17	8.5	0.69–1.7	0.90	6.6
Repairs and maintenance	0.52	3.8	0.38–0.7	0.40	3.0
All other overheads	0.49	3.5	0.38–0.65	0.33	2.5
Imputed labour	1.42	10.4	0.78–1.92	0.68	5.4
Depreciation	0.40	3.0	0.3–0.48	0.34	2.6
Total overhead costs	4.00	29.1	3.38–4.14	2.65	20.1
Variable and overhead costs	9.65	70.1	8.76–10.44	7.02	53.2
Earnings before interest and tax	0.69	5.5	0.1–1.5	2.60	19.6

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	8.31	60.4	7.69–9.27	6.18	46.7
Cost of production (excluding inventory changes)	10.13	73.7	9.54–11.09	7.21	54.7
Inventory change					
+/- feed and water inventory changes	-0.48	-3.6	-0.49– -0.22	-0.19	-1.4
+/- livestock inventory changes minus purchases	0.17	1.2	-0.21–0.52	-0.07	-0.6
Cost of production (including inventory changes)	9.82	71.3	9.03–10.66	6.95	52.6

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 64.7% of total overhead costs. This year total labour costs were higher than 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 this year to \$9.82/kg MS (71.3 c/l) from \$8.67/kg MS (63 c/l) in 2018/19.

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

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

Earnings before interest and tax

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

The average EBIT across North farms this year increased to \$0.69/kg MS (5.5 c/l) compared to \$0.43/kg MS (3.1 c/l) last year. This was mainly due to the higher gross farm income offsetting the increase in costs.

Figure 16 shows a wide range in EBIT across the North farms, from negative \$3.24/kg MS to \$2.77/kg MS sold. Fourteen of the North farms recorded a positive EBIT, with four farms with an EBIT less than zero.

The top 25% farms in the state recorded an average EBIT of \$2.60/kg MS (19.6 c/l), highlighting the strength of these well run businesses. Whilst their milk income was lower than the average, they managed to keep costs lower and so generate a higher profit margin.

Return on total assets and equity

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

The average return on total assets for participant farms this year was 1.7%, up from 1.1% the previous year. The range across the group was -4.9% to 8.2%.

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 0.9%, an increase from 0.2% recorded last year. There was a wide range of return on equity reflecting the various capital structures of businesses in Northern NSW. Six 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 EBIT per kilogram of milk solids

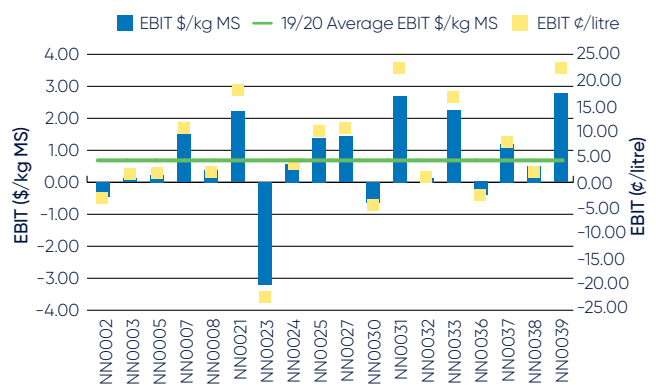


Figure 17 Return on total assets

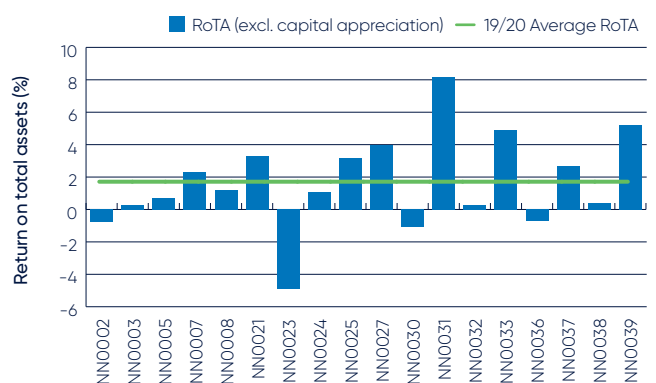
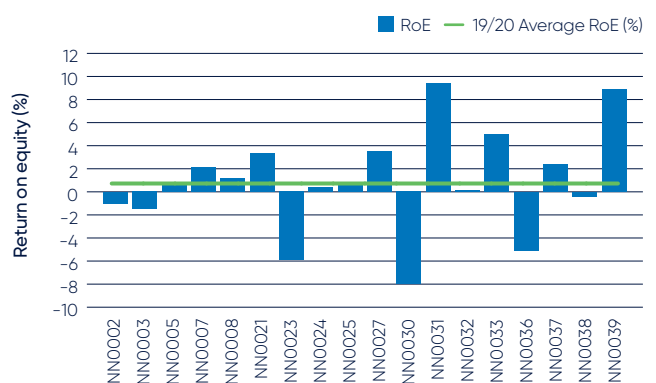


Figure 18 Return on equity



FEED CONSUMPTION AND FERTILISER USE

Farms in the North show a wide range of feeding systems, and directly grazed pasture is normally 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 lower than the previous year due to ongoing 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 9 of the 18 farms this year, with the average being 45%, and the range was between 20% and 72%. The portion of the ME consumed derived from concentrates was slightly higher this year at an average of 34%. All participant farms fed silage as part of their ME consumed with the range between 2% and 28%, and an average of 10% of the diet, similar to last year. Hay accounted for 9% of ME consumed on average, higher than the year before.

With the effect of cumulative dry seasons, on average less than 50% of ME consumed came from grazed pasture. This loss was made up for with increases in ME from concentrates and hay.

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 homegrown feed for the North on average was 7.5 t DM/ha, which was lower than the previous year of 8.8 t DM/ha. This included an average of 6.0 t DM/ha directly grazed and 1.5 t DM/ha conserved. This year six farms conserved no feed on the milking area.

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

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

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

Fertiliser application

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

The average fertiliser application was 333.5 kgs/milking hectare. Farms in the North applied slightly lower levels of nitrogen, phosphorus, potassium and sulphur per hectare in 2019/20 compared to the previous year (Figure 21).

Average nitrogen use was 219 kg/ha, phosphorus 24 kg/ha, potassium 48 kg/ha and sulphur 25 kg/ha this year.

These usage figures show that in combination with the dry conditions (low rainfall, little soil moisture) and less pasture utilised, there was generally less opportunity to apply fertiliser to produce extra dry matter.

Figure 19 Sources of whole farm metabolisable energy

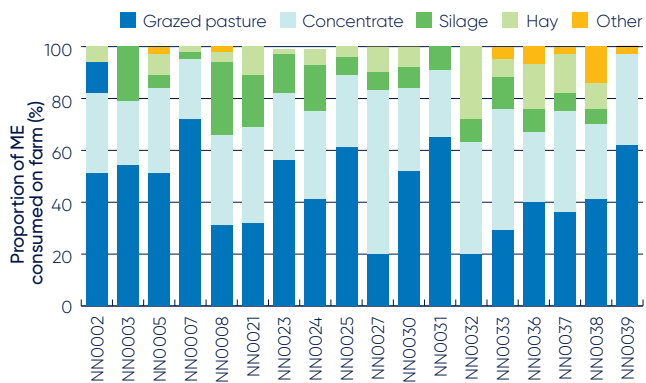


Figure 20 Estimated tonnes of home grown feed consumed (milking ha)

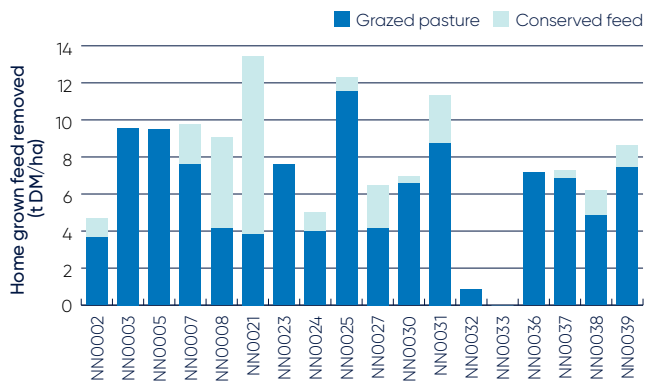
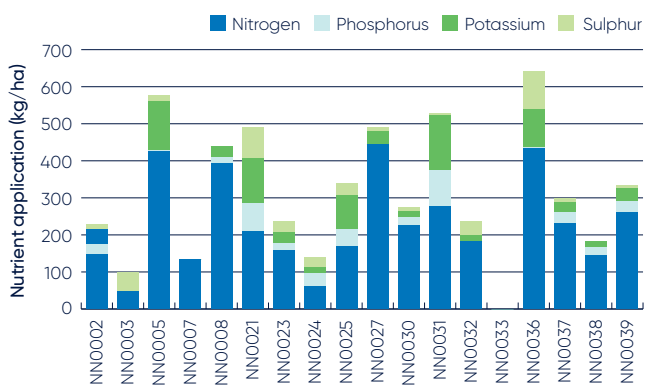


Figure 21 Nutrient application per milking area



The South



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

Seasonal conditions

2019/20 saw southern NSW continue to experience minimal rainfall. Long term soil moisture deficits persisted restricting pasture growth. Autumn brought some intense falls in many areas and some follow up. However the Far South Coast, experiencing some good falls in February experienced a much slower recovery. Towards the end of the year most regions were in a trend of easing drought conditions. Cropping regions such as the Riverina benefited from some early rainfall events in the year however by the middle of summer drought conditions had intensified. The autumn rainfall was beneficial to this region in the lead up to sowing of winter crops.

Average annual rainfall for the South farms was 594mm compared to 556mm in the previous year.

Irrigators on the regulated inland rivers have generally faced zero allocations for general security water in 2020, so have had to rely on carry over water, groundwater or purchasing temporary water, where available and if affordable.

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

Whole farm analysis

Participant dairy farmers in the South received an average milk price of \$8.36/kg MS for milk sold this year, up from \$7.37/kg MS in the previous year.

Average herd size for the South farms was 463 cows, and milk solids production per cow was higher this year at 555 kg MS/cow. The average home grown feed as a

percentage of ME consumed was much lower at 47%, compared to 56% in the previous year. Stocking rate was the same, at 1.2 cows/usable hectare.

Limited rainfall and irrigation meant the amount of directly grazed pasture was lower than the previous year, down 0.5 t DM/ha however the amount conserved and consumed was similar. This meant more reliance on high cost purchased feeds.

Grain and fodder prices continued to remain high during 2020 and in tight supply. The NSW government provided drought rebates on transport for fodder and livestock, which although capped per farm helped to reduce the landed cost of purchased feed.

Labour efficiency was higher than the previous year.

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

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

Figure 22 Annual rainfall and long term average rainfall

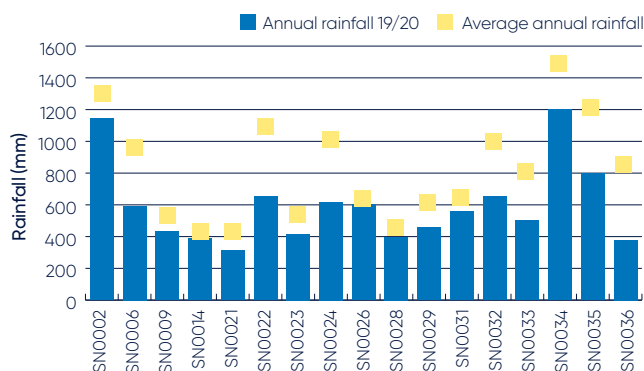


Table 7 Farm physical data – South

Farm physical parameters	South average	Q1 to Q3 range	Top 25% average
Annual rainfall 19/20 (mm)	594	416–653	738
Herd size	463	315–441	489
Total water use efficiency (t DM/100mm/ha)	0.7	0.5–0.8	0.8
Total usable area (hectares)	419	231–589	443
Milking cows per usable hectares	1.2	1.0–1.4	1.2
Milk sold (kg MS/cow)	555	475–577	572
Milk sold (kg MS/ha)	673	453–813	659
Home grown feed as percentage of ME consumed	47	40–60	58
Labour efficiency (cows/FTE)	89	70–99	92
Labour efficiency (kg MS/FTE)	48,290	39,419–56,523	50,542

Milk solids sold

Average milk solids sold per hectare increased this year to 673 kg MS/ha (9,062 litres/ha). The range this year was between 258 kg MS/ha and 883 kg MS/ha (4,906 litres/ha to 13,176 litres/ha).

The average milk solids sold per cow were higher than last year, at 555 kg MS/cow (7,449 litres/cow).

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

Gross farm income

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

The average gross farm income for South farms was 9.32/kg MS (69.6 c/l), which included milk income of \$8.36/kg MS (62.6 c/l) plus all other income associated with the dairy business operation of 0.95/kg MS (8.0 c/l).

This year's average gross farm income was 14.5% higher than last year's average. The milk price received was up 13%, livestock income was higher, and other farm income increased from last year. Other farm income includes drought support payments raised through campaigns from the major retailers on the sales of liquid milk, fodder sales and grants received such as the small business stimulus package.

Figure 24 shows the gross farm income for each farm.

Variable costs

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

The average variable cost was \$5.22/kg MS (39.1 c/l) with a range of \$3.39/kg MS to \$7.86/kg MS for participant farms in the South. This is 2% higher than in 2018/19 due to an increase in feed costs. Herd and shed costs were similar to last year at \$0.31/kg MS and \$0.24/kg MS, respectively.

Feed costs were the most significant variable cost, accounting for 59% of total costs. Average feed costs including feed inventory change was \$4.67/kg MS (35.1 c/l), which is 3% higher than last year's cost of \$4.54/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 much to carry over at the end of the year. However, there were some farms who had stored feed on hand and used it during the year, which represented an increase in feed costs.

