

# DAIRY FARM MONITOR PROJECT

NEW SOUTH WALES ANNUAL REPORT 2020/21



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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/dairyfarmmonitor](http://dairyaustralia.com.au/dairyfarmmonitor) and [dpi.nsw.gov.au/animals-and-livestock/dairy/dairy-business-advisory-unit](http://dpi.nsw.gov.au/animals-and-livestock/dairy/dairy-business-advisory-unit)

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# HOW TO READ THIS REPORT

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

This report is presented in the following sections:

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

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

The report presents visual descriptions of the data for the 2020/21 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 ten farms on a state-wide basis, taken by considering all 41 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 22 participating farms in the Northern NSW region are referred to as 'North'.
- The 19 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  $[(\text{new value} - \text{original value}) / \text{original value}]$ . For example 'costs went from \$80/ha to \$120/ha, a 50% increase';  $[(120-80)/80] \times (100/1) = [(40/80) \times 100] = 0.5 \times 100 = 50\%$ , unless otherwise stated.

Any reference to 'last year' refers to the 2019/20 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 2019/20 are in the 2020/21 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 2020/21

The Dairy Farm Monitor Report for 2020/21 includes a couple of minor changes since last year's report.

- The number of farms in the project grew by six to forty-one farms this year, up from thirty-five last year. There was one farm that chose not to participate this year, one farm that re-joined the project and six new farms that joined.
- The standard value for imputed owner operator and family labour stands at \$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.
- A review of regional land values was undertaken and upward adjustments made based on recent market sales in areas where participant farms acquired new land, or according to a percentage increase based on the Valuer General's Land Values Recap, July 2021.
- More information was recorded on the feedbase and feeding system in 2021. The pasture base (percentage of perennial and annual pastures) and the type of feeding system (based on proportion of diet sourced from grazed pasture and where supplements were fed) were included this year.
- Groundwater licences were entered separately in the Dairy Farm Monitor spreadsheet to enable accurate recording of this asset.

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



# SUMMARY

In 2020/21 data collected and analysed from 41 farms across New South Wales revealed that farm business profit increased from \$1.05/kgMS to \$2.07/kgMS, the highest level in the ten years of the project.

Continued competition for milk supply saw milk prices retained at a similar level to the average price in 2019/20 with an increase of \$0.06/kgMS to \$8.94/kgMS. Total feed costs reduced by 18.2% on average, due largely to a 30.2% decrease in purchased feed and agistment costs and a general increase in feed inventory as a result of the return to better seasons throughout the year. Rainfall was above average across all regions of NSW, with many coastal parts of the State being inundated with 1 in 100 year flood waters during the early autumn period. Summer was much milder than it had been in 2019/20 providing good opportunity for pasture growth.

In 2020/21, State milk production stabilised following the impact of several years of drought with 1.075 billion litres produced, maintaining 12.1% of the national production. (Source: Dairy Australia).

For the farmers participating in the Dairy Farm Monitor Project, milk price in 2020/21 remained similar to the previous year, up slightly from \$8.88/kgMS (65.6 cents/litre) to \$8.94/kgMS (66.2 cents/litre).

NSW began the 2020/21 year with 86.9% of the state in one of three drought categories. By the end of the year the NSW Combined Drought Indicator (CDI) showed 94% of NSW was in either the Recovery or Non-Drought category. Only 3 farms out of the 41 received less than their annual average rainfall, with many farms in the coastal regions experiencing extreme rainfall events and severe flooding during early autumn, in some cases with devastating results in terms of loss of pasture, herd health issues and associated production losses. Reports from the Bureau of Meteorology (BOM) stated December 2020 as the third wettest on record which, on the east coast was due to slow moving low pressure systems. Subsequently March 2021 saw double the March average rainfall in NSW and the second wettest March on record for the State.

At the beginning of the financial year many river systems were at critically low flows and irrigation had been curtailed or restricted to ground water only in many

catchments. Total rural storage levels were at 38%. By the end of the year, inflows had increased this level to 78%.

In general, more favourable growing conditions through the year for homegrown crops and pastures saw 57% of feed being consumed from the homegrown feed base across the state, up 6% on the previous year. Conditions also allowed for fodder conservation in many areas with an increase in feed inventory, particularly in the south of the State.

Purchased grain and fodder prices fell with increased availability compared to the previous year. The average cost of concentrates was \$456/tDM, down from \$555/tDM in 2019/20, and the average cost of hay was \$315/tDM down from \$407/tDM.

Average Earnings Before Interest and Tax (EBIT) per farm increased to \$471,437 compared to \$269,897 in 2019/20. This translates to an average EBIT of \$2.07/kgMS (15.3 c/l).

As a result of severe flooding in parts of the State, NSW dairy farmers were able to access support payments from various sources. Those included in this analysis were freight rebates on transport of fodder and access to grants to assist with recovery efforts. Government grants were also received via the small business stimulus package in response to the coronavirus pandemic. Payments continued to be received from major liquid milk retailers from the sales of milk as part of their support from the impacts of drought.

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 challenges of severe wet weather and flooding. Milk prices on average remained stable at \$9.31/kgMS (69.1 c/l) compared to \$9.37/kg MS (68.4 c/l) the year before, and total other farm income increased from \$0.98/kg MS to \$1.32/kgMS, mainly driven by a 64% increase in livestock trading profit.

The average cost of production (including inventory change) was 10.3% lower than the year before, at \$8.81/kg MS (65.4 c/l). This was mainly due to lower purchased feed and agistment costs.





Average whole farm earnings before interest and tax (EBIT) increased to \$273,109 per farm compared to \$141,281 per farm in 2019/20. Average return on total assets increased from 1.7% in 2019/20 to 3.3% in 2020/21.

### The South

Most of the southern region also experienced higher than average rainfall throughout 2020/21. There was a 1.8% increase in milk price on the previous year to \$8.51/kg MS, up from \$8.36/kgMS in 2019/20.

The average cost of production decreased by 12.8% in 2020/21, to \$6.93/kgMS (51.0 c/l),

Overall this led to a large increase in EBIT to an average of \$701,079 per farm this year, up from \$406,083 the previous year. Average return on total assets for the group increased to 6.7%, up from 3.8% in 2019/20.

### Farmer confidence

As 2020/21 was a year of higher profits, expectations about improving business profit remain positive for the coming year in both the northern and southern regions. All participating businesses anticipate returns to 'improve' or 'remain stable'. No-one is expecting declining returns in the 2021/22 financial year. The north have 64% of businesses expecting improved returns and 36% seeing returns as remaining stable. In the south it is 79% and 21% respectively.

In terms of milk production 5% of farmers in the north expect to reduce milk production next year with 64% of northern and 68% of southern farmers expecting to increase production. The remainder of farmers intend to keep production stable. This indicates positivity in the year ahead as farms continue to capitalise on favourable operating 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

An historical analysis over the past ten years of the project showed that 2020/21 saw a continuation to the trend of increasing profit (EBIT per farm) following the 2019/20 performance 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 2020/21 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.

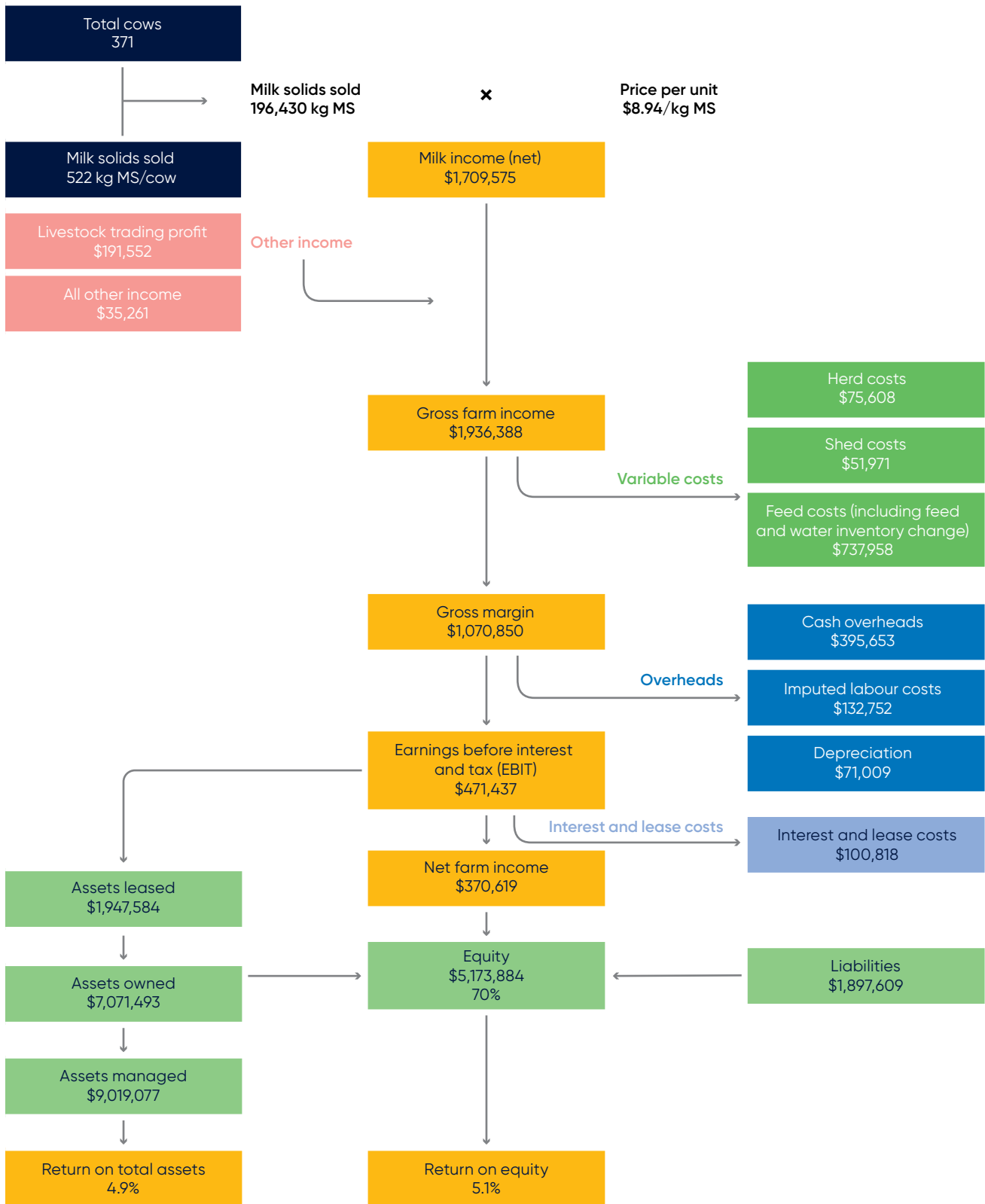
Return on total assets indicates the overall earning of the total farm assets, irrespective of capital structure of the business. It is EBIT expressed as a percentage of the total assets under management in the farm business, including the value of leased assets.