The average cost of home-grown feed decreased to \$1.13/kg MS, from \$1.48 /kgMS in the previous year. Purchased feed and agistment cost was \$3.58, up from \$3.06/kg MS in the previous year, reflecting the ongoing high prices for grain and hay and the quantities being purchased in a dry season.

The average cost of concentrates this year was \$522/t DM (\$472 as fed), down from \$552/t DM last year. The cost of concentrate includes the cost of additives and minerals. South farmers fed 2.2 t DM/hd of concentrates to the milkers, up from 2.1 t DM/head the previous year, although this figure includes concentrates fed to young stock on the milking area.

The average cost of purchased hay this year was \$357/t DM (\$303/t as fed).

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

Figure 23 Milk solids sold per hectare and per cow

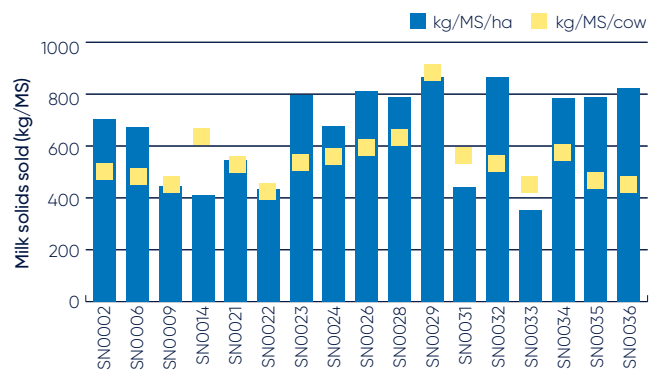


Figure 24 Gross farm income per kilogram of milk solids

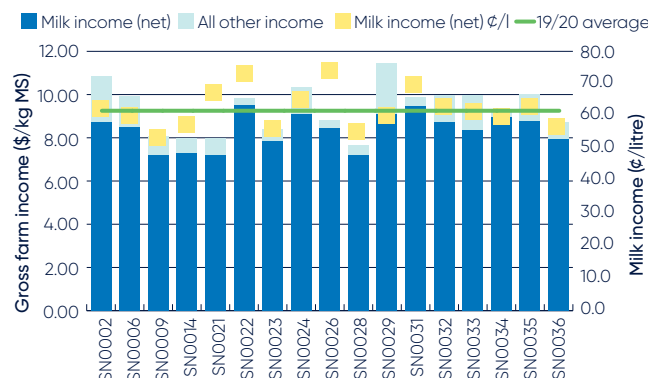
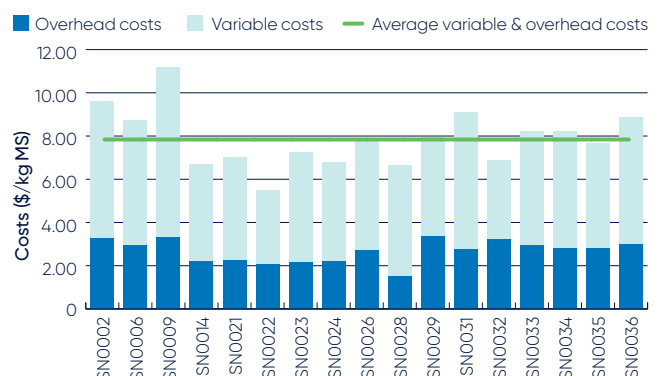


Figure 25 Whole farm variable and overhead costs



Overhead costs

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

The average overhead costs for 2019/20 were \$2.67/kg MS (19.9 c/l), slightly down on the previous year. The overhead costs this year ranged from \$1.50 /kg MS to \$3.37/kg MS (shown as blue bars in Figure 25).

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

The main overhead cost category is labour, both employed and imputed, which at \$1.63 /kgMS account for 61% of total overheads.

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

Cost of production

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

Table 9 shows that the average cost of production with inventory changes this year was \$7.95/kg MS (59.6 c/l), similar to last year at \$7.97/kg MS (59.7 c/l)

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

Table 8 Average farm financial performance – southern NSW

Farm income and cost category	South average		Q1 to Q3 range	Top 25% average	
	\$ kg/MS	c/l		\$ kg/MS	\$ kg/MS
Income					
Milk income (net)	8.36	62.6	7.83–8.94	8.57	65.0
Livestock trading profit	0.85	6.3	0.48–1.18	0.89	6.6
Other farm income	0.10	0.7	0–0.13	0.07	1.2
Total income	9.32	69.6	8.4–9.98	9.62	72.8
Variable costs					
Herd cost	0.31	2.3	0.22–0.35	0.33	2.5
Shed cost	0.24	1.8	0.16–0.29	0.24	1.8
Home grown feed cost	1.13	8.5	0.9–1.33	1.20	9.2
Purchased feed and agistment	3.58	26.8	2.79–4.09	2.78	21.1
Feed inventory change	-0.05	-0.3	-0.19–0.07	-0.21	-1.6
Water inventory change	0.01	0.1	0–0	0.02	0.1
Total feed costs	4.67	35.1	4–5.09	3.80	28.8
Total variable costs	5.22	39.1	4.56–5.68	4.37	33.2
Gross margin	4.10	30.5	3.39–5.47	5.26	39.7
Overhead costs					
Employed labour	1.08	8.0	0.82–1.41	0.90	6.6
Repairs and maintenance	0.39	3.0	0.28–0.42	0.40	3.0
All other overheads	0.30	2.2	0.26–0.35	0.33	2.5
Imputed labour	0.55	4.2	0.32–0.73	0.68	5.4
Depreciation	0.34	2.6	0.26–0.37	0.34	2.6
Total overhead costs	2.67	19.9	2.19–3	2.65	20.1
Variable and overhead costs	7.89	59.1	6.88–8.74	7.02	53.2
Earnings before interest and tax	1.43	10.5	0.98–2.3	2.60	19.6

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 increased by 361% to \$1.43 /kg MS (10.5 c/l), compared to \$0.31/kg MS (2.0 c/l) last year. The higher income received enabled a stronger profit margin.

Figure 26 shows a wide range in EBIT across the South farms, from negative \$3.17/kg MS to \$4.38/kg MS. Fifteen of the South farms recorded a positive EBIT, with two farms recording a negative result.

The top 25% farms in the state recorded an average EBIT of \$2.60/kg MS (19.6 c/l), highlighting the strength of these well run businesses. This was achieved through a slightly higher milk income for the group compared to last year (2.5%) but much lower total costs on average (11% lower).

Return on total assets and equity

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

The return on total assets was higher for participant farms this year, with an average of 3.8% up from 0.3% the previous year. Two farms had a negative or zero return on assets. The range was negative 5% to 9%.

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

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

The average was higher this year at 8.8% compared with negative 2.1% last year. There was a wide range of return on equity reflecting the various capital structures of businesses in Southern NSW. Three farms recorded a negative RoE.

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

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

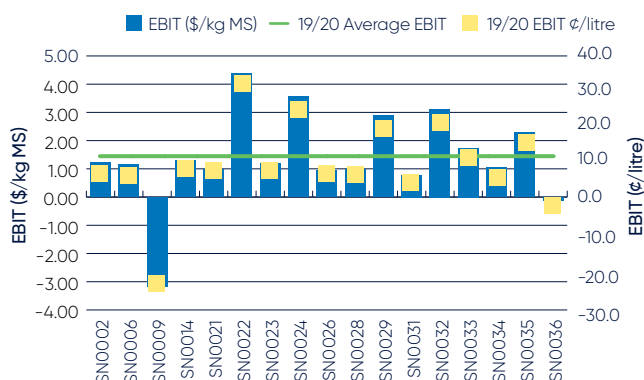


Figure 27 Return on total assets

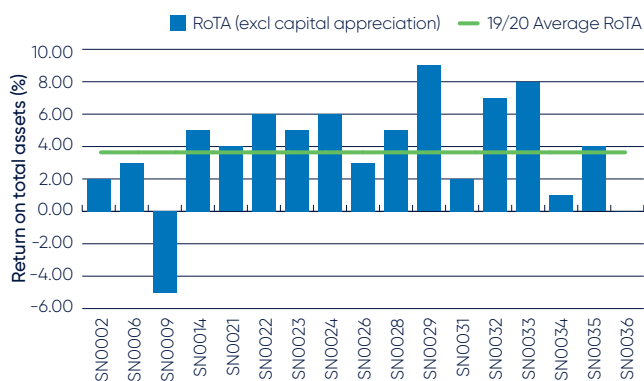


Figure 28 Return on equity

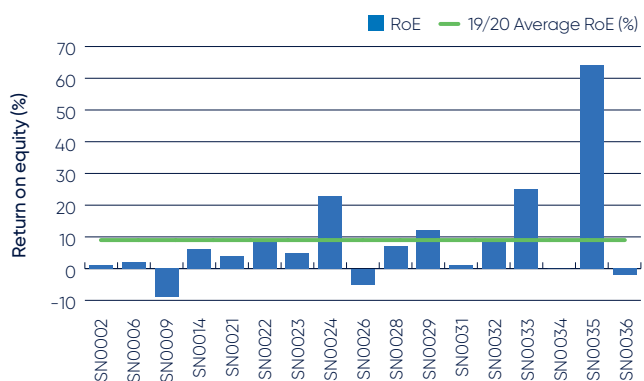


Table 9 Cost of production

Farm costs	South average		Q1 to Q3 range	State top 25% average	
	\$ kg/MS	c/l	\$ kg/MS	\$ kg/MS	c/l
Cash cost of production	7.03	52.6	6.19–7.89	6.18	46.7
Cost of production (excluding inventory changes)	7.93	59.3	6.76–8.49	7.21	54.7
Inventory change					
+/- feed and water inventory changes	-0.04	-0.2	-0.13–0.08	-0.19	-1.4
+/- livestock inventory changes minus purchases	0.06	0.5	-0.15–0.34	-0.07	-0.6
Cost of production including inventory change	7.95	59.6	6.66–9.01	6.95	52.6

FEED CONSUMPTION AND FERTILISER USE

Southern participant farms show a wide range of feeding systems. In 2019/20 directly grazed pasture was not the main source of metabolisable energy on the majority of the farms in this region, due to the challenging seasonal conditions and the changing nature of feeding systems on these farms.

Feed consumption

The relative contribution of each feed type to the metabolisable energy (ME) consumption on each farm is shown in Figure 29. The broad range of different sources of ME used on individual farms is evident. Grazed pasture supplied 50% or more of ME consumed on only 2 of the 17 farms this year, with the average being 32%, which is lower than the 36% last year. The range was between 0% and 56%. The portion of the ME consumed derived from concentrates was similar to the previous year at 35%. All participant farms fed hay and silage. Hay and silage accounted for 31% of ME consumed on average. This is an increase on the previous year by 4%, with the extra coming from silage.

As per last year, the combination of less grazed pasture and more silage and hay being fed reflects continued poor 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 homegrown feed for the South on average was 5.8 t DM/ha, which was lower than the previous year. This year the amount of directly grazed pasture was lower than the previous year, and the amount conserved per hectare was similar to the previous year. This included an average of 4.8 t DM/ha directly grazed and 1.0 t DM/ha conserved.

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

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

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

Fertiliser application

The proportion of nutrients in fertiliser applied per hectare on South farms in 2019/20 are shown in Figure 31.

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

All farms applied some fertiliser to their crops and pasture, though not all on the milking area. The average fertiliser application was 257kgs /milking hectare, up from 207 kgs/ha last year.

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

Application rates in 2019/20 were: nitrogen 180 kg/ha, phosphorus 24 kg/ha, potassium 12 kg/ha and sulphur 11 kg/ha.

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

Figure 29 Sources of whole farm metabolisable energy

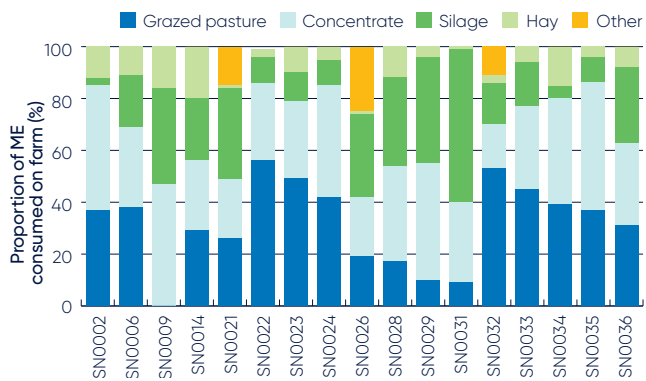


Figure 30 Estimated tonnes of home grown feed consumed per milking area hectare

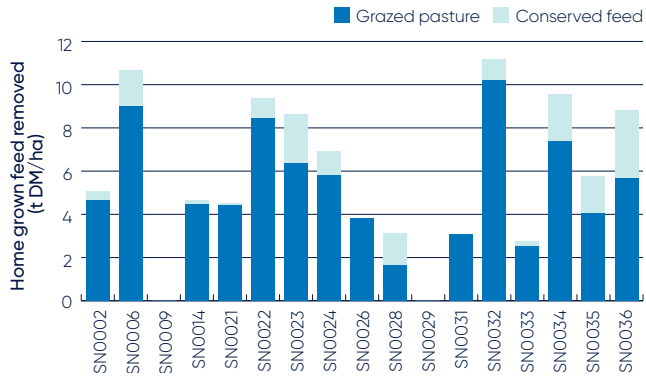
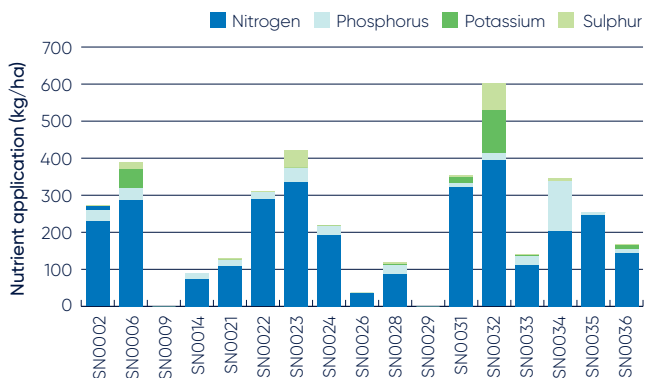


Figure 31 Nutrient application per milking hectare



Business confidence survey



Responses to this business confidence survey were made at the time of data collection in July and August 2020 with regard to the 2020/21 financial year and the next five years.