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 2020/21 data, 41 farms





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# 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 12.1% of Australia’s national milk supply, a total of 1.075 billion litres in 2020/21 from 523 dairy farms. 62% of milk produced in NSW was sold as liquid drinking milk, with the remainder processed for domestic and export markets. 12% of milk produced on farm in 2020/21 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 2020/21 across NSW



## 2020/21 Seasonal conditions

NSW began the 2020/21 year with 86.9% of the state in one of three drought categories. By the end of the year the NSW Combined Drought Indicator (CDI) showed 94% of NSW was in either the Recovery or Non-Drought category. Rainfall for the year was, in general, above average across the State.

Wetter conditions at the beginning of the financial year and then through the summer period (particularly for the North) and then heavy falls during autumn in many regions resulted in high soil moisture levels, increases in stream flows and water storage levels.

The summer and autumn rainfall events saw many of the coastal regions experience severe flooding, with devastating impacts in terms of loss of farm infrastructure (eg. laneways and fencing), loss of pasture and herd health impacts, particularly lameness and mastitis.

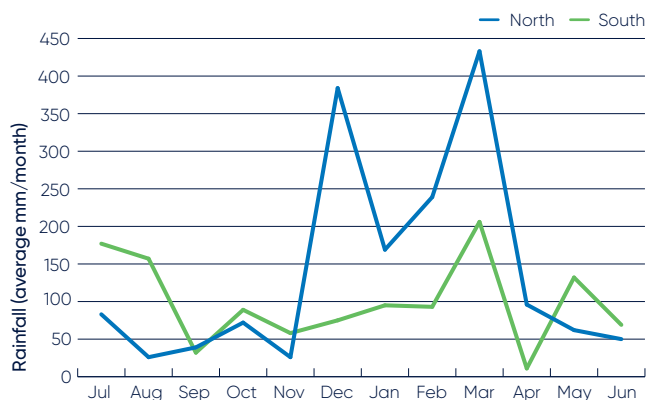
The wetter year did enable some good pasture responses and provided opportunity for sowing and pasture renovation as well as fodder conservation in many areas.

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.

Summer saw predominantly cooler daily temperatures for most of the State.

The regional sections provide more detail on the 2020/21 seasonal conditions. Figure 3 shows the average monthly rainfall pattern in 2020/21 for the participating farms, and the similarities across the state.

**Figure 3** 2020/21 monthly rainfall



# WHOLE FARM ANALYSIS

2020/21 was a positive year for the majority of participant farms in NSW due to milder seasonal conditions, moist soil profiles, the availability of irrigation water and relatively good terms of trade.

Milk prices remained strong with continued competition for supply across the State. However extreme rainfall events resulting in severe flooding impacted a number of businesses, particularly in the coastal region of the north. Profitability continued its positive trend on the 2019/20 performance to the highest level in the 10 years of DFMP in NSW.

There were six new farms in the project this year (four in the North and two in the South), one farm that returned to the project and one who chose not to participate, to increase the sample size to 41 farms (22 in the North and 19 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 remained the same as 2019/20 in the northern group at 309 cows while decreasing in the southern group to an average of 442 cows. This was influenced by the change in sample farms.

The average rainfall across the dataset was higher than the previous year, with all farms except three in the south receiving above average annual rainfall.

Milk solids (MS) sold per cow were higher across both regions with the north up marginally (2 kgMS to 474 kgs per cow and the south up 23 kg to 578 kgs per cow).

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

The percentage of home grown feed in the diet increased across the State from 51% last year to 57% this year, with farms in the North increasing from 55% to 62% and farms in the South increasing from 47% to 52% 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.

**Table 1** Farm physical data – state overview

Farm physical parameters	State	North	South
Number of farms in sample	41	22	19
Annual rainfall 2020/21 (mm)	1,453	1,679	1,192
Herd size	371	309	442
Total water use efficiency (t DM/100mm/ha)	0.5	0.4	0.6
Total usable area (ha)	365	321	416
Milking cows per usable hectares	1.3	1.3	1.3
Milk sold (kg MS/cow)	522	474	578
Milk sold (kg MS/ha)	649	596	710
Home grown feed as a % of ME consumed	57%	62%	52%
Labour efficiency (cows/FTE)	74	67	83
Labour efficiency (kg MS/FTE)	38,438	31,372	46,621



## 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 remained relatively stable this year. The average milk price across all participants was \$8.94/kgMS (66.2 cents/litre) up from \$8.88/kg MS (65.6 cents/litre) last year. Average milk price in the North this year was \$9.31/kg MS (69.1 c/l) and in the South it was \$8.51/kg MS (62.8 c/l).

Milk income accounted for 88% of gross farm income, with income from livestock trading profit higher at \$1.00/kgMS compared to \$0.76/kg MS in the previous year. Other income was similar to last year at \$0.19/kgMS (1.4 c/l) compared to \$0.20/kg MS (1.5c/l), and includes such things as fodder sales, farm house rental and 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 \$2.61/kgMS (19.3 c/L) which is 30% lower than the previous year of \$3.74/kg MS (27.5 c/l). This sees a significant turnaround from the previous year where drought was impacting the availability of purchased feed, driving up its cost. There was also less purchased feed needed in the diet due to better seasonal conditions and therefore more homegrown feed in the diet. Home grown feed costs were 7.6% higher this year at \$1.42/kgMS, up from \$1.32/kgMS.

Total feed costs, including home grown feed, purchased feed and agistment and feed and water inventory change, were down 18.2% to \$3.92/kgMS compared to \$4.79/kgMS the previous year, and accounted for 48.6% of total costs (variable plus overhead costs) on average for the state.

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 \$5.49/kgMS which was higher than the previous year of \$4.40/kgMS.

**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
<b>Income</b>						
Milk income (net)	8.94	66.2	9.31	69.1	8.51	62.8
Livestock trading profit	1.00	7.3	1.13	8.3	0.84	6.2
Other farm income	0.19	1.4	0.19	1.4	0.19	1.4
<b>Total income</b>	<b>10.12</b>	<b>74.9</b>	<b>10.63</b>	<b>78.8</b>	<b>9.53</b>	<b>70.4</b>
<b>Variable costs</b>						
Herd cost	0.42	3.1	0.50	3.7	0.33	2.5
Shed cost	0.29	2.1	0.33	2.4	0.24	1.8
Home grown feed cost	1.42	10.6	1.57	11.7	1.25	9.4
Purchased feed and agistment	2.61	19.3	2.67	19.8	2.53	18.6
Feed inventory change	-0.10	-0.8	0.08	0.6	-0.32	-2.5
Water inventory change	0.00	0.0	0.00	0.0	0.00	0.0
Total feed costs	3.92	29.1	4.33	32.2	3.46	25.5
<b>Total variable costs</b>	<b>4.63</b>	<b>34.3</b>	<b>5.15</b>	<b>38.3</b>	<b>4.03</b>	<b>29.7</b>
<b>Gross margin</b>	<b>5.49</b>	<b>40.6</b>	<b>5.48</b>	<b>40.5</b>	<b>5.50</b>	<b>40.7</b>
<b>Overhead costs</b>						
Employed labour	1.11	8.2	1.17	8.6	1.05	7.7
Repairs and maintenance	0.53	3.9	0.59	4.4	0.46	3.4
All other overheads	0.41	3.1	0.49	3.6	0.33	2.4
Imputed labour	0.97	7.2	1.24	9.2	0.67	4.9
Depreciation	0.40	3.0	0.42	3.1	0.38	2.8
<b>Total overhead costs</b>	<b>3.43</b>	<b>25.3</b>	<b>3.90</b>	<b>28.8</b>	<b>2.88</b>	<b>21.2</b>
<b>Variable and overhead costs</b>	<b>8.06</b>	<b>59.6</b>	<b>9.05</b>	<b>67.1</b>	<b>6.91</b>	<b>50.9</b>
<b>Earnings before interest and tax</b>	<b>2.07</b>	<b>15.3</b>	<b>1.59</b>	<b>11.7</b>	<b>2.62</b>	<b>19.4</b>

## 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 slightly higher than last year, at \$3.43/kgMS (25.3 c/l) up from \$3.35/kgMS (24.7 c/l).

Table 2 shows that in 2020/21 the North had higher average variable costs and 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 \$2.07/kgMS (15.3 c/l) compared to \$1.05/kg MS (7.9 c/l) in 2019/20. On a dollars per farm basis EBIT was higher this year, at an average of \$471,437 per farm compared to \$269,897 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 \$0.69/kg MS to \$1.59/kgMS and the participants in the South having an increase from \$1.43/kg MS to \$2.62/kgMS.

This much improved EBIT across the regions, was driven primarily by an 18.2% decrease in total feed costs (down \$0.87/kgMS) and a 31.6% increase in livestock trading profit (up \$0.24/kgMS). The Emergency Relief packages including the Transport Subsidies (for fodder, water and other production inputs) and Disaster Recovery Grants provided valuable financial support assisting to reduce the impacts of many impacted by the severe flooding events during March 2021.

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 2020/21. The RoTA was 4.9%, up from 2.7% last year.

Figure 5 shows the majority of farms had a RoTA between 0% and 10%. The participant farms ranged from negative 1.5% up to 14%, with 37 of the 41 farms recording a positive RoTA.

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

The average RoE for the 41 farms was 5.1%, an increase from 4.7% RoE received by participants last year. The range in RoE for the State was negative 70.6% to 35% this year, with 33 of the 41 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 A1 for the state and in Appendix Tables, B1 and C1 for each region presents RoTA and RoE for the participant farms.

Figure 4 Average earnings before interest and tax

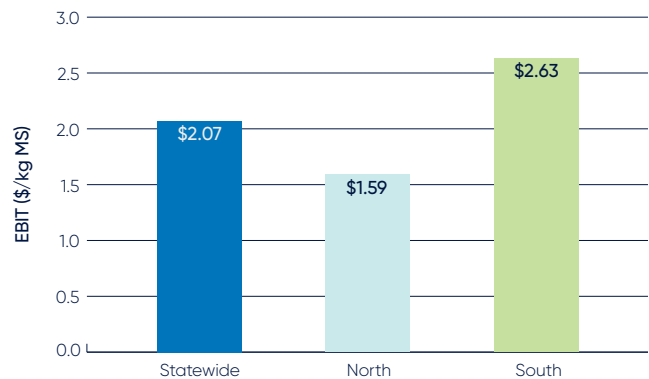


Figure 5 Distribution of farms by return on total assets

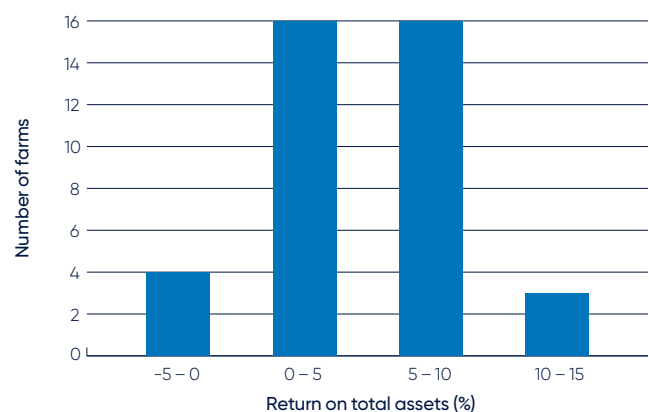
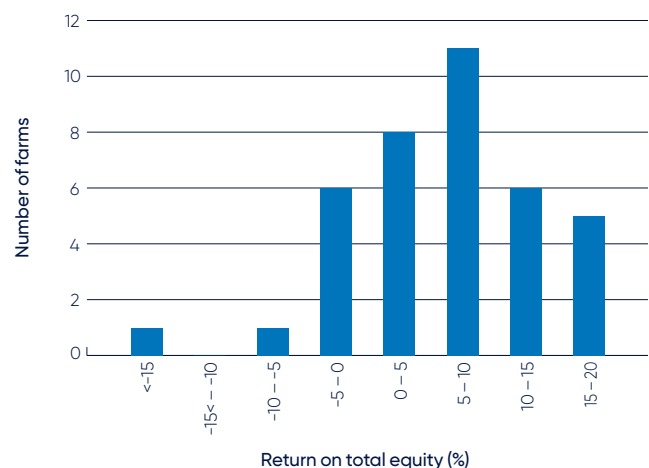


Figure 6 Distribution of farms by return on equity





## 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.”<sup>1</sup>*

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, \$0.58 was used to cover variable costs, \$0.04 lower than 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 average across the State. This was a result of an increase in debt per cow in the North of \$367, to \$4,759 while there was a decrease in debt per cow of \$131 in the South.

It should be noted that this will be impacted by the addition of new businesses into the dataset.

This year there was a decrease in average equity levels across the state, with an average of 70% compared to 73% last year. Caution should be exercised when comparing equity between years as the farm sample changes, as mentioned earlier.

Also of note is the decrease in reliance on the percentage of imported feed in the diet, down to 43% from 49% the previous year across the state.

**Table 3** Risk indicators – statewide and by region

	State average	North	South
Cost structure (percentage of total costs as variable costs)	58	57	58
Debt service ratio (percentage of income as finance costs)	6	5	6
Debt per cow	\$5,367	\$4,759	\$6,070
Equity percentage (ownership of total assets managed)	70	71	69
Percentage of feed imported (as a percentage of total ME)	43	38	48

<sup>1</sup> 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 50% of the diet for cows and concentrates 32%. This represents 5% more pasture and 2% less concentrate than the previous year.

On the South pasture made up 33% of the diet, with 38% of the diet coming from concentrates. South farms sourced 20% of the diet from hay and silage, whilst North farms sourced 11% of ME from hay and silage.

These figures indicate that directly grazed pasture made up more of the cows diet in the North farms, with the shortfall in ME in the South farms mainly sourced from conserved or purchased fodder and 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.

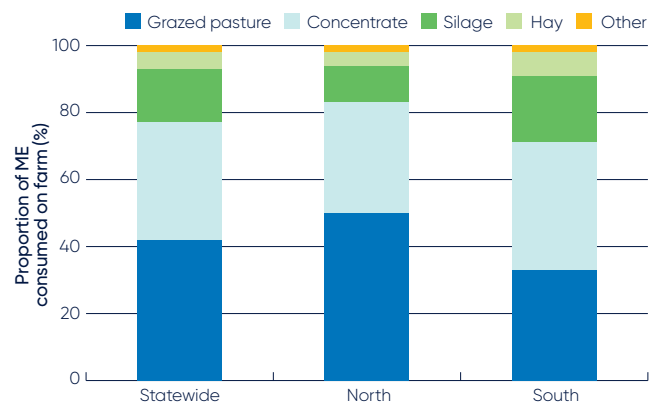
Total home grown feed consumed on the milking area (by direct grazing plus conservation) in 2020/21 was up relative to the previous year across both regions.

The North directly grazed 6.6 t DM/ha, and conserved 1.6 t DM/ha, for a total of 8.2 t DM/ha, up by 0.7 tDM/ha. The South consumed an average of 5.1 t DM/ha of direct

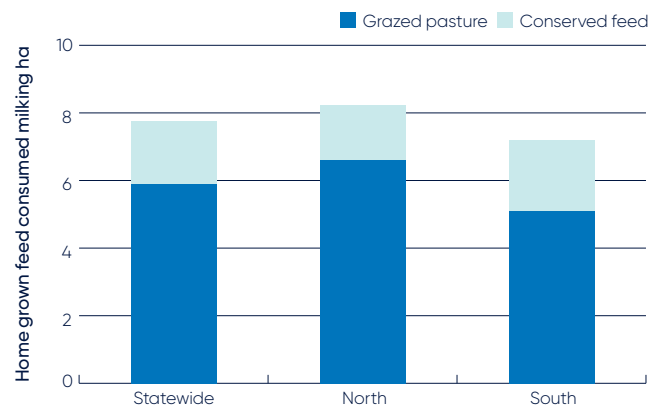
grazed pasture and conserved 2.1 t DM/ha, for a total of 7.2 t DM/ha, up by 1.4 tDM/ha.

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 reported for the milking area rather than for the whole usable area of each farm.

Across the state, the total application of nutrients on the milking area was 312.3 kg/ha. This comprised of nitrogen (229.7 kg/ha), phosphorus (19.2 kg/ha), potassium (37.5 kg/ha) and sulphur 25.9 kg/ha). There were significant difference between the regions. Average fertiliser usage on the milking areas for the North was: nitrogen at 286.1 kg/ha, phosphorus 23.9 kg/ha, potassium at 54.5 kg/ha, and sulphur at 38.7 kg/ha. For the South it was: nitrogen at 164.3 kg/ha, phosphorus at 13.8 kg/ha, potassium at 17.7 kg/ha and sulphur at 11 kg/ha.

Nutrient application rates that were higher in the north this year were impacted by the severe flooding event in autumn. Flooding resulted in severe nutrient depletion, particularly of nitrogen. Given the timing of the floods, there was still opportunity to re-apply nitrogen to pastures in order to build up a good body of homegrown feed cost effectively.

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 2020/21 had a drop in production in autumn relative to the South. In Autumn there is normally a continued upward trend to milk production in the North from February through to April. This year saw a slight dip from March to April with the flooding impacting herd health in many herds (eg. lameness and mastitis) and pasture availability/quality on some farms and consequently milk production.

## 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

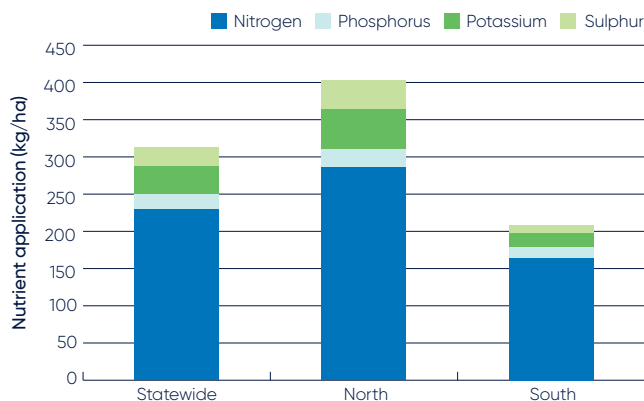


Figure 10 Monthly distribution of milk solids sold

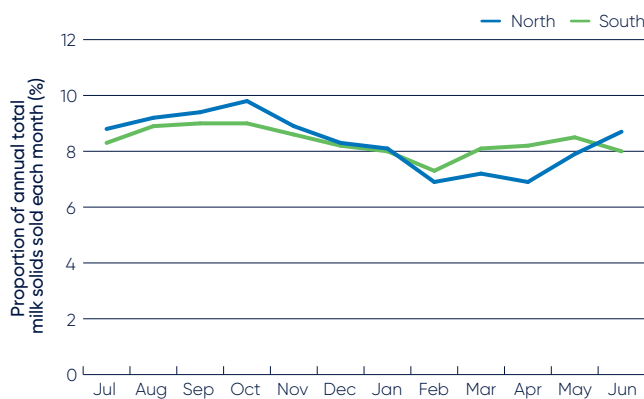
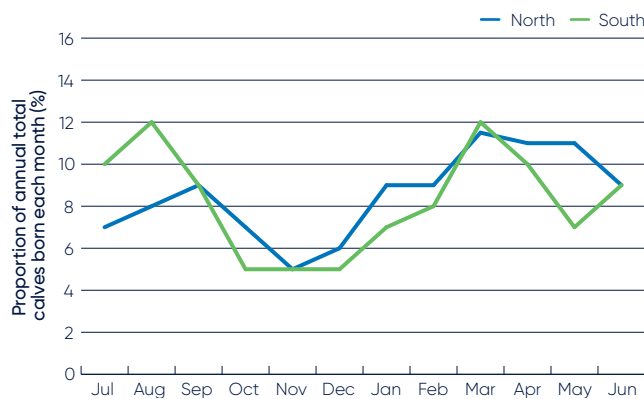