Expectations for business returns

Following higher average profits in the 2019/20 year and with a general easing of drought conditions towards the end of the financial year, farmers' expectations about business profit for the 2020/21 season were very positive. 94% of farmers in the North, and 88% in the South expected an improvement in business profit, whilst 6% in the north and south thought profit would be stable.

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

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

100% of the participants in the North had an expectation of an improvement or no change in farm business returns in 2020/21. In the South, 94% of participants expected an improvement or no change to business returns. Only 3% of farmers in the south expected business profit to deteriorate.

Price and production expectations – milk

There are mixed expectations about milk price, however the majority of farmers expect prices to remain stable in both regions.

As shown in Figure 33, intentions about increasing milk production were similar across the regions. For the North farms, 56% of respondents intend to increase milk production, and 44% expected to remain the same. None expect milk production to decline.

In the South nearly 59% intend to increase production, whilst 41% expect to remain the same. None expect milk production to decline.

Production expectations – fodder

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

With the favourable autumn and early winter conditions at the end of the year there is consistent optimism across the state with 94% of farmers in the North and South expecting fodder production to increase in 2020-21 (Figure 34). Only 6% expect a reduction in fodder production in the North and 6% expect it to remain stable in the South in the coming year.

Figure 32 Expected farm business profit in 2020/21

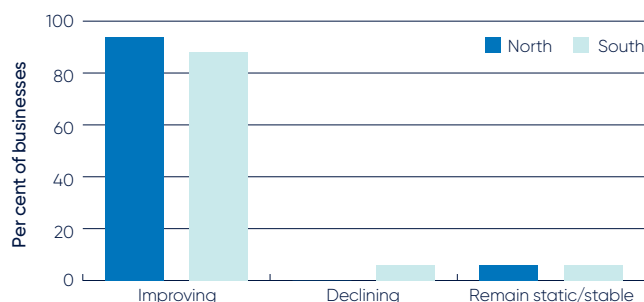


Figure 33 Producer expectations of prices and production of milk in 2020/21

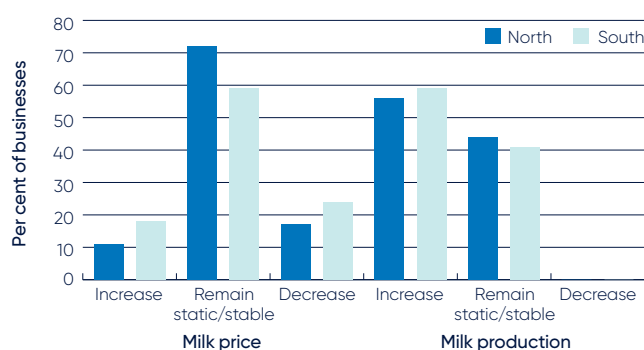
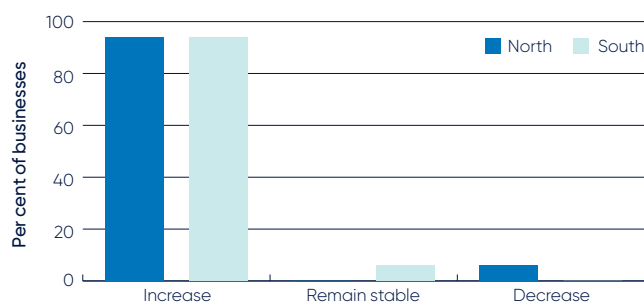


Figure 34 Producer expectations for production of fodder in 2020/21



Cost expectations

Figure 35 shows the expectations of costs for the dairy industry from participant farms in the project. The question refers to total costs to the business for each category, not the unit price for inputs, such as of grain or fertiliser. There was a significant response to expectations of purchased feed costs, which are the largest cost category on most farms. 94% of respondents expected these costs to decrease, with 6% expecting no change. No-one expects an increase.

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

Major issues in the dairy industry – the next 12 months

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

Figure 36 shows that 40% of the respondents identified seasonal conditions as the most important issue they are facing in the short term (next 12 months). The easing of drought conditions has provided many with a sense of relief, bringing optimism for the ability to grow more homegrown feed and conserve fodder. However the cumulative effect of several extremely dry years in many regions and the uncertainty around water security and availability with the volatility in climate remains a major concern across the whole state. This is both a short and long term issue that has a major impact on dairy farm performance and profitability. Labour and milk price are the next most important issues, followed by input prices. Labour has ranked much more highly than last year with 17% of farmers giving it high priority, compared to less than 5% last year. Milk price is less of a priority this time compared to the previous year due to the good prices currently being received.

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

Some farmer comments were:

- Hope to refine the labour situation with the team and run a bit more efficiently.
- Government regulations changing and at the front of our minds are changes to water policy and Covid-19.
- Heifer rearing is our main issue and we would like to be able to afford some runoff land instead of leasing.
- Building new rotary dairy using 100% TMR for milkers.
- Positive about the next 12 months due to good milk price, feed prices are lower and season looks good.

Major issues in the dairy industry – the next 5 years

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

Climate/seasonal conditions are viewed as the most important issue over the next five years among the respondents as per the response for the short term. Following this was milk price, input costs and water along with labour.

Additional comments tended to focus on anticipated on-farm developments including compost barns, automatic milking systems and expansion of effluent reuse on farm with irrigation development.

Figure 35 Producer expectations of costs for the dairy industry in 2019/20

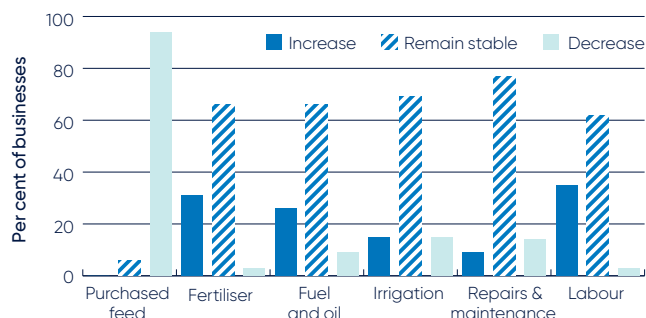


Figure 36 Major issues for individual businesses – 12 month outlook

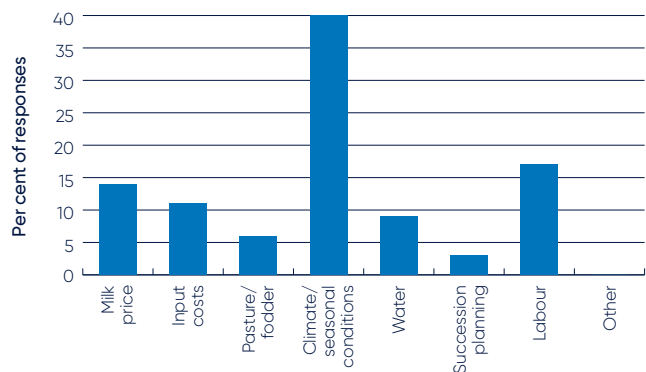
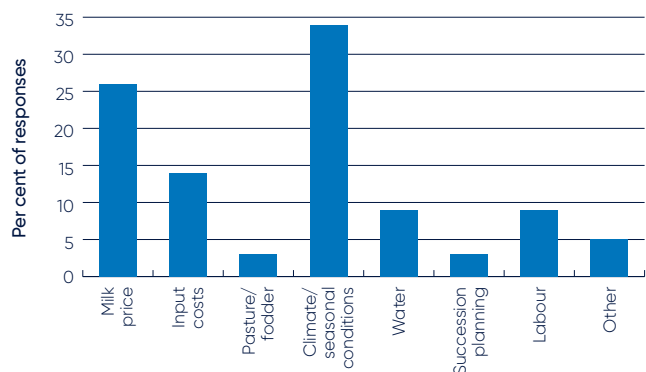


Figure 37 Major issues for individual businesses – 5 year outlook



Greenhouse gas emissions



The average emissions from participating farms was 15.6 tonnes of carbon dioxide equivalents per tonne of milk solids (t CO₂-e/t MS) in 2019/20. The most significant source of on-farm emissions were methane from ruminant digestion, contributing 62% of total farm emissions. The next biggest contributor was from pre-farm emissions sources (carbon dioxide from purchased feed and fertiliser), contributing 16%.

Carbon dioxide equivalents (CO₂-e) are used to standardise the greenhouse potentials from different gases. The Global Warming Potential (GWP) is the index used to convert relevant non-carbon dioxide gases to a carbon dioxide equivalent. This is calculated by multiplying the quantity of each gas by its GWP. All of the data in this section is in CO₂-e tonnes and expressed per tonne of milk solids produced (CO₂-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; CO₂; methane; CH₄; nitrous oxide; N₂O). This year the greenhouse emission was calculated through DairyBase using the Australian Dairy Carbon Calculator.

The distribution of different emissions for 2019/20 is shown in Figure 38. Greenhouse gas emissions per tonne of milk solids produced ranged from 11.4 t CO₂-e/t MS to 20.9 t CO₂-e/t MS with an average emission level of 15.6 t CO₂-e/t MS.

Methane was identified as the main greenhouse gas emitted from dairy farms, accounting for 9.7 t CO₂-e/t MS, 62% of all greenhouse emissions. Methane produced from ruminant digestion (enteric CH₄) was the major source of emissions from all farms in this report, with an average of 53% of total emissions. Methane from effluent ponds accounted for 9% of total emissions on average across the state in 2019/20.

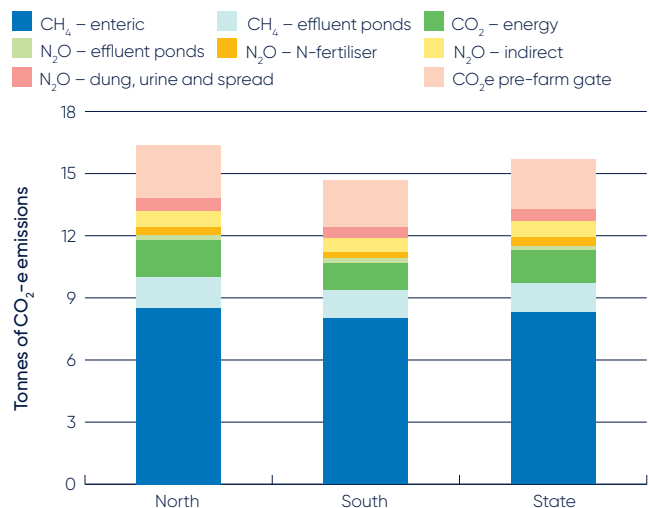
The second main greenhouse gas emission was CO₂ being produced primarily from fossil fuel consumption as either electricity or petrochemicals. Carbon dioxide accounted for 26% of total emissions (3.0 t CO₂-e/t MS) in 2019/20. The estimation of greenhouse gas emissions includes a pre-farm gate emission 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 16% of the emissions and 10% from on-farm energy sources. Output levels were highly dependent on the source of electricity used with an increasing number of farms installing solar panels to generate electricity and offset the rising cost of electricity.

The third main greenhouse gas emission was nitrous oxide N₂O, accounting for 12% of total emissions or 2.0 t CO₂-e/t MS. This gas is produced from wastes (dung and urine); applied fertiliser and effluent ponds.

Nitrous oxide emissions from fertiliser accounted for 2.3% of total emissions, effluent ponds accounted for 1.3% and excreta accounted for 3.7%. Nitrous oxide from indirect emissions was 4.9%. Nitrous oxide emissions are highest in warm, waterlogged soils with readily available nitrogen. Over application of nitrogen, high stocking intensity and flood irrigation are all potential causes of increased nitrogen loss as N₂O. Strategic fertiliser management practices can reduce N₂O emissions and improve nitrogen efficiency.

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

Figure 38 2019/20 Greenhouse gas emissions per tonne of milk solids produced (CO₂ equivalent)



Greenhouse gas emissions – North

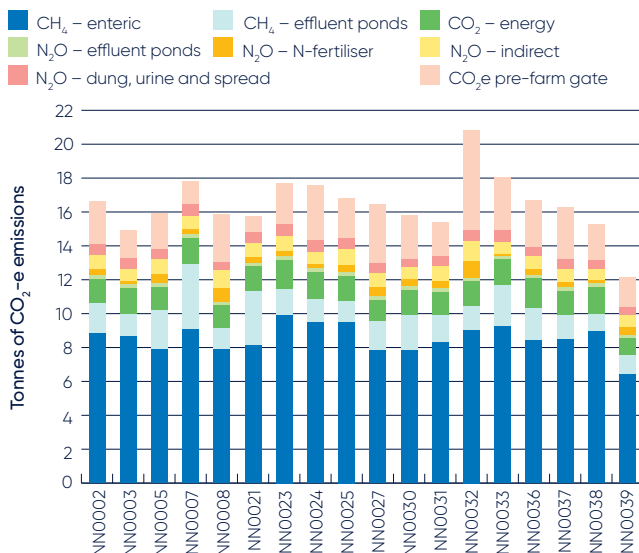
Participant farms in the North emitted an average of 16.4 t CO₂-e/t MS in 2019/20, mainly from methane produced by ruminant digestion (61%) and carbon dioxide from purchased feed and fertiliser (16%).