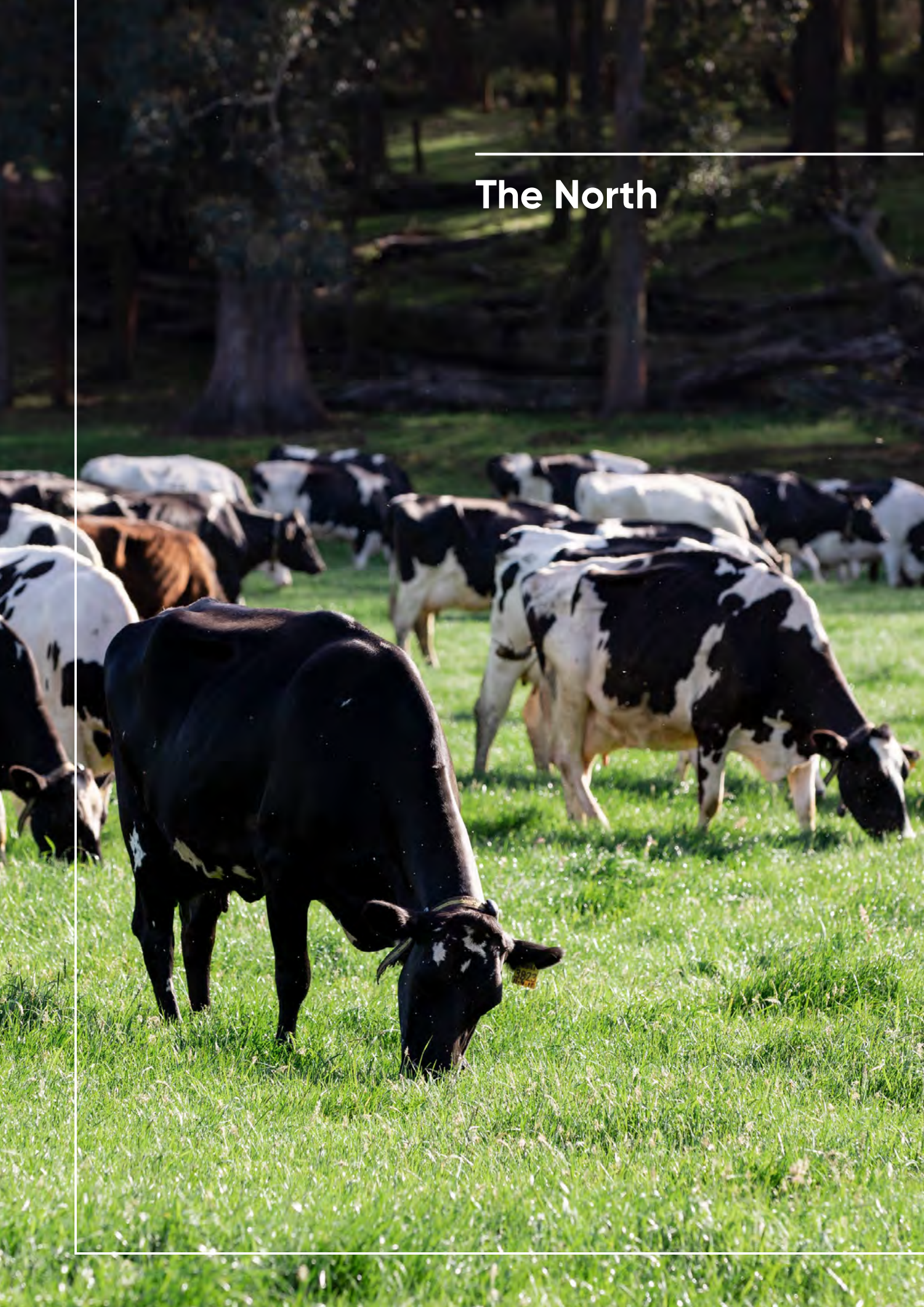
Figure 11 Monthly distribution of calves born





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# The North



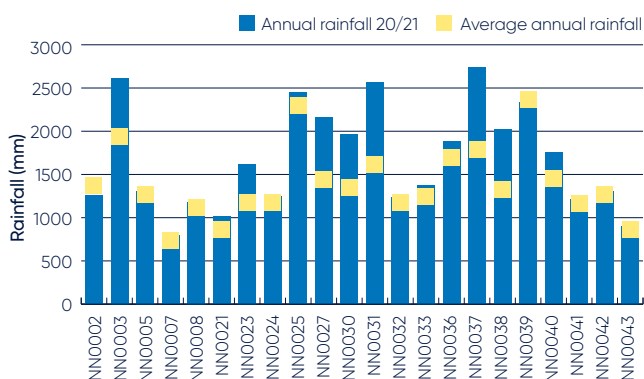


There were four new farms in the North dataset this year and all 18 from 2019/20 continued in the project.

## 2020/21 Seasonal conditions

The first half of 2020/21 saw relatively mild conditions throughout northern NSW, with intermittent short dry periods. Summer saw some intense rainfall events during December which then resulted in devastating flooding during March in many of the coastal areas, due to an already saturated soil profile. Some, but not all farms had commenced Autumn sowing just prior to the floods, resulting in resowing of ryegrass pastures or renovation of existing pastures. This also resulted in some farms having to utilise fodder inventory earlier in the season than normal, and more of it, in the case of farms that were inundated with water.

**Figure 12** Annual rainfall and long term average rainfall



## Whole farm analysis

Participant dairy farmers in the North received an average milk price of \$9.31/kgMS sold, slightly lower than \$9.37/kg in the previous year.

Average herd size for the North farms remained the same at 309 cows, with milk solids production per cow increasing slightly (+2kgMS/cow) and milk solids per hectare increasing by 17kgMS/ha to 596kgMS/ha. The average home grown feed as a percentage of ME consumed was much higher at 62% compared to 55% in the previous drought affected year. Stocking rate was also slightly higher at 1.3 cows/usable hectare.

Grain and fodder prices fell from the highs of 2019/20 with purchased fodder much more accessible, if needed. Many farms had increased their fodder inventory in the second half of the previous financial year, however challenges and timing of severe flooding in Autumn meant that much of this was utilised and compared to the previous year there was less fodder stored on farm by the end of the financial year.

Labour efficiency was slightly better than the previous year in the North, up to an average of 67 cows/FTE compared to 65 cows/FTE the previous year (31,372 kgMS/FTE compared to 30,408 kgMS/FTE). This is still behind where efficiency was in 2018/19 at 72 cows/FTE.

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.

**Table 4** Farm physical data – North

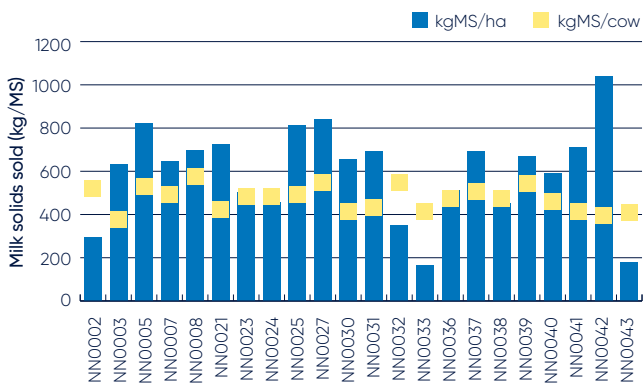
Farm physical parameters	North average	Q1 to Q3 range	Top 25% average
Annual rainfall 2020/21 (mm)	1,679	1,241–2,127	1,078
Herd size	309	184–363	384
Total water use efficiency (t DM/100mm/ha)	0.4	0.3–0.5	0.7
Total usable area (hectares)	321	146–268	381
Milking cows per usable hectares	1.3	1.0–1.6	1.1
Milk sold (kg MS/cow)	474	417–517	621
Milk sold (kg MS/ha)	596	466–706	662
Home grown feed as percentage of ME consumed	62%	58%–67%	54%
Labour efficiency (cows/FTE)	67	56–76	76
Labour efficiency (kg MS/FTE)	31,372	26,151–35,670	46,320

## Milk solids sold

Average milk solids sold per hectare increased compared to last year at 596kg MS/ha (8,017 litres/ha). Average milk solids sold per cow were up on last year to 474 kgMS/cow (6,419 l/cow) compared to 472 kg MS/cow (6,483 l/cow).

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

**Figure 13** Milk solids sold per hectare and per cow



## 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 \$10.63/kg MS included milk income of \$9.31/kg MS (69.1 c/l) plus all other income associated with the dairy business operation of \$1.32/kgMS (9.7 c/l).

This year's average gross farm income was 2.7% higher than last year's average. The milk price received was relatively steady, increasing by only \$0.06/kgMS.

Livestock trading profit contributed \$1.13/kgMS (8.3 c/l) towards gross income and other farm income decreased by 34% to \$0.19/kgMS (1.4 c/l). Other farm

income includes 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.

## 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 \$5.15/kgMS (38.3 c/l) with 50% of farms sitting in a range of \$4.60/kgMS to \$5.69/kgMS. This is 8.8% lower than in 2019/20 due largely to a decrease in purchased feed and agistment costs. Herd costs were up \$0.07/kgMS on 2019/20 to \$0.50/kgMS while shed costs were only slightly up on last year at \$0.33/kg MS, from \$0.32/kgMS.

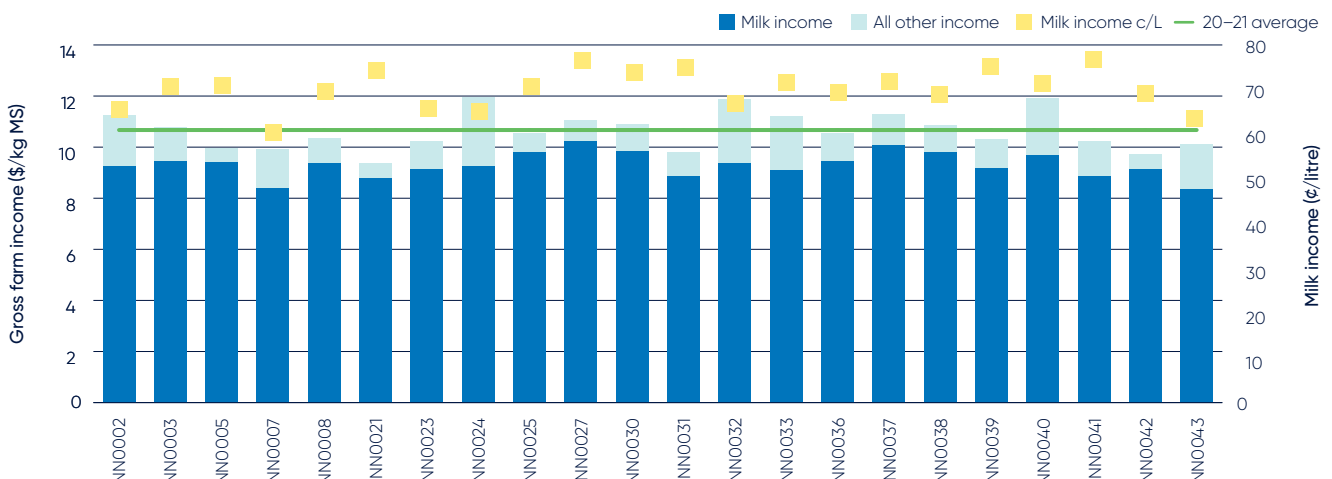
Feed costs were the most significant variable cost items, accounting for 48% of the average total costs in 2020/21. The average feed cost was \$4.33/kg MS, which is 12% lower than last year's cost of \$4.91/kg MS. On average, feed inventory changed by positive \$0.08/kg MS as farmers drew down on their feed reserves towards the end of the year, in many cases due to flooding impacts.

The average cost of home-grown feed was higher than the previous year at \$1.57/kgMS, affected mainly by more pasture and cropping costs and fertiliser costs.

Purchased feed and agistment costs were \$2.67/kg MS, 31.5% lower than the previous year at \$3.90/kg MS.

The average cost of concentrates in the North this year was \$497/t DM (\$447/t as fed), down from \$586/t DM (\$527/t as fed) last year. The cost of concentrate includes the cost of additives and minerals. North farmers fed an average of 1.9t DM/head concentrates to the milkers, although this figure includes concentrates fed to young stock on the milking area.

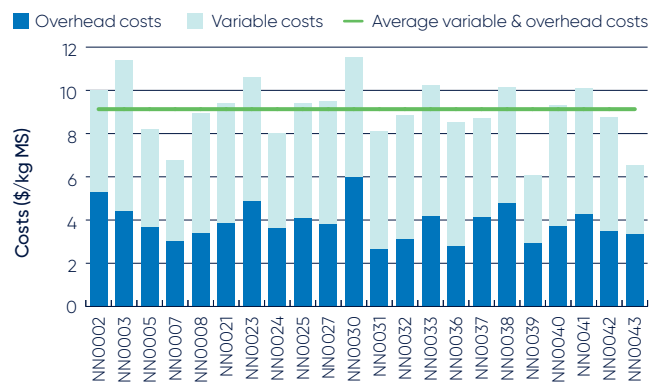
**Figure 14** Gross farm income per kilogram of milk solids



The cost of purchased hay fell from the previous highs of 2019/20 to average \$328/tDM (\$279/t as fed) down from \$465/ t DM (\$395/t as fed).

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.

**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
<b>Income</b>					
Milk income (net)	9.31	69.1	9.12–9.62	8.49	62.6
Livestock trading profit	1.13	8.3	0.71–1.5	0.99	7.3
Other farm income	0.19	1.4	0.05–0.29	0.00	1.7
<b>Total income</b>	<b>10.63</b>	<b>78.8</b>	<b>10.12–11.17</b>	<b>10.07</b>	<b>71.6</b>
<b>Variable costs</b>					
Herd cost	0.50	3.7	0.38–0.56	0.33	2.5
Shed cost	0.33	2.4	0.24–0.36	0.26	1.9
Home grown feed cost	1.57	11.7	1.14–1.78	1.33	9.8
Purchased feed and agistment	2.67	19.8	2.36–3.09	2.34	17.3
Feed inventory change	0.08	0.6	-0.07–0.35	-0.55	-4.1
Water inventory change	0.00	0.0	0–0	0.01	0.0
Total feed costs	4.33	32.2	3.93–4.83	3.13	23.1
Total variable costs	5.15	38.3	4.6–5.69	3.72	27.4
<b>Gross margin</b>	<b>5.48</b>	<b>40.5</b>	<b>4.6–6.22</b>	<b>6.00</b>	<b>44.2</b>
<b>Overhead costs</b>					
Employed labour	1.17	8.6	0.7–1.61	0.92	6.6
Repairs and maintenance	0.59	4.4	0.45–0.69	0.46	3.4
All other overheads	0.49	3.6	0.37–0.6	0.30	2.2
Imputed labour	1.24	9.2	0.73–1.81	0.78	5.8
Depreciation	0.42	3.1	0.29–0.51	0.35	2.6
Total overhead costs	3.90	28.8	3.38–4.25	2.82	20.7
<b>Variable and overhead costs</b>	<b>9.05</b>	<b>67.1</b>	<b>8.29–10.05</b>	<b>6.54</b>	<b>48.1</b>
<b>Earnings before interest and tax</b>	<b>1.59</b>	<b>11.7</b>	<b>0.78–2.53</b>	<b>3.18</b>	<b>23.5</b>

## 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 2020/21 at \$3.90/kg MS (28.8 c/l) were lower than the previous year.

The overhead costs this year ranged from \$2.68/kg MS to \$5.99/kg MS (shown as blue bars in Figure 15).

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

The main overhead cost category is labour, both employed and imputed, which account for 61.8% of total overhead costs. This year total labour costs were lower 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 decreased this year to \$8.81/kg MS (65.4 c/l) from \$9.82/kg MS (71.3 c/l) in 2019/20.

The decrease in cost of production was largely due to lower purchased feed costs with a slight decrease in total labour costs and a negative livestock inventory change (indicating more stock on hand by the end of the year).

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

**Table 6** Cost of production

Farm costs	North average		Q1 to Q3 range	State top 25% average	
	\$ kg/MS	c/l		\$ kg/MS	\$ kg/MS
Cash cost of production	7.31	54.2	6.6–7.95	5.95	43.7
Cost of production (excluding inventory changes)	8.96	66.5	8.46–9.69	7.08	52.1
<b>Inventory change</b>					
+/- feed and water inventory changes	0.08	0.6	-0.07–0.35	-0.54	-4.0
+/- livestock inventory changes minus purchases	-0.24	-1.7	-0.51–0.02	-0.06	-0.5
Cost of production (including inventory changes)	8.81	65.4	8.22–9.7	6.48	47.6

## Earnings before interest and tax

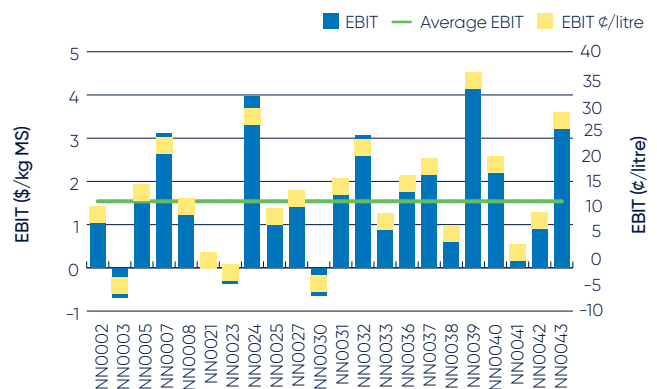
Earnings before interest and tax (EBIT) is gross farm income less variable and overhead costs (cash and non-cash).

The average EBIT across North farms this year increased to \$1.59/kg MS (11.7 c/l) compared to \$0.69/kg MS (5.5 c/l) last year. This was due to a number of factors including milk price remaining strong and livestock trading profit increasing. Meanwhile purchased feed and agistment costs reduced dramatically from the highs of 2019/20 due to a much better year for homegrown feed and the availability of purchased feed reducing cost, although there was a draw down on fodder inventory which adds to total feed costs. There was also a slight reduction in total labour costs.

Figure 16 shows a wide range in EBIT across the North farms, from negative \$0.68/kg MS to \$4.26/kg MS sold. Eighteen 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 \$3.18/kg MS (23.5 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.

**Figure 16** Whole farm EBIT per kilogram of milk solids





## 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.

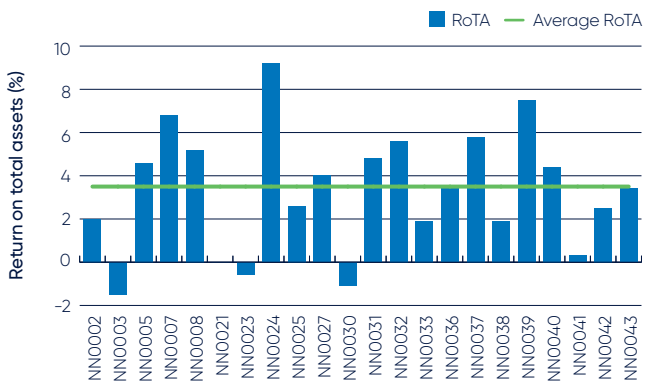
The average return on total assets for participant farms this year was 3.3% up from 1.7%, the previous year. The range across the group was -1.5% to 9.2%.

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.

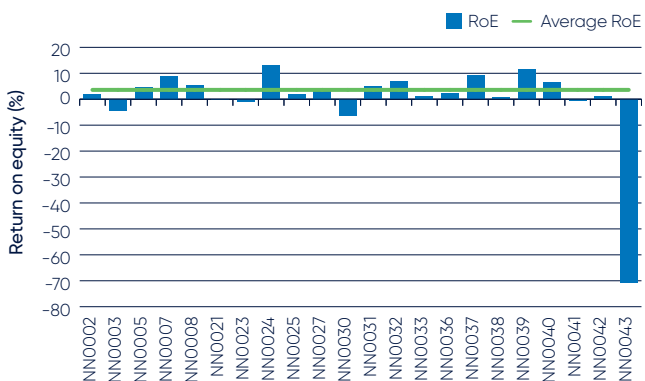
The average RoE was 0.0%, down from 0.9% recorded last year. There was a wide range of return on equity reflecting the various capital structures of businesses in Northern NSW. Six farms recorded a negative RoE as shown in Figure 18.

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

**Figure 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 higher than the previous year due to improved seasonal conditions.

## Feed consumption

The relative contribution of each feed type to the metabolisable energy (ME) consumption on each farm is shown in Figure 19. The broad range of different sources of ME used on individual farms is evident.

Grazed pasture supplied 50% or more of ME consumed on 11 of the 22 farms this year, with the average being 50%, and the range was between 31% and 77%. The portion of the ME consumed derived from concentrates was slightly lower this year at an average of 32%. All participant farms except one fed silage as part of their ME consumed with 32% of the diet coming from this source on one farm, and an average of 11% of the diet, similar to last year. Hay accounted for 4% of ME consumed on average, lower than the year before.

The "Other" feed category includes feeds such as brewer's grain, palm kernel meal and various bi-products.

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 8.2 t DM/ha, which was higher than the previous year of 7.5 t DM/ha. This included an average of 6.6 t DM/ha directly grazed and 1.6 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.

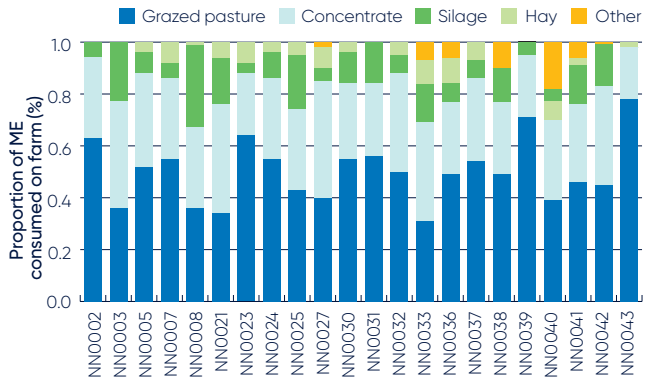
## Fertiliser application

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.

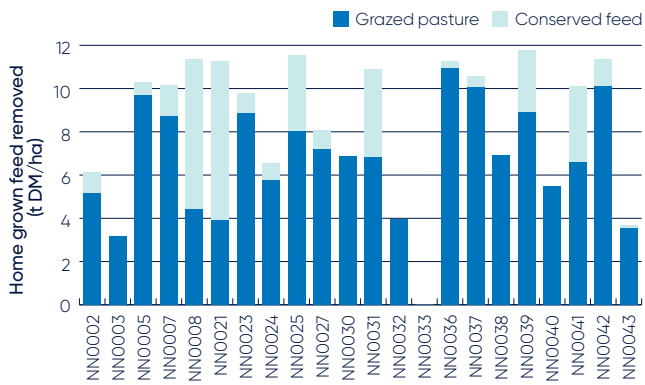
The average fertiliser application was 403.2 kgs nutrient/milking hectare. Farms in the North applied slightly higher levels of nitrogen, potassium and sulphur per hectare in 2020/21 compared to the previous year (Figure 21), with phosphorus levels slightly lower. Higher nutrient application levels were seen on a number of farms due to strategic decisions to apply fertiliser after the severe flooding. This was to restore levels for recovery and quick dry matter production.