Methane was the main greenhouse gas emitted from participant farms in the North, accounting for 10 t CO₂-e/t MS, 61% of the average total greenhouse emissions (Figure 39). Methane produced from ruminant digestion contributed 8.5 t CO₂-e/t MS to regional average emissions while methane from effluent ponds accounted for 1.5 t CO₂-e/t MS.

Carbon dioxide accounted for 4.4 t CO₂-e/t MS, 26.8% of emissions in 2019/20, which comprised 1.8 t CO₂-e/t MS from fossil fuels and 2.6 t CO₂-e/t MS from pre-farm gate sources.

Nitrous oxide emissions contributed 2.0 t CO₂-e/t MS, 12% of all emissions. Direct emissions from applied nitrogen fertiliser, effluent management systems and animal wastes accounted for 1.2 t CO₂-e/t MS. The balance of 0.8 t CO₂-e/t MS came from ammonia and nitrate loss in soils as indirect sources.

Figure 39 2019/20 Greenhouse gas emissions per tonne of milk solids produced – North



Greenhouse gas emissions – South

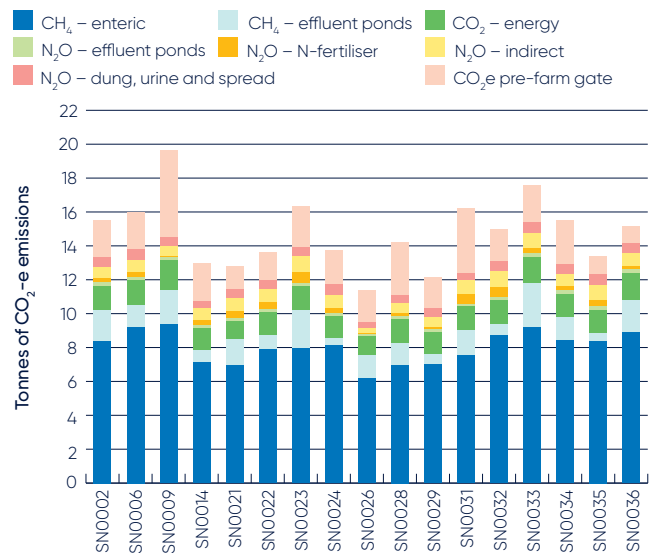
Participant farms in the South emitted an average of 14.8 t CO₂-e/t MS in 2019/20. The two main sources of the emissions were methane gas from ruminant digestion (64% of the total emissions) and carbon dioxide from purchased feed and fertiliser (15%).

Methane was the main greenhouse gas emitted from participant farms in the South accounting for 9.4 t CO₂-e/t MS, 64% of the average total greenhouse emissions. Methane produced from ruminant digestion was 8.0 t CO₂-e/t MS and CH₄ from effluent ponds accounted for 1.4 t CO₂-e/t MS (Figure 40).

Carbon dioxide emissions were 3.6 t CO₂-e/t MS, 24.3% of emissions in 2019/20, comprised of 1.2 t CO₂-e/t MS from fossil fuels and 2.3 t CO₂-e/t MS from pre-farm gate sources.

Nitrous oxide emissions contributed 1.7 t CO₂-e/t MS, 12% of all emissions. Direct emissions from applied nitrogen fertiliser, effluent management systems and animal wastes accounted for 1.0 t CO₂-e/t MS. The balance of 0.7 t CO₂-e/t MS came from ammonia and nitrate loss in soils as indirect sources.

Figure 40 2019/20 Greenhouse gas emissions per tonne of milk solids produced – South





Historical
analysis

The 2019/20 year was an interesting year for the NSW dairy industry as the drought continued and intensified with water supply becoming critical in most areas of the State. This kept input prices high and increased the cost of production.

Whilst input prices remained high and the percentage of homegrown feed utilised decreased resulting in more purchased feed being used, the milk price increase was good enough to turn around the average performance across NSW. Average state-wide farm profits in 2019/20 were the equal third highest in the nine year history of the project for EBIT and the fourth highest for return on total assets. Both regions saw an improvement in profit, markedly so in the South.

The graphs below show the trends in profits and returns over the past nine years of the project.

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

The North

Farm profits improved in the North this year. The nine-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 RoTA was 1.7% .

The nine-year average return on equity was 0%, with a range of negative 1.7% to 2.2%. This year the North RoE was 0.9%.

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 2019/20 the average EBIT per farm was \$141,281, up from \$87,175 last year. The nine-year average (in real terms – including inflation) for EBIT for North farms was \$103,290 per farm.

Regarding net farm income, for three out of the nine years the average was negative, meaning many farms made a loss after covering the cost of debt servicing and leasing. This year the nine year average NFI improved to \$10,957 per farm.

The 2019/20 year saw milk price improve by 16% in the North, while other farm income decreased. So while production costs rose, the higher income meant the profit margin was higher. Feed costs were the main contributor to the rise in costs, reaching \$4.91 /kg MS – the highest in the life of the project.

Figure 41 Historical whole farm performance – North

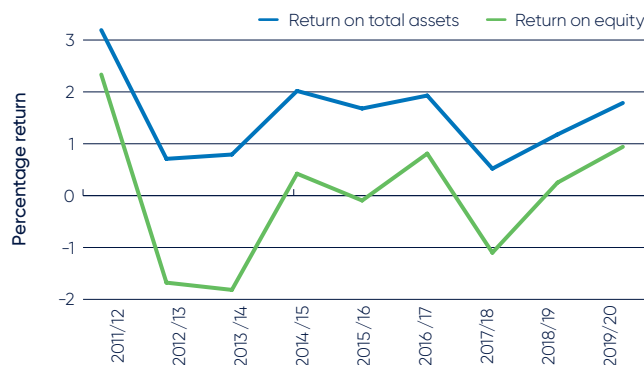
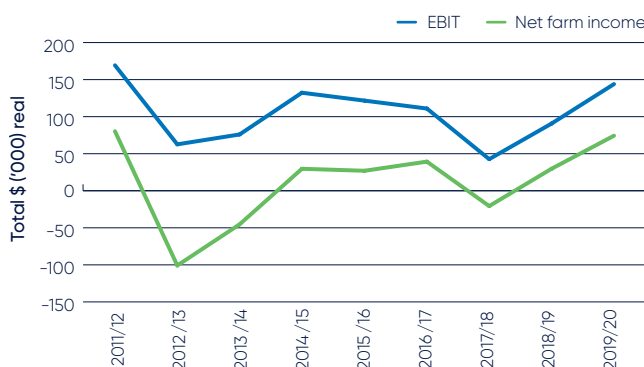


Figure 42 Historical farm profitability (real \$) – North



The South

The graphs below show the trends in profits and returns over the past nine years. 2019/20 saw the fifth highest profit levels for the South region over the life of the project. The nine-year average for return on total assets (Figure 43) for the South is 3.5%, with a range of 0.3 to 5.5%; and for return on equity the average was 3.3%, with a range of -2.1 to 8.8%.

Figure 44 shows the trend in earnings before interest and tax (EBIT) and in net farm income. 2019/20 was the third highest profit year over the course of the project, with an average EBIT per farm of \$406,083, up from \$15,061 in the previous year. The nine-year average EBIT for South farms (in real terms – including inflation) was \$283,198.

As experienced in the North, 2019/20 saw milk price improve by 13%. There was an increase in livestock trading profit while other farm income was slightly down. Although feed costs were higher, profits improved dramatically. Feed costs reached \$4.67 /kg MS, the highest in the life of the project. In contrast, overhead costs decreased slightly on last year.

Average return on total assets for the South farms in 2019/20 was 3.8%, while return on equity averaged 8.8%.

This year has marked the first upward trend in profits and returns in the South since 2014/15.

Figure 43 Historical whole farm performance – South

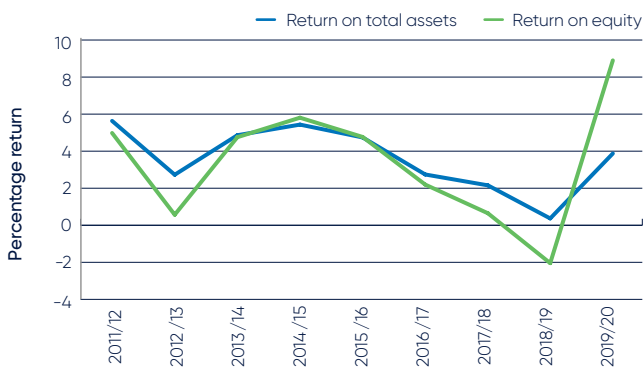


Figure 45 Regional historical earnings before interest and tax (real \$)



Figure 44 Historical farm profitability – South

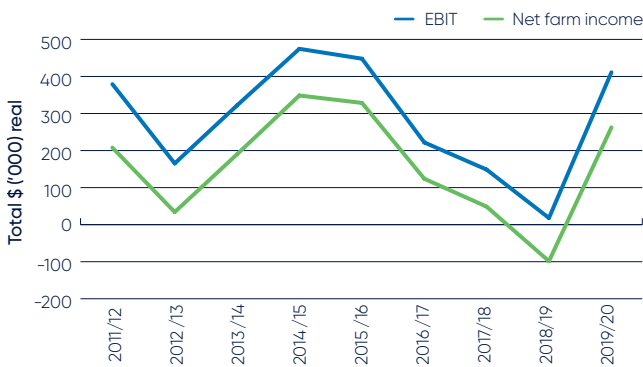
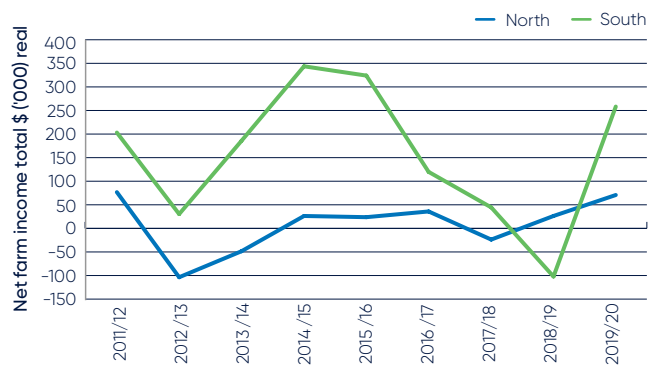


Figure 46 Regional historical net farm income (real \$)



Regional comparison

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

In 2019/20 the South reversed its downward trend of the past five years back to the fifth highest level of profitability in nine years. It showed a higher return than the North farms.

The North farms again, experienced an improvement in profit compared to the previous year.

The South has performed well over time relative to the North, and for total earnings before interest and tax in real terms the South's performance had surpassed that of the North until 2018/19. This year has seen a return to the stronger position. 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, with the exception being in the 2018/19 year. This is primarily due to the cost of production in the South being consistently lower than the North.

Figure 47 Regional historical return on total assets

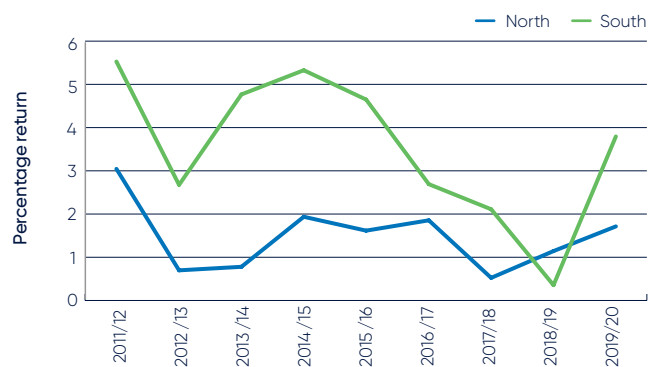
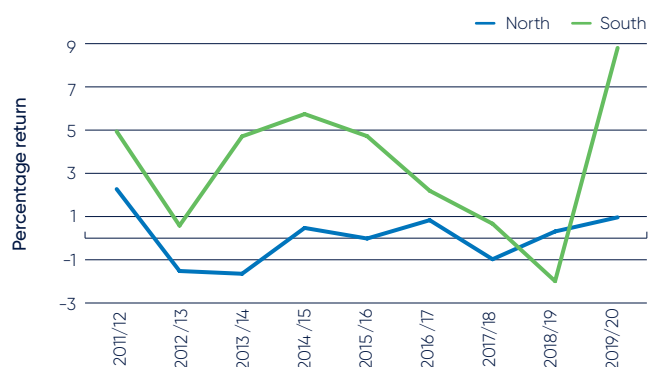


Figure 48 Regional historical return on equity



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	8.88	0.97	9.85	5.44	3.35	62	1.05	2.7	0.59	6	0.46	4.7
Top 25	8.57	1.06	9.62	4.37	2.65	62	2.60	6.6	0.65	7	1.95	11.9

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	365	143	0.6	384	1.2	512	625	4.1	3.3
Top 25	443	215	0.8	489	1.2	572	659	4.2	3.4

	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	5.4	1.8	51%	200	24	30	18	76	39,094
Top 25*	5.5	1.1	58%	187	28	34	11	92	50,542

*on milking area

Table A3 Purchased feed

	Purchased feed per milker	Concentrate price	Silage price	Hay price	Other feed price	Average purchased feed price	% of total energy imported
	t DM/hd	\$/t DM	\$/t DM	\$/t DM	\$/t DM	\$/t DM	% of ME
Average	3.8	555	308	407	469	490	49
Top 25	3.3	531	192	381	236	476	42

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	0.18	0.06	0.15	0.13	0.65	0.45	0.16	0.19
Top 25	0.15	0.13	0.05	0.12	0.12	0.57	0.42	0.14	0.19

	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	0.18	0.33	0.03	0.96	2.70	0.05	(0.27)	4.79	5.44
Top 25	0.16	0.29	0.03	0.47	2.22	0.06	(0.21)	3.80	4.37