Average nitrogen use was 286 kg/ha, phosphorus 23.9kg/ha, potassium 54.5 kg/ha and sulphur 38.7 kg/ha this year.

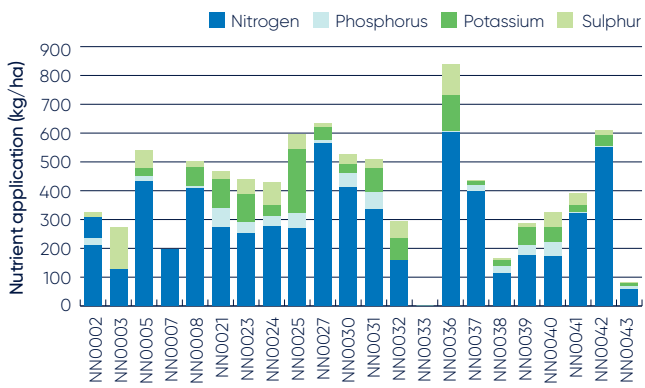
**Figure 19** Sources of whole farm metabolisable energy



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



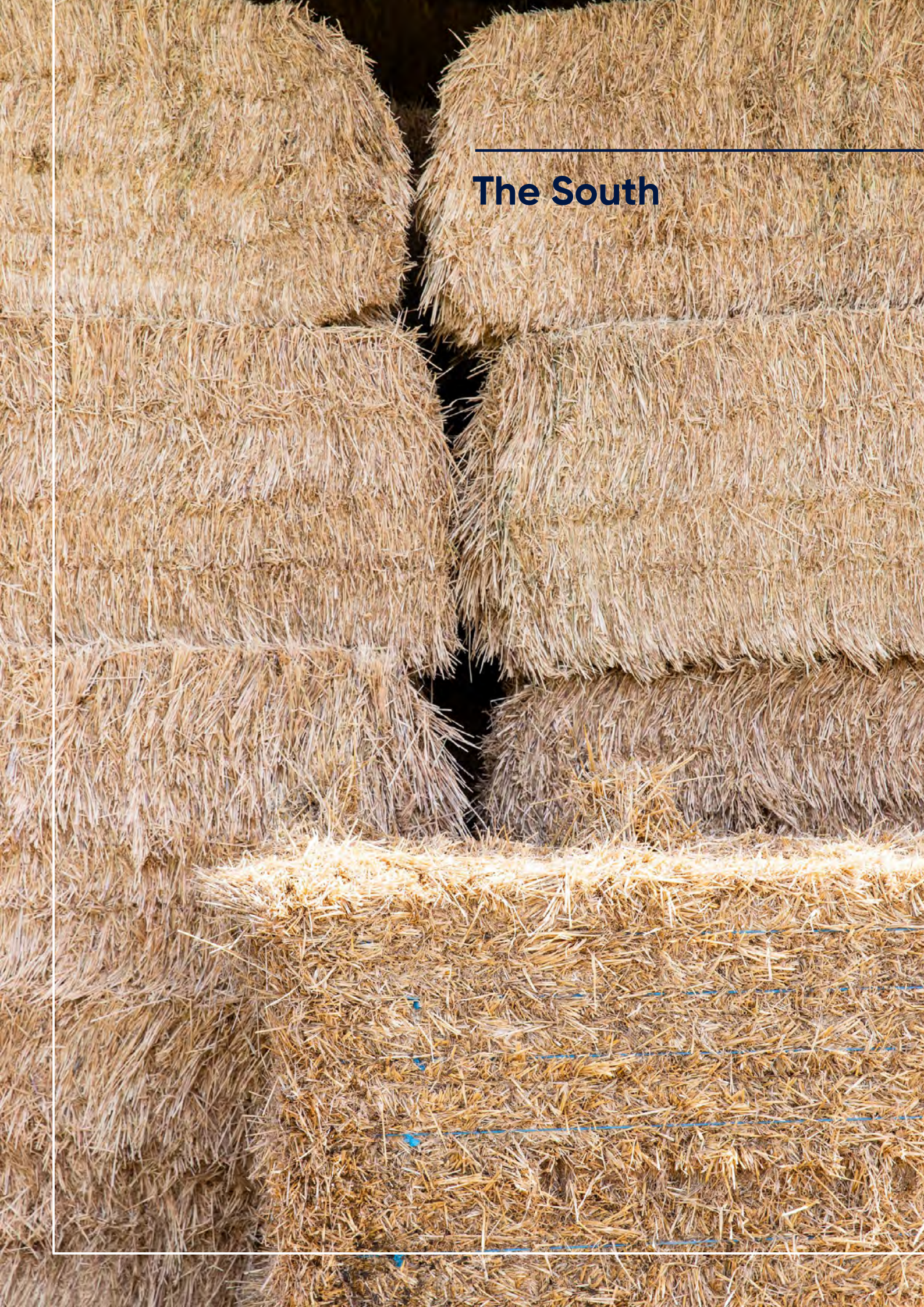
**Figure 21** Nutrient application per milking area





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# The South





There were two new farms in the South dataset this year, one that returned to the project and one farm from last year did not participate.

## Seasonal conditions

Southern NSW covers a large area (Murray, Riverina, Far South Coast, South Coast and Central Inland areas) which often experience very different seasonal conditions. On the whole, the 2020/21 year was a very good year, with most areas receiving above average annual rainfall. The Far South Coast region continued to receive good follow up rain at the beginning of the year with excellent opportunities for pasture growth and fodder conservation. This was similar in the Murray (enabling good winter and spring conditions for dryland farms) and Riverina regions and the rest of the coastal strip. The previous autumn provided excellent conditions in the southern cropping areas, however the autumn in this financial year saw a deficit of rain, impacting total annual rainfall levels as the rain dropped off. However, the coastal regions experienced some heavy rainfall events in autumn, similar to the North, resulting in flooding on farms in this region and the subsequent need for re-establishment of pastures in some cases and some farm infrastructure.

The summer period provided much milder temperatures than previous years as per the experience in the North. The end of the year saw water storage levels providing much improved water availability as a result of significant rainfall, good soil moisture levels and stream flows.

Figure 22 shows the difference between annual rainfall and long term averages for each farm. 3 of the 19 farms received just below their long term average rainfall.

## Whole farm analysis

Participant dairy farmers in the South received an average milk price of \$8.51/kgMS sold this year, up from \$8.36/kg MS in the previous year.

Average herd size for the South farms was 442 cows, and milk solids production per cow was higher this year at 578 kg MS/cow. The average home grown feed as a percentage of ME consumed was higher at 52%, compared to 47% in the previous year. Stocking rate was 1.3 cows/usable hectare.

Good rainfall and irrigation meant the amount of homegrown feed utilised (directly grazed pasture and conserved) increased. This meant less reliance on purchased feeds.

Grain and fodder prices fell from the highs of 2019/20 with purchased fodder much more accessible, if needed. Farms in the region grew their fodder inventory by the end of the year due to the better season, with an average of 549 tDM on hand. For some of the farms this has been a strategic decision, or risk management strategy, with the memory of the last few years of feed shortages still fresh in mind.

Labour efficiency was slightly lower than the previous year on both a cows/FTE and kgMS/FTE basis.

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

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

**Table 7** Farm physical data – South

Farm physical parameters	South average	Q1 to Q3 range	Top 25% average
Annual rainfall 2020/21 (mm)	1,192	735–1,592	1,078
Herd size	442	285–450	384
Total water use efficiency (t DM/100mm/ha)	0.6	0.3–0.9	0.7
Total usable area (hectares)	416	230–493	381
Milking cows per usable hectares	1.3	0.9–1.6	1.1
Milk sold (kg MS/cow)	578	515–585	621
Milk sold (kg MS/ha)	710	483–897	662
Home grown feed as percentage of ME consumed	52%	44%–61%	54%
Labour efficiency (cows/FTE)	83	70–93	76
Labour efficiency (kg MS/FTE)	46,621	37,368–53,377	46,320

## Milk solids sold

Average milk solids sold per hectare increased this year to 710 kgMS/ha (9,718 litres/ha). The Q1–Q3 range this year was between 483 kg MS/ha and 897 kg MS/ha (6,611 litres/ha to 12,278 litres/ha).

The average milk solids sold per cow were higher than last year, at 578 kg MS/cow (7,857 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 \$9.53/kgMS (70.4 c/l), which included milk income of \$8.51/kg MS (62.8 c/l) plus all other income associated with the dairy business operation of \$1.03/kg MS (7.6 c/l).

This year's average gross farm income was 2.3% higher than last year's average. The milk price received was up 1.8%, livestock income was similar, and other farm income increased from last year. Other farm income includes fodder sales and grants received such as the small business stimulus package in response to the coronavirus pandemic.

Figure 24 shows the gross farm income for each farm.

Figure 22 Annual rainfall and long term average rainfall

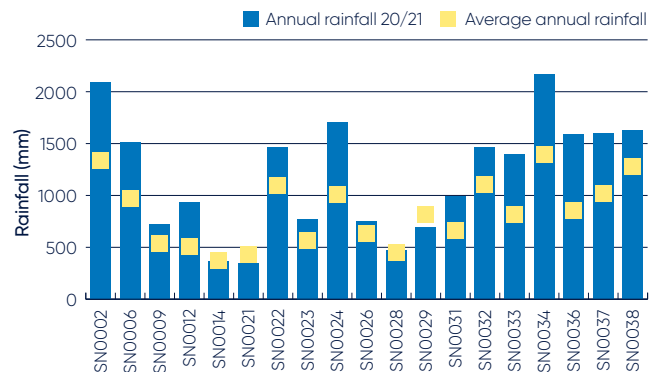


Figure 23 Milk solids sold per hectare and per cow

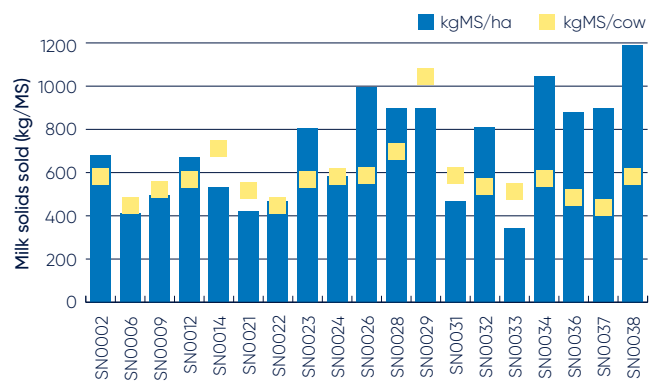
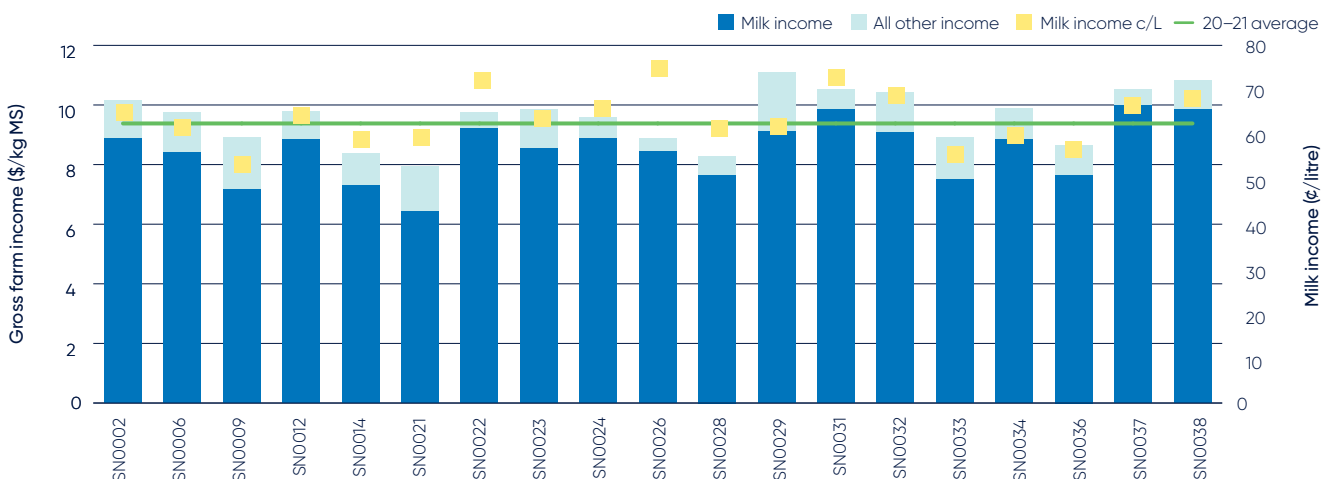


Figure 24 Gross farm income per kilogram of milk solids



## 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 \$4.03/kg MS (29.7 c/l) with a Q1–Q3 range of \$3.64/kg MS to \$4.40/kg MS for participant farms in the South. This is 23% lower than in 2019/20 due to a significant decrease in purchased feed and agistment costs and a build-up in fodder inventory.

Feed costs were the most significant variable cost, accounting for 50% of total costs, although this is down from 59% last year which was impacted by the drought. Average total feed cost including feed inventory change was \$3.46/kgMS (25.5 c/l) down 26% from \$4.67/kg MS (35.1 c/l), last year.

The average cost of home-grown feed increased to \$1.25/kgMS from \$1.13/kg MS in the previous year. Purchased feed and agistment cost was \$2.53/kgMS, down from \$3.58/kgMS in the previous year, reflecting better operating conditions compared to last year.

The average cost of concentrates this year was \$408/tDM (\$367 as fed) down from \$522/t DM (\$472 as fed) last year. The cost of concentrate includes the cost of additives and minerals. South farmers fed 2.7 t DM/hd of concentrates to the milkers, up from 2.2 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 \$301/tDM (\$256/t as fed), down from \$357/tDM (\$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.

## 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.

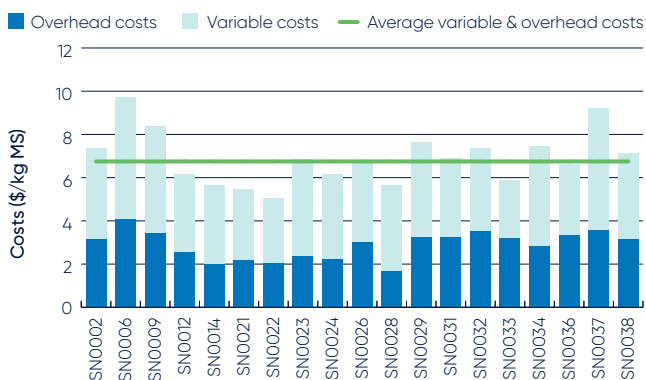
The average overhead costs for 2020/21 were \$2.88/kgMS (21.2 c/l), slightly higher than the previous year. The overhead costs this year ranged from \$1.65 /kg MS to \$4.06/kg MS (shown as blue bars in Figure 25).

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 \$1.72/kgMS account for 60% of total overheads.

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

**Figure 25** Whole farm variable and overhead costs



**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	c/l
<b>Income</b>					
Milk income (net)	8.51	62.8	7.65–9.11	8.49	62.6
Livestock trading profit	0.84	6.2	0.66–1.04	0.99	7.3
Other farm income	0.19	1.4	0–0.37	0.00	1.7
<b>Total income</b>	<b>9.53</b>	<b>70.4</b>	<b>8.85–10.19</b>	<b>10.07</b>	<b>71.6</b>
<b>Variable costs</b>					
Herd cost	0.33	2.5	0.2–0.42	0.33	2.5
Shed cost	0.24	1.8	0.17–0.25	0.26	1.9
Home grown feed cost	1.25	9.4	0.87–1.18	1.33	9.8
Purchased feed and agistment	2.53	18.6	2.3–2.8	2.34	17.3
Feed inventory change	-0.32	-2.5	-0.36–0.01	-0.55	-4.1
Water inventory change	0.00	0.0	0–0	0.01	0.0
Total feed costs	3.46	25.5	3.02–3.91	3.13	23.1
Total variable costs	4.03	29.7	3.64–4.4	3.72	27.4
<b>Gross margin</b>	<b>5.50</b>	<b>40.7</b>	<b>4.5–5.88</b>	<b>6.00</b>	<b>44.2</b>
<b>Overhead costs</b>					
Employed labour	1.05	7.7	0.72–1.29	0.92	6.6
Repairs and maintenance	0.46	3.4	0.32–0.54	0.46	3.4
All other overheads	0.33	2.4	0.26–0.41	0.30	2.2
Imputed labour	0.67	4.9	0.31–0.99	0.78	5.8
Depreciation	0.38	2.8	0.26–0.47	0.35	2.6
Total overhead costs	2.88	21.2	2.29–3.3	2.82	20.7
Variable and overhead costs	6.91	50.9	6.03–7.41	6.54	48.1
<b>Earnings before interest and tax</b>	<b>2.62</b>	<b>19.4</b>	<b>2.18–3.24</b>	<b>3.18</b>	<b>23.5</b>

## 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 \$6.93 (51 c/l), down from \$7.95/kg MS (59.6 c/l) last year.

The top 25% farms had a 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 9** Cost of production

Farm costs	South average		Q1 to Q3 range	State top 25% average	
	\$ kg/MS	c/l	\$ kg/MS	\$ kg/MS	c/l
Cash cost of production	6.19	45.8	5.59 - 6.87	5.95	43.7
Cost of production (excluding inventory changes)	7.23	53.4	6.64 - 7.6	7.08	52.1
<b>Inventory change</b>					
+/- feed and water inventory changes	-0.32	-2.5	-0.45 - 0	-0.54	-4.0
+/- livestock inventory changes minus purchases	0.02	0.0	-0.26 - 0.13	-0.06	-0.5
Cost of production including inventory change	6.93	51.0	6.11 - 7.61	6.48	47.6



## Earnings before interest and tax

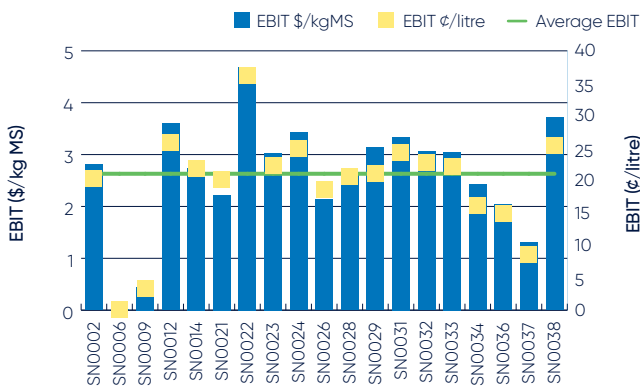
Earnings before interest and tax (EBIT) is gross farm income less variable and overhead costs (cash and non-cash).

The average EBIT across farms this year increased by 83% to \$2.62/kgMS (19.4 c/l) compared to \$1.43 /kg MS (10.5 c/l) last year. The reduction in purchased feed and agistment costs enabled a stronger profit margin.

Figure 26 shows all farms in the South achieved a positive EBIT, ranging from \$0.01/kgMS to \$4.69/kgMS.

The top 25% farms in the state recorded an average EBIT of \$3.18/kgMS (23.5 c/l) highlighting the strength of these well run businesses. While these farms have a slightly lower milk price than the South farms as a group, they had a stronger livestock trading profit, lower purchased feed and agistment costs and built up a larger fodder inventory.

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



## 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 6.7% up from 3.8% the previous year. All farms had a positive return on assets. The range was from 0% to 14%.

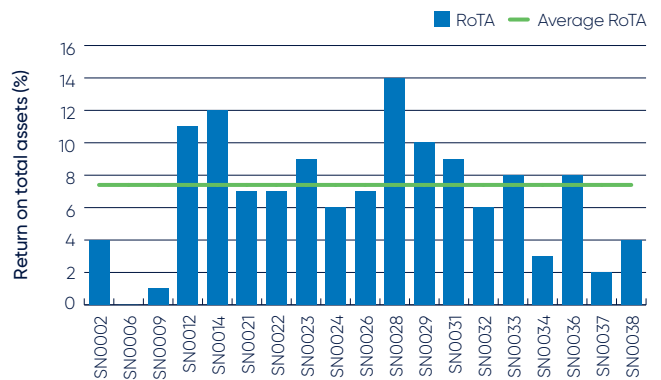
Land value is a major component of the assets under management, and it is worth noting that there is a large variation in market values for land in the South region. This is particularly so in the area south of Sydney where land attracts a premium market price due to the proximity to Sydney, so while some farms achieved a very strong EBIT, this is not reflected in their RoTA.

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.