Table A5 Overhead costs

	Rates	Farm insurance	Motor vehicle expenses	Repairs and maintenance	Other overheads	Employed labour	Total cash overheads	Depreciation	Imputed owner/operator and family labour	Total overheads
	\$ kg/MS	\$ kg/MS	\$ kg/MS	\$ kg/MS	\$ kg/MS	\$ kg/MS	\$ kg/MS	\$ kg/MS	\$ kg/MS	\$ kg/MS
Average	0.07	0.10	0.05	0.46	0.18	1.13	1.98	0.37	1.00	3.35
Top 25	0.05	0.11	0.03	0.40	0.15	0.90	1.63	0.34	0.68	2.65

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	1.5	2.1	0.7	1.6	1.5	7.4	5.3	2.0	2.3
Top 25	2.1	1.9	0.7	1.6	1.7	8.1	6.0	2.0	2.8

	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	3.9	0.3	10.3	30.9	0.6	-3.0	54.7	62.0
Top 25	2.2	4.2	0.5	6.9	31.5	0.9	-2.8	54.4	62.4

Table A7 Overhead costs – percentage

	Rates	Farm insurance	Motor vehicle expenses	Repairs and maintenance	Other	Employed labour	Total cash overheads	Depreciation	Imputed owner/operator and family labour	Total
	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs
Average	0.7	1.2	0.5	5.3	2.0	13.1	22.8	4.3	10.8	38.0
Top 25	0.7	1.5	0.4	5.8	2.1	12.8	23.2	4.8	9.5	37.6

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	16,883	14,003	2,268	2,074	1,780	2,818	450	728	22,889
Top 25	15,047	12,180	4,882	4,863	1,511	2,793	424	528	20,023

	Liabilities		Equity	
	Liabilities per usable hectare	Liabilities per milking cow	Equity per usable hectare	Average equity
	\$/ha	\$/cow	\$/ha	%
Average	7,023	5,590	16,267	73
Top 25	6,884	5,930	13,139	66

Table A9 Historical data – average farm income, costs and profit per kilogram of milk solids

Year	Income				Variable costs							
	Milk income (net)		Gross farm income		Herd costs		Shed costs		Feed costs		Total variable costs	
	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)
2013/14	7.15	7.89	8.00	8.82	0.31	0.34	0.30	0.33	3.46	3.81	4.06	4.48
2014/15	7.46	8.04	8.44	9.10	0.32	0.35	0.29	0.32	3.55	3.83	4.16	4.49
2015/16	7.34	7.81	8.23	8.76	0.35	0.37	0.27	0.28	3.33	3.54	3.94	4.19
2016/17	6.89	7.20	7.94	8.29	0.38	0.39	0.26	0.28	3.27	3.42	3.91	4.08
2017/18	7.27	7.45	8.00	8.20	0.36	0.37	0.28	0.29	3.89	3.99	4.53	4.64
2018/19	7.74	7.84	8.68	8.79	0.31	0.32	0.31	0.31	4.49	4.55	5.11	5.18
2019/20	8.88	8.88	9.85	9.85	0.37	0.37	0.28	0.28	4.79	4.79	5.44	5.44
Average	7.82	8.82	8.78	8.78	0.36	0.36	0.30	0.30	3.89	3.89	4.56	4.56

Note: 'Real' dollar values are the nominal values converted to 2019/20 dollar equivalents by the consumer price index (CPI) to allow for inflation. The gross income in 2019/20 did not include feed inventory changes and changes to the value of carry-over water. These were included in feed costs.

Year	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			
	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
2013/14	1.80	1.99	1.25	1.38	3.05	3.36	0.88	0.97	0.62	0.69	0.26	0.29	2.6%	1.3%
2014/15	1.71	1.84	1.25	1.35	2.96	3.19	1.32	1.42	0.60	0.64	0.72	0.78	3.5%	2.8%
2015/16	1.75	1.86	1.41	1.50	3.16	3.36	1.12	1.19	0.54	0.57	0.58	0.62	3.0%	2.1%
2016/17	1.80	1.88	1.31	1.37	3.11	3.25	0.92	0.96	0.51	0.54	0.41	0.43	2.2%	1.4%
2017/18	1.70	1.74	1.44	1.48	3.14	3.22	0.33	0.34	0.51	0.53	(0.18)	(0.18)	1.2%	-0.3%
2018/19	1.88	1.90	1.32	1.33	3.19	3.24	0.38	0.38	0.54	0.54	(0.16)	(0.16)	0.7%	-0.8%
2019/20	1.98	1.98	1.37	1.37	3.35	3.35	1.05	1.05	0.59	0.59	0.46	0.46	2.7%	4.7%
Average	1.88	1.88	1.40	1.40	3.28	3.28	0.94	0.94	0.61	0.61	0.33	0.33	2.4%	1.6%

Table A10 Historical data – average farm physical information

	Total usable area	Milking area	Water used	Number of milking cows	Milking cows per useable area	Milk sold	Milk sold	Estimated grazed pasture*	Estimated conserved feed*	Home grown feed as of ME consumed	Concentrate price	
Year	ha	ha	mm/ha	hd	hd/ha	kg MS/cow	kg MS/ha	t DM/ha	t DM/ha	% of ME	Nominal (\$/t DM)	Real (\$/t DM)
2013/14	301	119	0.60	309	1.1	504	569	6.0	1.1	57	412	454
2014/15	287	128	0.51	338	1.2	506	602	6.5	1.8	58	413	445
2015/16	287	126	0.55	351	1.3	504	618	6.2	2.1	55	392	417
2016/17	263	120	0.56	326	1.3	498	646	6.9	1.6	59	357	373
2017/18	251	118	0.67	337	1.4	488	683	6.0	1.6	56	423	434
2018/19	342	144	0.74	373	1.3	491	610	6.3	1.8	60	567	575
2019/20	365	143	0.57	384	1.2	512	625	5.4	1.8	51	555	555
Average	303	130	0.58	349	1.27	497	625	6.29	1.60	57		441

*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	9.27	1.77	11.04	6.21	5.28	54	(0.45)	-0.8	0.06	1%	(0.51)	-1.0
NN0003	8.73	0.02	8.75	4.80	3.84	56	0.11	0.3	0.44	5%	(0.33)	-1.5
NN0005	9.31	0.41	9.72	5.35	4.16	56	0.21	0.7	-	0%	0.21	0.7
NN0007	8.25	0.55	8.80	3.55	3.76	49	1.50	2.3	0.57	6%	0.93	2.1
NN0008	9.26	0.81	10.07	6.53	3.23	67	0.31	1.2	-	0%	0.31	1.2
NN0021	8.86	1.04	9.89	3.60	4.08	47	2.22	3.3	0.22	2%	2.00	3.3
NN0023	9.44	0.79	10.24	6.69	6.78	50	(3.24)	-4.9	0.32	3%	(3.55)	-5.9
NN0024	9.17	0.95	10.12	5.85	3.73	61	0.54	1.1	0.42	4%	0.12	0.4
NN0025	9.61	0.98	10.58	5.25	3.89	57	1.44	3.2	1.20	11%	0.24	0.8
NN0027	10.71	0.59	11.29	6.46	3.33	66	1.50	4.0	0.81	7%	0.69	3.5
NN0030	9.56	0.83	10.39	5.74	5.22	52	(0.57)	-1.1	1.01	10%	(1.57)	-8.0
NN0031	8.85	0.77	9.62	4.05	2.90	58	2.68	8.2	0.26	3%	2.42	9.4
NN0032	9.39	0.94	10.33	7.11	3.13	69	0.10	0.3	0.07	1%	0.02	0.1
NN0033	9.40	2.70	12.10	6.25	3.60	63	2.24	4.9	0.42	4%	1.82	5.0
NN0036	9.80	1.31	11.12	8.34	3.15	73	(0.37)	-0.7	1.13	10%	(1.50)	-5.1
NN0037	9.99	0.94	10.93	6.16	3.60	63	1.17	2.7	0.66	6%	0.51	2.4
NN0038	9.99	0.84	10.83	5.75	4.76	55	0.33	0.4	0.61	6%	(0.29)	-0.4
NN0039	9.01	1.39	10.40	4.10	3.53	54	2.77	5.2	0.84	8%	1.93	8.9
Average	9.37	0.98	10.35	5.65	4.00	58	0.69	1.7	0.50	0.05	0.19	0.9

Table B2 Physical information

Farm number	Total usable area ha	Milking area ha	Total water use efficiency t DM/100mm/ha	Number of milking cows hd	Milking cows per usable area hd/ha	Milk sold kg MS/cow	Milk sold kg MS/ha	Fat %	Protein %
NN0002	152	50	0.31	80	0.53	493	259	4.0	3.2
NN0003	215	89	0.56	395	1.84	369	678	4.2	3.3
NN0005	193	80	0.64	290	1.50	511	768	4.1	3.3
NN0007	255	130	0.68	218	0.85	501	428	3.9	3.2
NN0008	260	130	0.58	320	1.23	562	692	4.1	3.2
NN0021	88	60	1.24	170	1.93	393	759	4.6	3.6
NN0023	85	36	0.45	85	1.00	446	446	3.7	3.2
NN0024	271	130	0.47	230	0.85	462	392	3.9	3.0
NN0025	260	120	0.60	443	1.70	467	796	3.9	3.1
NN0027	240	96	0.27	373	1.55	549	854	3.8	3.3
NN0030	100	70	0.55	167	1.67	437	731	4.0	3.2
NN0031	343	188	0.71	590	1.72	402	692	4.9	3.5
NN0032	1,085	450	0.35	747	0.69	494	340	3.7	3.2
NN0033	1,378	1	0.20	562	0.41	438	179	4.2	3.4
NN0036	227	55	0.29	260	1.15	474	544	4.1	3.1
NN0037	227	92	0.31	312	1.37	479	659	3.7	3.1
NN0038	148	53	0.38	150	1.01	454	460	3.6	3.2
NN0039	130	78	0.38	176	1.35	557	754	4.5	3.6
Average	314	106	0.50	309	1.24	472	579	4.0	3.3

Farm number	Estimated grazed pasture* t DM/ha	Estimated conserved feed* t DM/ha	Home grown feed as % of ME consumed % of ME	Nitrogen application kg/ha	Phosphorous application kg/ha	Potassium application kg/ha	Sulphur application kg/ha	Labour efficiency hd/FTE	Labour efficiency kg MS/FTE
NN0002	3.65	1.05	61%	148	26	42	13	44	21,563
NN0003	9.56	-	77%	46	-	-	54	74	27,127
NN0005	9.47	-	60%	425	4	130	18	56	28,744
NN0007	7.62	2.13	77%	134	-	-	-	55	27,525
NN0008	4.15	4.94	56%	393	17	28	-	67	37,421
NN0021	3.84	9.58	63%	210	74	122	84	80	31,294
NN0023	7.61	-	59%	159	19	28	32	35	15,424
NN0024	3.99	1.05	48%	61	34	18	25	68	31,597
NN0025	11.54	0.79	68%	169	48	90	32	74	34,722
NN0027	4.16	2.28	27%	445	-	35	10	62	34,154
NN0030	6.56	0.38	52%	225	23	15	11	53	23,119
NN0031	8.76	2.55	74%	277	98	147	7	90	36,171
NN0032	0.87	-	29%	181	-	17	38	83	40,901
NN0033	-0.04	-	43%	-	-	-	-	71	31,262
NN0036	7.15	-	46%	433	3	103	102	74	35,183
NN0037	6.85	0.45	40%	230	30	27	12	61	29,139
NN0038	4.83	1.35	45%	145	21	17	0	53	24,223
NN0039	7.44	1.18	65%	260	30	37	7	68	37,781
Average	6.00	2.31	55%	219	24	48	25	65	30,408

*on milking area

Table B3 Purchased feed

Farm number	Purchased feed per milker	Concentrate price	Silage price	Hay price	Other feed price	Average purchased feed price	% of total energy imported
	t DM/hd	\$/t DM	\$/t DM	\$/t DM	\$/t DM	\$/t DM	% of ME
NN0002	3.16	684	360	493	-	602	39
NN0003	1.26	625	-	-	-	625	23
NN0005	2.77	520	-	720	572	569	40
NN0007	1.78	567	-	-	-	567	23
NN0008	3.32	597	443	607	482	563	44
NN0021	2.04	496	-	-	-	496	37
NN0023	3.62	580	-	499	-	537	41
NN0024	4.58	475	-	409	859	449	52
NN0025	2.36	580	-	449	-	554	32
NN0027	5.29	490	-	421	-	477	73
NN0030	3.03	655	183	382	-	483	48
NN0031	1.48	601	-	-	-	601	26
NN0032	5.86	482	-	589	-	532	71
NN0033	4.70	478	152	297	294	422	57
NN0036	4.26	975	169	460	424	677	54
NN0037	4.50	547	588	370	941	499	60
NN0038	3.98	634	559	355	183	454	55
NN0039	2.20	562	-	-	-	562	35
Average	3.34	586	351	465	536	537	45

Table B4 Variable costs

Farm number	AI and herd test	Animal health	Calf rearing	Shed power	Dairy supplies	Total herd and shed costs	Fertiliser	Irrigation	Hay and silage making
	\$ kg/MS	\$ kg/MS	\$ kg/MS	\$ kg/MS	\$ kg/MS	\$ kg/MS	\$ kg/MS	\$ kg/MS	\$ kg/MS
NN0002	0.12	0.26	-	0.17	0.21	0.75	0.50	0.10	0.26
NN0003	0.20	0.21	0.04	0.17	0.09	0.71	0.67	-	0.80
NN0005	0.17	0.22	0.00	0.18	0.09	0.66	0.71	0.32	0.13
NN0007	0.05	0.16	-	0.13	0.17	0.51	0.23	0.60	0.08
NN0008	0.31	0.35	0.00	0.11	0.09	0.87	1.06	0.34	0.51
NN0021	0.03	0.29	0.04	0.17	0.13	0.64	0.78	0.46	0.16
NN0023	0.10	0.26	-	0.55	0.23	1.15	0.39	0.24	-
NN0024	0.12	0.23	0.02	0.17	0.14	0.67	0.29	0.09	0.18
NN0025	0.14	0.27	0.09	0.15	0.23	0.88	0.82	0.14	0.31
NN0027	0.11	0.26	0.02	0.11	0.10	0.61	0.41	0.14	0.05
NN0030	0.10	0.11	0.02	0.20	0.17	0.59	0.84	-	0.04
NN0031	0.31	0.06	0.11	0.16	0.16	0.80	0.73	0.01	0.06
NN0032	0.08	0.32	0.02	0.11	0.10	0.63	0.52	0.04	0.36
NN0033	0.01	0.15	0.01	0.14	0.08	0.40	0.03	-	0.36
NN0036	0.14	0.28	0.33	0.13	0.23	1.11	0.46	0.08	0.18
NN0037	0.27	0.23	-	0.17	0.07	0.73	0.36	-	0.04
NN0038	0.26	0.15	0.23	0.12	0.15	0.91	0.34	0.10	0.27
NN0039	0.10	0.15	0.21	0.18	0.19	0.83	0.52	-	0.08
Average	0.15	0.22	0.06	0.17	0.14	0.75	0.54	0.15	0.21

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	0.20	0.27	-	1.31	3.30	-	(0.47)	5.46	6.21
NN0003	0.17	0.73	0.01	-	2.21	-	(0.50)	4.09	4.80
NN0005	0.10	0.29	-	0.91	2.25	-	(0.03)	4.68	5.35
NN0007	0.12	0.38	-	-	1.96	-	(0.32)	3.03	3.55
NN0008	0.14	0.65	-	0.56	2.73	-	(0.31)	5.66	6.53
NN0021	0.35	0.33	-	-	2.72	0.03	(1.87)	2.96	3.60
NN0023	0.20	0.34	-	2.29	2.35	-	(0.27)	5.54	6.69
NN0024	0.12	0.39	0.08	1.79	2.65	-	(0.41)	5.18	5.85
NN0025	0.25	0.42	0.02	0.47	2.49	-	(0.55)	4.37	5.25
NN0027	0.27	0.37	-	0.78	3.95	0.02	(0.14)	5.86	6.46
NN0030	0.22	0.25	0.39	0.97	2.64	-	(0.20)	5.16	5.74
NN0031	0.36	0.46	-	-	2.23	-	(0.61)	3.25	4.05
NN0032	0.18	0.66	-	3.45	3.17	-	(1.89)	6.47	7.11
NN0033	0.66	0.15	-	0.43	4.53	-	(0.31)	5.85	6.25
NN0036	0.13	0.38	-	1.54	4.49	-	(0.02)	7.23	8.34
NN0037	0.10	0.27	-	1.46	3.27	-	(0.07)	5.43	6.16
NN0038	0.07	0.35	0.08	0.84	3.13	-	(0.35)	4.84	5.75
NN0039	0.13	0.23	0.26	-	2.20	0.16	(0.31)	3.27	4.10
Average	0.21	0.38	0.05	0.93	2.91	0.01	(0.48)	4.91	5.65

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	0.07	0.24	0.08	0.71	0.36	1.32	2.78	0.40	2.10	5.28
NN0003	0.08	0.07	0.09	0.24	0.46	1.72	2.67	0.18	0.99	3.84
NN0005	0.05	0.06	0.06	0.92	0.19	1.54	2.81	0.34	1.01	4.16
NN0007	0.06	0.08	0.03	0.36	0.13	1.09	1.77	0.41	1.58	3.76
NN0008	0.03	0.07	0.03	0.75	0.03	2.06	2.96	0.27	-	3.23
NN0021	0.05	0.23	0.05	0.80	0.11	0.64	1.87	0.67	1.53	4.08
NN0023	0.14	0.17	0.07	0.81	0.30	0.04	1.52	0.30	4.96	6.78
NN0024	0.06	0.15	0.08	0.46	0.15	1.68	2.59	0.33	0.81	3.73
NN0025	0.09	0.09	0.04	0.65	0.15	1.36	2.38	0.67	0.84	3.89
NN0027	0.06	0.08	0.06	0.43	0.29	1.23	2.16	0.41	0.76	3.33
NN0030	0.17	0.11	0.06	0.47	0.30	0.83	1.94	0.75	2.52	5.22
NN0031	0.04	0.06	0.01	0.32	0.06	0.52	1.01	0.39	1.49	2.90
NN0032	0.16	0.07	0.08	0.53	0.17	1.71	2.71	0.19	0.22	3.13
NN0033	0.07	0.05	0.05	0.31	0.32	2.06	2.85	0.50	0.25	3.60
NN0036	0.27	0.09	0.05	0.43	0.06	1.09	1.97	0.24	0.94	3.15
NN0037	0.04	0.10	0.04	0.24	0.20	1.89	2.52	0.52	0.56	3.60
NN0038	0.11	0.06	0.15	0.52	0.45	0.23	1.53	0.30	2.93	4.76
NN0039	0.06	0.03	0.02	0.47	0.53	0.01	1.13	0.37	2.03	3.53
Average	0.09	0.10	0.06	0.52	0.24	1.17	2.18	0.40	1.42	4.00

Table B6 Variable costs – percentage

Farm number	AI and herd test	Animal health	Calf rearing	Shed power	Dairy supplies	Total herd & shed costs	Fertiliser	Irrigation	Hay and silage making
	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs
NN0002	1.1	2.2	0.0	1.4	1.8	6.6	4.3	0.9	2.2
NN0003	2.3	2.4	0.5	2.0	1.0	8.2	7.7	0.0	9.2
NN0005	1.8	2.3	0.0	1.9	0.9	7.0	7.5	3.3	1.4
NN0007	0.7	2.2	0.0	1.7	2.4	7.0	3.1	8.2	1.1
NN0008	3.2	3.6	0.0	1.1	0.9	8.9	10.8	3.4	5.2
NN0021	0.3	3.7	0.5	2.2	1.6	8.4	10.1	6.0	2.1
NN0023	0.8	1.9	0.0	4.1	1.7	8.5	2.9	1.8	0.0
NN0024	1.3	2.4	0.2	1.7	1.4	7.0	3.0	0.9	1.8
NN0025	1.6	2.9	1.0	1.6	2.6	9.7	8.9	1.5	3.4
NN0027	1.1	2.7	0.2	1.2	1.0	6.2	4.2	1.4	0.5
NN0030	0.9	1.0	0.2	1.8	1.6	5.4	7.7	0.0	0.3
NN0031	4.5	0.9	1.5	2.4	2.3	11.6	10.5	0.1	0.9
NN0032	0.8	3.1	0.2	1.1	1.0	6.2	5.1	0.3	3.5
NN0033	0.1	1.5	0.1	1.4	0.9	4.0	0.3	0.0	3.7
NN0036	1.3	2.4	2.9	1.1	2.0	9.6	4.0	0.7	1.6
NN0037	2.7	2.4	0.0	1.7	0.7	7.5	3.7	0.0	0.5
NN0038	2.5	1.4	2.2	1.1	1.4	8.6	3.2	1.0	2.5
NN0039	1.3	2.0	2.8	2.4	2.4	10.9	6.8	0.0	1.1
Average	1.6	2.3	0.7	1.8	1.5	7.8	5.8	1.6	2.3

Farm number	Fuel and oil	Pasture improvement/cropping	Other feed costs	Fodder purchases	Grain/concentrates/other	Agistment costs	Feed and water inventory change	Total feed costs	Total variable costs
	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs
NN0002	1.8	2.3	0.0	11.4	28.8	0.0	-4.1	47.5	54.1
NN0003	1.9	8.5	0.1	0.0	25.6	0.0	-5.8	47.4	55.6
NN0005	1.0	3.0	0.0	9.6	23.7	0.0	-0.3	49.2	56.2
NN0007	1.7	5.2	0.0	0.0	26.9	0.0	-4.3	41.5	48.6
NN0008	1.4	6.6	0.0	5.7	27.9	0.0	-3.2	58.0	66.9
NN0021	4.5	4.3	0.0	0.0	35.4	0.3	-24.4	38.5	46.9
NN0023	1.5	2.5	0.0	17.0	17.5	0.0	-2.0	41.1	49.6
NN0024	1.3	4.1	0.8	18.7	27.7	0.0	-4.3	54.1	61.1
NN0025	2.8	4.6	0.2	5.2	27.3	0.0	-6.1	47.8	57.4
NN0027	2.8	3.7	0.0	8.0	40.3	0.2	-1.4	59.8	66.0
NN0030	2.0	2.3	3.6	8.9	24.1	0.0	-1.9	47.0	52.4
NN0031	5.2	6.7	0.0	0.0	32.2	0.0	-8.8	46.7	58.3
NN0032	1.7	6.5	0.0	33.7	31.0	0.0	-18.5	63.3	69.4
NN0033	6.7	1.5	0.0	4.4	45.9	0.0	-3.2	59.4	63.4
NN0036	1.1	3.3	0.0	13.4	39.1	0.0	-0.2	62.9	72.6
NN0037	1.0	2.8	0.0	14.9	33.5	0.0	-0.8	55.6	63.1
NN0038	0.7	3.3	0.8	8.0	29.8	0.0	-3.3	46.0	54.7
NN0039	1.6	3.0	3.5	0.0	28.8	2.0	-4.0	42.8	53.7
Average	2.3	4.1	0.5	8.8	30.3	0.1	-5.4	50.5	58.3

Table B7 Overhead costs – percentage

Farm number	Rates	Farm insurance	Motor vehicle expenses	Repairs and maintenance	Other	Employed labour	Total cash	Depreciation	Imputed owner/operator and family labour	Total
	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs
NN0002	0.6	2.1	0.7	6.2	3.1	11.5	24.2	3.5	18.3	45.9
NN0003	1.0	0.8	1.1	2.8	5.3	19.9	30.9	2.1	11.4	44.4
NN0005	0.5	0.6	0.6	9.6	2.0	16.2	29.6	3.6	10.6	43.8
NN0007	0.8	1.2	0.5	5.0	1.8	14.9	24.2	5.6	21.7	51.4
NN0008	0.3	0.7	0.3	7.7	0.3	21.1	30.3	2.8	0.0	33.1
NN0021	0.6	3.0	0.6	10.4	1.5	8.4	24.4	8.7	20.0	53.1
NN0023	1.0	1.2	0.5	6.0	2.3	0.3	11.3	2.3	36.8	50.4
NN0024	0.7	1.5	0.9	4.8	1.6	17.6	27.0	3.4	8.5	38.9
NN0025	1.0	0.9	0.5	7.1	1.6	14.9	26.0	7.3	9.2	42.6
NN0027	0.6	0.9	0.6	4.4	3.0	12.5	22.0	4.2	7.8	34.0
NN0030	1.5	1.0	0.6	4.3	2.8	7.6	17.7	6.9	23.0	47.6
NN0031	0.5	0.9	0.1	4.6	0.9	7.5	14.6	5.6	21.5	41.7
NN0032	1.6	0.6	0.8	5.1	1.6	16.7	26.5	1.9	2.2	30.6
NN0033	0.8	0.5	0.5	3.1	3.2	20.9	29.0	5.1	2.5	36.6
NN0036	2.3	0.8	0.4	3.7	0.5	9.5	17.1	2.1	8.2	27.4
NN0037	0.4	1.1	0.4	2.5	2.0	19.3	25.8	5.3	5.8	36.9
NN0038	1.1	0.6	1.4	5.0	4.3	2.2	14.6	2.8	27.9	45.3
NN0039	0.8	0.4	0.3	6.1	7.0	0.2	14.8	4.8	26.6	46.3
Average	0.9	1.0	0.6	5.5	2.5	12.3	22.8	4.3	14.6	41.7

Table B8 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	18,177	15,160	1,649	1,474	1,879	2,872	377	858	24,892	
Liabilities				Equity						
Liabilities per usable hectare		Liabilities per milking cow		Equity per usable hectare			Average equity			
\$/ha		\$/cow		\$/ha			%			
Average		6,581		4,940		19,042			79	

Table B9 Historical data – average farm income, costs and profit per kilogram of milk solids

Income					Variable costs							
Year	Milk income (net)		Gross farm income		Herd costs		Shed costs		Feed costs		Total variable costs	
	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)
2013/14	7.17	7.91	8.01	8.84	0.30	0.33	0.37	0.41	3.68	4.06	4.35	4.80
2014/15	7.62	8.22	8.61	9.28	0.35	0.37	0.36	0.39	3.78	4.07	4.48	4.83
2015/16	7.65	8.14	8.46	9.01	0.34	0.36	0.31	0.33	3.61	3.84	4.26	4.53
2016/17	7.28	7.60	8.25	8.62	0.35	0.37	0.31	0.32	3.46	3.61	4.12	4.30
2017/18	7.62	7.81	8.39	8.60	0.38	0.39	0.33	0.34	4.09	4.19	4.79	4.91
2018/19	8.07	8.18	9.16	9.28	0.33	0.33	0.35	0.36	4.45	4.51	5.13	5.20
2019/20	9.37	9.37	10.35	10.35	0.43	0.43	0.32	0.32	4.91	4.91	5.65	5.65
Average		8.14		9.09		0.37		0.35		4.08		4.80

Overhead costs							Profit							
Year	Cash overhead costs		Non-cash overhead costs		Total overhead costs		Earnings before interest and tax		Interest and lease charges		Net farm income		Return on total assets	Return on equity
	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)		
2013/14	2.02	2.23	1.34	1.48	3.36	3.71	0.29	0.32	0.64	0.70	-0.34	(0.38)	0.8%	-1.7%
2014/15	1.87	2.01	1.45	1.56	3.31	3.57	0.82	0.88	0.63	0.68	0.19	0.20	1.9%	0.4%
2015/16	1.96	2.09	1.62	1.72	3.58	3.81	0.62	0.66	0.53	0.57	0.09	0.10	1.6%	-0.1%
2016/17	1.92	2.00	1.46	1.53	3.38	3.53	0.75	0.78	0.52	0.54	0.23	0.24	1.8%	0.8%
2017/18	1.86	1.90	1.61	1.65	3.46	3.55	0.13	0.13	0.46	0.47	-0.33	(0.34)	0.5%	-1.0%
2018/19	2.16	2.19	1.43	1.45	3.59	3.64	0.43	0.44	0.47	0.48	-0.04	(0.04)	1.1%	0.2%
2019/20	2.18	2.18	1.82	1.82	4.00	4.00	0.69	0.69	0.50	0.50	0.19	0.19	1.7%	0.9%
Average		2.11		1.59		3.69		0.60		0.57		0.03	1.5%	0.0%

Note: 'Real' dollar values are the nominal values converted to 2019/20 dollar equivalents by the consumer price index (CPI) to allow for inflation. The gross income in 2019/20 did not include feed inventory changes and changes to the value of carry-over water. These were included in feed costs.

Table B10 Historical data – average farm physical information

Year	Total usable area	Milking area	Total water use efficiency	Number of milking cows	Milking cows per useable area	Milk sold	Milk sold	Estimated grazed pasture*	Estimated conserved feed*	Home grown feed as of ME consumed	Concentrate price	
	ha	ha	t DM/100mm/ha	hd	hd/ha	kg MS/cow	kg MS/ha	t DM/ha	t DM/ha	% of ME	Nominal (\$/t DM)	Real (\$/t DM)
2013/14	231	102	0.59	272	1.2	471	590	5.8	1.2	60	444	490
2014/15	215	95	0.48	259	1.3	477	606	6.4	1.8	59	434	468
2015/16	210	95	0.53	289	1.4	463	636	5.9	2.3	52	401	427
2016/17	188	88	0.49	259	1.4	477	680	7.2	1.5	62	376	393
2017/18	188	94	0.60	288	1.5	459	698	7.1	1.6	57	442	453
2018/19	299	108	0.68	328	1.3	443	580	7.2	2.0	64	581	589
2019/20	314	106	0.50	309	1.2	472	579	6.0	2.3	55.00	586	586
Average	248	103	0.53	296	1.35	465	620	6.54	1.77	59		460

*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	8.70	2.13	10.83	6.38	3.24	66	1.21	1.8%	0.96	9%	0.24	0.7
SN0006	8.51	1.39	9.91	5.81	2.93	66	1.16	3.1%	0.79	8%	0.37	2.2
SN0009	7.21	0.78	7.99	7.86	3.31	70	(3.17)	-4.8%	1.01	13%	(4.18)	-9.3
SN0014	7.30	0.69	7.98	4.49	2.19	67	1.30	4.9%	0.46	6%	0.85	5.5
SN0021	7.18	0.80	7.97	4.73	2.26	68	0.98	3.7%	-	0%	0.98	3.7
SN0022	9.49	0.36	9.84	3.39	2.08	62	4.38	5.6%	1.20	12%	3.18	8.5
SN0023	7.83	0.57	8.40	5.05	2.17	70	1.19	4.8%	0.20	2%	1.00	5.3
SN0024	9.10	1.22	10.32	4.59	2.18	68	3.55	6.4%	0.72	7%	2.84	22.7
SN0026	8.44	0.38	8.82	5.16	2.72	65	0.94	2.6%	1.26	14%	(0.33)	-5.3
SN0028	7.18	0.48	7.66	5.17	1.50	77	0.99	5.1%	0.12	2%	0.87	6.6
SN0029	9.10	1.73	10.82	4.55	3.37	57	2.90	9.0%	0.66	6%	2.24	11.6
SN0031	9.44	0.43	9.86	6.32	2.77	70	0.78	2.2%	0.54	5%	0.23	1.1
SN0032	8.71	1.29	10.00	3.69	3.20	54	3.12	7.5%	0.85	9%	2.27	8.6
SN0033	8.37	1.59	9.96	5.29	2.93	64	1.74	7.7%	0.79	8%	0.95	24.8
SN0034	8.94	0.38	9.31	5.46	2.79	66	1.06	1.4%	0.95	10%	0.11	0.4
SN0035	8.78	1.20	9.98	4.89	2.79	64	2.30	3.8%	0.76	8%	1.54	64.0
SN0036	7.93	0.77	8.70	5.84	3.00	66	(0.14)	-0.5%	0.38	4%	(0.51)	-2.4
Average	8.36	0.95	9.32	5.22	2.67	66	1.43	3.8%	0.68	7%	0.74	8.8

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	254	95	0.4	352	1.4	517	717	3.9%	3.4%
SN0006	223	71	0.8	315	1.4	487	688	4.0%	3.3%
SN0009	280	3	0.1	270	1.0	470	453	4.1%	3.4%
SN0014	589	185	0.8	380	0.6	650	420	4.4%	3.5%
SN0021	1,210	434	0.8	1,251	1.0	540	558	5.3%	3.9%
SN0022	850	240	0.6	870	1.0	433	444	4.2%	3.4%
SN0023	110	82	1.0	166	1.5	539	813	4.1%	3.4%
SN0024	231	134	0.7	280	1.2	571	692	3.7%	3.4%
SN0026	185	88	0.3	250	1.4	614	830	4.9%	3.7%
SN0028	748	748	0.7	940	1.3	642	807	4.4%	3.5%
SN0029	372	1	1.1	370	1.0	887	883	3.6%	3.1%
SN0031	655	250	0.1	510	0.8	577	449	4.1%	3.3%
SN0032	270	115	1.4	441	1.6	541	883	4.0%	3.3%
SN0033	450	250	0.5	350	0.8	461	359	4.0%	3.3%
SN0034	277	105	0.5	387	1.4	573	800	3.7%	3.0%
SN0035	236	154	0.6	400	1.7	475	806	3.8%	3.3%
SN0036	190	125	0.8	345	1.8	464	842	4.0%	3.3%
Average	419	181	0.7	463	1.2	555	673	4.1%	3.4%

Farm number	Estimated grazed pasture*	Estimated conserved feed*	Home grown feed as % of ME consumed	Nitrogen application	Phosphorous application	Potassium application	Sulphur application	Labour efficiency	Labour efficiency
	t DM/ha	t DM/ha	% of ME	kg/ha	kg/ha	kg/ha	kg/ha	hd/FTE	kg MS/FTE
SN0002	4.7	0.4	40%	229	30	13	0	70	36,369
SN0006	9.0	1.7	58%	288	32	49	20	84	41,034
SN0009	0.0	-	6%	-	-	-	-	66	31,115
SN0014	4.5	0.2	55%	74	14	-	1	99	64,703
SN0021	4.4	0.1	62%	110	16	-	5	128	69,188
SN0022	8.4	1.0	67%	288	20	-	2	140	60,753
SN0023	6.4	2.2	60%	337	38	-	47	97	52,127
SN0024	5.8	1.1	52%	193	24	-	2	99	56,523
SN0026	3.8	-	25%	37	-	-	-	69	42,109
SN0028	1.6	1.5	35%	88	22	5	5	117	74,975
SN0029	0.0	-	56%	-	-	-	-	44	39,401
SN0031	3.1	-	13%	323	10	15	8	68	39,419
SN0032	10.2	1.0	68%	394	21	114	73	82	44,429
SN0033	2.5	0.2	47%	112	23	3	2	87	40,140
SN0034	7.4	2.2	43%	203	133	-	11	86	49,255
SN0035	4.1	1.7	47%	246	8	-	1	88	41,750
SN0036	5.7	3.2	60%	144	11	10	3	81	37,643
Average	4.8	1.3	47%	180	24	12	11	89	48,290

*on milking area

Table C3 Purchased feed

Farm number	Purchased feed per milker	Concentrate price	Silage price	Hay price	Other feed price	Average purchased feed price	% of total energy imported
	t DM/hd	\$/t DM	\$/t DM	\$/t DM	\$/t DM	\$/t DM	% of ME
SN0002	5.13	480	-	436	-	468	60
SN0006	3.10	570	-	487	-	540	42
SN0009	8.34	580	218	235	-	356	94
SN0014	3.83	510	-	278	-	383	45
SN0021	2.47	449	-	-	412	430	38
SN0022	1.84	541	-	328	-	507	33
SN0023	2.79	544	-	263	-	442	40
SN0024	3.20	530	-	580	-	537	48
SN0026	5.79	655	303	218	286	372	75
SN0028	5.87	487	250	243	-	342	65
SN0029	4.47	525	-	-	-	525	44
SN0031	6.57	555	340	276	-	395	87
SN0032	2.55	499	-	421	236	388	32
SN0033	4.13	526	133	439	-	440	53
SN0034	4.98	447	-	338	-	411	57
SN0035	3.47	499	-	465	-	495	53
SN0036	2.70	470	-	345	-	434	40
Average	4.19	522	249	357	311	439	53

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	0.08	0.30	0.22	0.07	0.13	0.80	0.38	0.10	0.08
SN0006	0.11	0.22	-	0.11	0.21	0.65	0.46	0.03	0.04
SN0009	0.08	0.10	0.04	0.18	0.18	0.58	0.10	0.05	0.06
SN0014	0.16	0.19	0.01	0.08	0.08	0.52	0.35	0.24	0.33
SN0021	0.06	0.08	0.02	0.09	0.06	0.31	0.47	0.75	0.20
SN0022	0.07	0.12	0.00	0.06	0.10	0.35	0.39	0.01	0.15
SN0023	0.07	0.04	-	0.11	0.16	0.37	0.80	0.28	0.26
SN0024	0.16	0.16	0.06	0.04	0.10	0.52	0.28	-	0.09
SN0026	0.11	0.11	0.08	0.22	0.08	0.60	0.03	0.04	-
SN0028	0.11	0.12	-	0.11	0.03	0.37	0.31	0.45	0.17
SN0029	0.13	0.13	-	0.20	0.27	0.73	0.20	0.26	0.49
SN0031	0.12	0.13	0.03	0.19	0.07	0.54	0.33	0.06	-
SN0032	0.14	0.16	0.09	0.12	0.08	0.58	0.55	0.03	0.26
SN0033	0.12	0.10	-	0.09	0.12	0.43	0.43	0.28	0.11
SN0034	0.16	0.29	0.23	0.14	0.19	1.01	0.47	0.01	0.19
SN0035	0.11	0.10	0.10	0.10	0.11	0.51	0.28	0.01	0.19
SN0036	0.09	0.12	0.03	0.08	0.06	0.38	0.36	0.42	0.16
Average	0.11	0.14	0.05	0.12	0.12	0.54	0.36	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
SN0002	0.16	0.19	-	1.31	3.81	-	(0.46)	5.58	6.38
SN0006	0.19	0.26	0.00	1.19	2.47	0.16	0.36	5.16	5.81
SN0009	0.35	0.25	0.02	2.61	3.98	-	(0.14)	7.27	7.86
SN0014	0.08	0.26	-	1.05	1.59	0.16	(0.20)	3.97	4.49
SN0021	0.13	0.36	-	-	2.20	0.10	0.31	4.43	4.73
SN0022	0.10	0.25	0.03	0.23	1.96	-	(0.08)	3.04	3.39
SN0023	0.06	0.52	-	0.51	1.85	0.43	(0.03)	4.67	5.05
SN0024	0.06	0.34	-	0.43	2.62	0.16	0.08	4.07	4.59
SN0026	0.20	0.22	-	1.63	2.51	0.04	(0.09)	4.57	5.16
SN0028	0.13	0.25	0.01	1.56	1.96	0.05	0.04	4.80	5.17
SN0029	0.15	0.23	-	-	3.25	-	(0.95)	3.82	4.55
SN0031	0.11	0.49	-	3.43	1.96	-	(0.69)	5.78	6.32
SN0032	0.12	0.27	-	0.28	1.55	-	0.04	3.10	3.69
SN0033	0.30	0.34	-	0.70	2.58	-	0.13	4.87	5.29
SN0034	0.09	0.17	0.11	0.98	2.66	0.02	(0.26)	4.45	5.46
SN0035	0.11	0.22	-	0.37	3.30	-	(0.10)	4.38	4.89
SN0036	0.11	0.19	-	0.63	2.10	0.33	1.16	5.46	5.84
Average	0.14	0.28	0.01	0.99	2.49	0.09	(0.05)	4.67	5.22

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	0.12	0.06	0.02	0.37	0.12	1.12	1.81	0.59	0.84	3.24
SN0006	0.02	0.16	0.07	0.20	0.13	1.41	2.00	0.54	0.40	2.93
SN0009	0.07	0.04	0.07	0.58	0.20	0.86	1.82	0.34	1.15	3.31
SN0014	0.02	0.08	0.04	0.42	0.16	0.57	1.29	0.35	0.54	2.19
SN0021	0.03	0.06	0.02	0.74	0.05	0.79	1.69	0.29	0.28	2.26
SN0022	0.03	0.07	0.04	0.39	0.10	0.86	1.50	0.26	0.32	2.08
SN0023	0.03	0.08	0.09	0.28	0.11	0.12	0.70	0.08	1.39	2.17
SN0024	0.13	0.06	0.03	0.23	0.12	0.63	1.20	0.30	0.67	2.18
SN0026	0.02	0.15	0.01	0.30	0.09	0.82	1.40	0.61	0.71	2.72
SN0028	0.01	0.04	-	0.32	0.06	0.85	1.29	0.17	0.04	1.50
SN0029	0.02	0.10	0.01	0.64	0.12	1.67	2.57	0.48	0.33	3.37
SN0031	0.02	0.07	0.02	0.41	0.08	0.84	1.44	0.37	0.96	2.77
SN0032	0.09	0.16	0.06	0.68	0.07	1.77	2.84	0.36	-	3.20
SN0033	-	0.39	-	0.11	0.15	1.18	1.83	0.37	0.73	2.93
SN0034	0.04	0.03	0.09	0.36	0.18	1.50	2.21	0.24	0.35	2.79
SN0035	-	0.03	0.02	0.23	0.22	2.20	2.69	0.09	-	2.79
SN0036	0.07	0.09	0.02	0.39	0.11	1.24	1.94	0.34	0.72	3.00
Average	0.04	0.10	0.04	0.39	0.12	1.08	1.78	0.34	0.55	2.67

Table C6 Variable costs – percentage

Farm number	AI and herd test	Animal health	Calf rearing	Shed power	Dairy supplies	Total herd and shed costs	Fertiliser	Irrigation	Hay and silage making
	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs
SN0002	1.0	3.0	2.0	1.0	1.0	8.0	4.0	1.0	1.0
SN0006	1.0	2.0	0.0	1.0	2.0	7.0	5.0	0.0	0.0
SN0009	1.0	1.0	0.0	2.0	2.0	5.0	1.0	0.0	1.0
SN0014	2.0	3.0	0.0	1.0	1.0	8.0	5.0	4.0	5.0
SN0021	1.0	1.0	0.0	1.0	1.0	4.0	7.0	11.0	3.0
SN0022	1.0	2.0	0.0	1.0	2.0	6.0	7.0	0.0	3.0
SN0023	1.0	0.0	0.0	1.0	2.0	5.0	11.0	4.0	4.0
SN0024	2.0	2.0	1.0	1.0	1.0	8.0	4.0	0.0	1.0
SN0026	1.0	1.0	1.0	3.0	1.0	8.0	0.0	0.0	0.0
SN0028	2.0	2.0	0.0	2.0	0.0	6.0	5.0	7.0	3.0
SN0029	2.0	2.0	0.0	3.0	3.0	9.0	3.0	3.0	6.0
SN0031	1.0	1.0	0.0	2.0	1.0	6.0	4.0	1.0	0.0
SN0032	2.0	2.0	1.0	2.0	1.0	8.0	8.0	0.0	4.0
SN0033	2.0	1.0	0.0	1.0	1.0	5.0	5.0	3.0	1.0
SN0034	2.0	4.0	3.0	2.0	2.0	12.0	6.0	0.0	2.0
SN0035	1.0	1.0	1.0	1.0	1.0	7.0	4.0	0.0	2.0
SN0036	1.0	1.0	0.0	1.0	1.0	4.0	4.0	5.0	2.0
Average	1.0	2.0	1.0	1.0	2.0	7.0	5.0	2.0	2.0

Farm number	Fuel and oil	Pasture improvement/cropping	Other feed costs	Fodder purchases	Grain/concentrates/other	Agistment costs	Feed and water inventory change	Total feed costs	Total variable costs
	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs
SN0002	2.0	2.0	0.0	14.0	40.0	0.0	-5.0	58.0	66.0
SN0006	2.0	3.0	0.0	14.0	28.0	2.0	4.0	59.0	66.0
SN0009	3.0	2.0	0.0	23.0	36.0	0.0	-1.0	65.0	70.0
SN0014	1.0	4.0	0.0	16.0	24.0	2.0	-3.0	59.0	67.0
SN0021	2.0	5.0	0.0	0.0	31.0	1.0	4.0	63.0	68.0
SN0022	2.0	5.0	1.0	4.0	36.0	0.0	-1.0	56.0	62.0
SN0023	1.0	7.0	0.0	7.0	26.0	6.0	0.0	65.0	70.0
SN0024	1.0	5.0	0.0	6.0	39.0	2.0	1.0	60.0	68.0
SN0026	3.0	3.0	0.0	21.0	32.0	1.0	-1.0	58.0	65.0
SN0028	2.0	4.0	0.0	23.0	29.0	1.0	1.0	72.0	77.0
SN0029	2.0	3.0	0.0	0.0	41.0	0.0	-12.0	48.0	57.0
SN0031	1.0	5.0	0.0	38.0	22.0	0.0	-8.0	64.0	70.0
SN0032	2.0	4.0	0.0	4.0	23.0	0.0	1.0	45.0	54.0
SN0033	4.0	4.0	0.0	8.0	31.0	0.0	2.0	59.0	64.0
SN0034	1.0	2.0	1.0	12.0	32.0	0.0	-3.0	54.0	66.0
SN0035	1.0	3.0	0.0	5.0	43.0	0.0	-1.0	57.0	64.0
SN0036	1.0	2.0	0.0	7.0	24.0	4.0	13.0	62.0	66.0
Average	2.0	4.0	0.0	12.0	32.0	1.0	-1.0	59.0	66.0

Table C7 Overhead costs – percentage

Farm number	Rates	Farm insurance	Motor vehicle expenses	Repairs and maintenance	Other	Employed labour	Total cash	Depreciation	Imputed owner/operator and family labour	Total
	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs
SN0002	1.0	1.0	0.0	4.0	1.0	12.0	19.0	6.0	9.0	34.0
SN0006	0.0	2.0	1.0	2.0	1.0	16.0	23.0	6.0	5.0	34.0
SN0009	1.0	0.0	1.0	5.0	2.0	8.0	16.0	3.0	10.0	30.0
SN0014	0.0	1.0	1.0	6.0	2.0	9.0	19.0	5.0	8.0	33.0
SN0021	0.0	1.0	0.0	11.0	1.0	11.0	24.0	4.0	4.0	32.0
SN0022	1.0	1.0	1.0	7.0	2.0	16.0	27.0	5.0	6.0	38.0
SN0023	0.0	1.0	1.0	4.0	1.0	2.0	10.0	1.0	19.0	30.0
SN0024	2.0	1.0	1.0	3.0	2.0	9.0	18.0	5.0	10.0	32.0
SN0026	0.0	2.0	0.0	4.0	1.0	10.0	18.0	8.0	9.0	35.0
SN0028	0.0	1.0	0.0	5.0	1.0	13.0	19.0	3.0	1.0	23.0
SN0029	0.0	1.0	0.0	8.0	2.0	21.0	32.0	6.0	4.0	43.0
SN0031	0.0	1.0	0.0	4.0	1.0	9.0	16.0	4.0	11.0	30.0
SN0032	1.0	2.0	1.0	10.0	1.0	26.0	41.0	5.0	0.0	46.0
SN0033	0.0	5.0	0.0	1.0	2.0	14.0	22.0	4.0	9.0	36.0
SN0034	0.0	0.0	1.0	4.0	2.0	18.0	27.0	3.0	4.0	34.0
SN0035	0.0	0.0	0.0	3.0	3.0	29.0	35.0	1.0	0.0	36.0
SN0036	1.0	1.0	0.0	4.0	1.0	14.0	22.0	4.0	8.0	34.0
Average	1.0	1.0	0.0	5.0	2.0	14.0	23.0	4.0	7.0	34.0

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	15,330	12,614	2,732	2,524	1,676	2,762	527	540	20,769	
Liabilities				Equity						
Liabilities per usable hectare		Liabilities per milking cow		Equity per usable hectare			Average equity			
\$/ha		\$/cow		\$/ha			%			
Average		7,440		6,201		13,330			66	

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)
2013/14	7.12	7.85	7.98	8.80	0.32	0.35	0.21	0.23	3.20	3.53	3.73	4.11
2014/15	7.28	7.85	8.25	8.90	0.30	0.32	0.21	0.23	3.28	3.54	3.79	4.09
2015/16	6.97	7.42	7.94	8.45	0.35	0.38	0.21	0.23	3.01	3.20	3.57	3.80
2016/17	6.48	6.77	7.62	7.96	0.40	0.42	0.22	0.23	3.07	3.21	3.68	3.84
2017/18	6.81	6.98	7.49	7.68	0.34	0.35	0.23	0.23	3.63	3.72	4.20	4.31
2018/19	7.37	7.46	8.14	8.25	0.30	0.30	0.26	0.26	4.54	4.60	5.10	5.16
2019/20	8.36	8.36	9.32	9.32	0.31	0.31	0.24	0.24	4.67	4.67	5.22	5.22
Average		7.47		8.44		0.35		0.24		3.69		4.28

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		Return on total assets	Return on equity		
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)				
2013/14	1.54	1.70	1.16	1.28	2.70	2.98	1.55	1.71	0.61	0.68	0.94	1.03	4.8%	4.7%
2014/15	1.52	1.64	1.02	1.10	2.54	2.74	1.92	2.07	0.56	0.60	1.36	1.47	5.3%	5.7%
2015/16	1.49	1.59	1.17	1.25	2.66	2.83	1.71	1.82	0.55	0.59	1.16	1.23	4.7%	4.7%
2016/17	1.67	1.74	1.16	1.21	2.83	2.96	1.11	1.16	0.51	0.53	0.60	0.63	2.7%	2.1%
2017/18	1.49	1.53	1.22	1.25	2.71	2.78	0.58	0.59	0.58	0.60	0.00	(0.00)	2.1%	0.6%
2018/19	1.55	1.57	1.19	1.20	2.74	2.78	0.31	0.31	0.61	0.62	-0.30	(0.31)	0.3%	-2.1%
2019/20	1.78	1.78	0.89	0.89	2.67	2.67	1.43	1.43	0.68	0.68	0.74	0.74	0.3%	-2.1%
Average		1.64		1.19		2.83		1.33		0.65		0.67	3.2%	2.1%

Note: 'Real' dollar values are the nominal values converted to 2019/20 dollar equivalents by the consumer price index (CPI) to allow for inflation. The gross income in 2019/20 did not include feed inventory changes and changes to the value of carry-over water. These were included in feed costs.

Table C10 Historical data – average farm physical information

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	Concentrate price (Nominal \$/t DM)	Concentrate price (Real \$/t DM)
2013/14	381	139	0.60	350	1.0	541	546	6.2	1.0	54	377	416
2014/15	372	165	0.56	430	1.1	540	597	6.7	1.8	57	389	419
2015/16	379	164	0.57	425	1.1	552	597	6.5	1.9	57	382	407
2016/17	343	153	0.63	396	1.2	520	611	6.5	1.7	57	336	351
2017/18	333	149	0.75	401	1.3	526	665	5.6	1.6	55	398	408
2018/19	390	184	0.80	424	1.2	546	643	5.3	1.6	56	552	559
2019/20	419	181	0.65	463	1.2	555	673	4.8	1.3	57	522	522
Average	366	160	0.63	409	1.19	533	629	6.10	1.44	56	552	421

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

Appendix D Glossary of terms, abbreviations and standard values

All other income	Income to the farm from all sources except milk. Includes livestock trading profit, dividends, interest payments received, and rent from farm cottages.	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.
Appreciation	An increase in the value of an asset in the market place. Often only applicable to land value.	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).
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.	Gross farm income	Farm income including milk sales net of levies and charges, livestock trading profit and other farm income, exclusive of GST.
Cash overheads	All fixed costs that have a cash cost to the business. Includes all overhead costs except imputed labour costs and depreciation.	Gross margin	Gross farm income minus total variable costs.
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; <ul style="list-style-type: none"> • 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 	Herd costs	Cost of artificial insemination (AI) and herd tests, animal health and calf rearing.
Cost structure	Variable costs as a percentage of total costs, where total costs equal variable costs plus overhead costs.	Imputed	An estimated amount, introduced into economic management analysis to allow reasonable comparisons between years and between other businesses.
Debt servicing ratio	Interest and lease costs as a percentage of gross farm income.	Imputed labour cost	An allocated allowance for the cost of owner/operator, family and sharefarmer time in the business, valued at \$32.00 per hour.
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.	Interest and lease costs	Total interest plus total lease costs paid.
Earnings before interest and tax (EBIT)	Gross farm income minus total variable and total overhead costs.	Labour cost	Cost of the labour resource on farm. Includes both imputed and employed labour costs.
Employed labour cost	Cash cost of any paid employee, including on-costs such as superannuation and workcover.	Labour efficiency	FTEs per cow and per kilogram of milk solids sold. Measures of productivity of the total labour resources in the business.
Equity	Total assets minus total liabilities. Equal to the total value of capital invested in the farm business by the owner/operator(s).	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.
Equity %	Total equity as a percentage of the total assets owned. The proportion of the total assets owned by the business.	Liability	Money owed to someone else, e.g. family or a financial institute such as a bank.
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.	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.
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.	Metabolisable energy	Energy available to livestock in feed, expressed in megajoules per kilogram of dry matter (MJ/kg DM).
Finance costs	See interest and lease costs.	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 eg 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. 1mm is equivalent to 4 points or 1/25 of an inch of rainfall
MS	Milk solids (proteins and fats)
N ₂ O	Nitrous oxide gas
Q1	First quartile, i.e. the value of which one quarter, or 25%, of data in that range is <i>less than</i>
Q3	Third quartile, i.e. the value of which one quarter, or 25%, of data in that range is <i>greater than</i>
RoTA	Return on total assets
RoE	Return on equity
t	Tonne = 1,000kg
Top 25%	The state average for the top 25% of farms ranked by return on total assets.

Standard values

Livestock values

The standard values used to estimate the inventory values of livestock were

Category	Opening value (\$/hd)	Closing value (\$/hd)
Mature cows	1,600	1,600
17/18 heifers	1,200	1,600
18/19 heifers	600	1,200
19/20 calves		600
Mature bulls	2,400	2,400

Imputed owner/operator and family labour

In 2019/20 the imputed owner/operator and family labour rate was \$32.00/hr based on a full time equivalent (FTE) working 48 hours/week for 50 weeks of the year. This imputed labour rate equates to \$76,800/FTE per annum.



Dairy Australia Limited ABN 60 105 227 987
Level 3, HWT Tower
40 City Road, Southbank Vic 3006 Australia
T +61 3 9694 3777 F +61 3 9694 3733
E enquiries@dairyaustralia.com.au
dairyaustralia.com.au