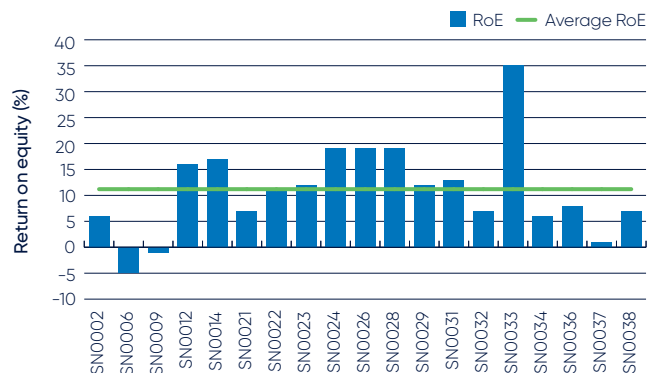
The average was higher this year at 11.0% compared to 8.8% last year. There is a wide range of return on equity reflecting the various capital structures of businesses in Southern NSW. Two farms recorded a negative RoE.

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

**Figure 27** Return on total assets



**Figure 28** Return on equity



# FEED CONSUMPTION AND FERTILISER USE

Southern participant farms show a wide range of feeding systems. In 2020/21 directly grazed pasture was not the main source of metabolisable energy on all farms in this region, due in part to the range of feeding systems.

## 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 4 of the 19 farms this year, with the average being 33%, which is similar to the 32% last year. The range was between 0% and 63%. The portion of the ME consumed derived from concentrates was slightly higher than the previous year at 38%. All participant farms fed silage and all but one, hay. Hay and silage accounted for 27% of ME consumed on average. This is a decrease on the previous year by 4%.

The "Other" feed category includes feeds such as brewer's grain, palm kernel meal and bi-products.

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

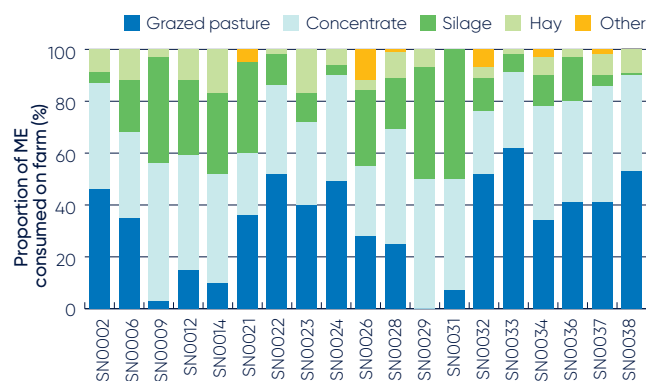
Total homegrown feed for the South on average was 7.2 t DM/milking ha, which was higher than the previous year. This year the amount of directly grazed pasture was higher than the previous year, and the amount conserved per hectare was also higher than the previous year. This included an average of 5.1 t DM/ha directly grazed and 2.1 t DM/ha conserved.

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

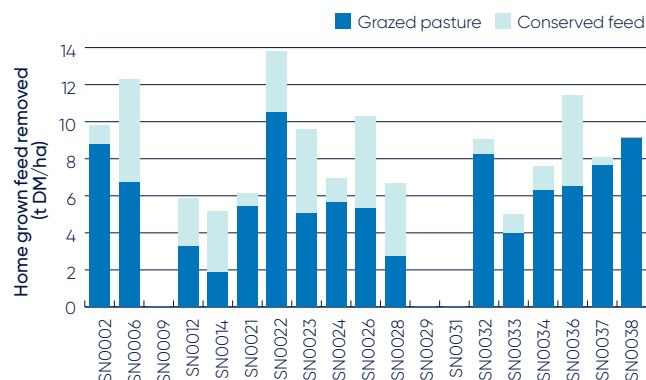
Farms that confine cows to a feedpad or feedlot area for the majority of the year have a much smaller milking area by definition, than those farms where cows mainly graze. They will show as little or no pasture removed from the milking area.

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.

**Figure 29** Sources of whole farm metabolisable energy



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



## Fertiliser application

The proportion of nutrients in fertiliser applied per hectare on South farms in 2020/21 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.

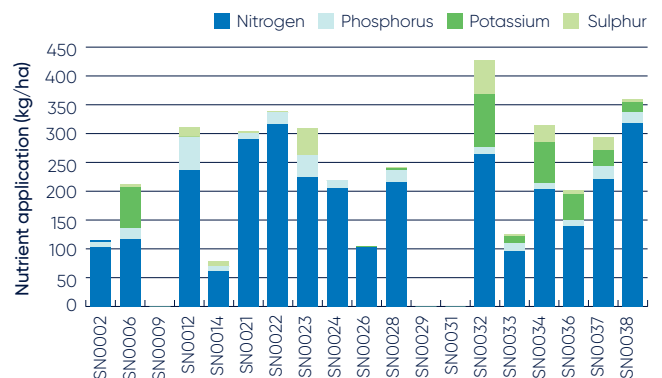
All farms applied some fertiliser to their crops and pasture, though not all on the milking area. The average fertiliser application was 208 kgs nutrient/milking hectare, down from 257 kgs/ha last year.

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

Application rates in 2020/21 were: nitrogen 164.3 kg/ha, phosphorus 14.5 kg/ha, potassium 18.2 kg/ha and sulphur 11.2 kg/ha.

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

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 2021 with regard to the 2021/22 financial year and the next five years.

### Expectations for business returns

Following higher average profits in the 2020/21 year and with a general easing of seasonal conditions across the financial year, farmer's expectations about business profit for the 2021/22 season were very positive. 64% of farmers in the North, and 79% in the South expected an improvement in business profit, whilst 36% in the North and 21% in the South thought profit would be stable.

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

Expectations of the coming year were spread across categories, as shown in Figure 32.

100% of the participants in the North had an expectation of an improvement or stable farm business returns in 2021/22, as was the case in the South. No farms in either region expected declining returns.

### Price and production expectations – milk

There are mixed expectations about milk price, however the majority of farmers expect prices to increase or remain stable in both regions, with one farm expecting a decrease in milk prices.

As shown in Figure 33, intentions about increasing milk production were similar across the regions. For the North farms, 64% of respondents intend to increase milk production, and 32% expected to remain the same. One expects milk production to decline.

In the South, nearly 68% intend to increase production, whilst 32% expect to remain the same.

### Production expectations – fodder

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

59% of farmers in the North and 53% in the South expect fodder production to increase in 2021/22 (Figure 34), with the remainder expecting stable levels of fodder production. There are no expectations for fodder production to decrease, reflective of the favourable seasonal conditions and outlook for the year ahead.

Figure 32 Expected farm business profit in 2020/21

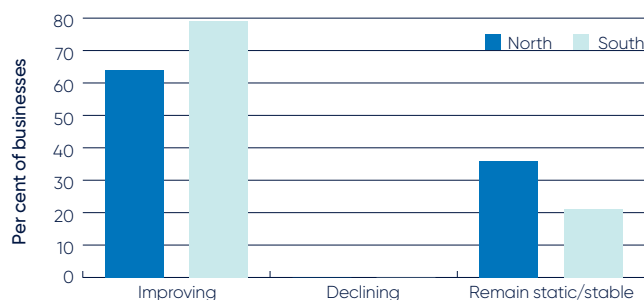


Figure 33 Producer expectations of prices and production of milk in 2020/21

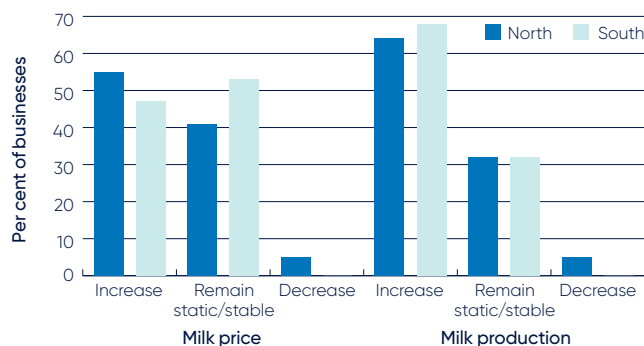
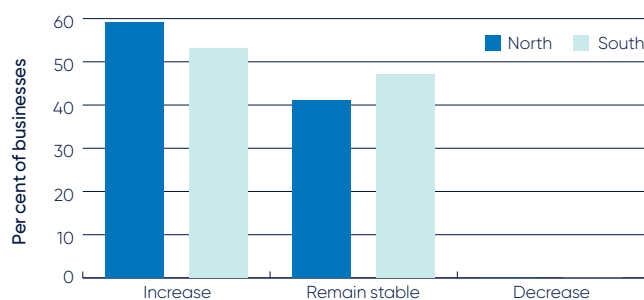


Figure 34 Producer expectations for production of fodder in 2020/21



### 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 fertiliser this year. This is reflective of the increases in price seen for urea due to global fertiliser markets at the end of the financial year. Urea prices surged 19% in June (Source: Dairy Australia). 49% of respondents also expected an increase in fuel and oil costs.

The majority of farmers (more than 50%) 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 44% of the respondents identified seasonal conditions as the most important issue they are facing in the short term (next 12 months). The drought will still be fresh in the minds of many and with devastating fires and recent flooding, the volatility in climate remains a major concern across the whole state.

Labour and milk price are the next most important issues, followed by input prices. Labour has ranked the same as last year with 17% of farmers giving it high priority. Stable milk prices mean this is less of a priority compared to two years ago and ranks the same as it did last year when there were general increases in pricing due to a milk supply shortage and therefore strong competition in most areas of NSW.

Pasture and fodder and succession planning were less important issues in the short term in this survey. Water does not appear to be an issue in the current environment.

Some farmer comments were:

- Consolidate the position and reduce debt. Keep pushing cow numbers but be flexible to match the seasonal conditions.
- Main challenge is finding suitable support areas for heifers in the area. Subdivision of farms means less options for lease blocks or agistment.
- Can deal with input prices if milk price is OK. Chemicals and fertiliser expensive at the moment.
- Building rotary dairy and extending compost barn.
- Despite difficult conditions it has been a reasonably profitable year.
- Continuing with infrastructure changes to improve efficiency.

## 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).

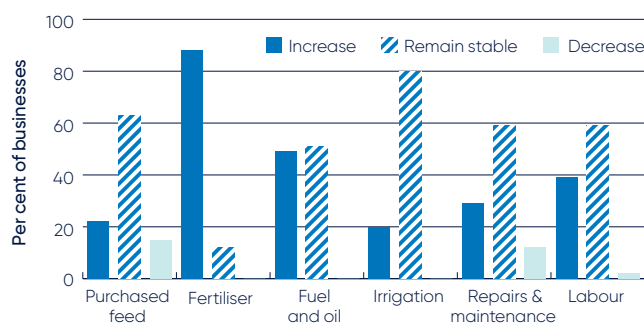
Climate/seasonal conditions are viewed as the most important issue over the next five years among the respondents as per the response for the short term. Milk price and input costs were both a long term concern last year, however there was a 10% increase in milk price as a concern and an 11% increase in input costs as a concern this year. Labour ranked fourth as a concern this year

back from third last year, with water no longer viewed as a major concern by respondents.

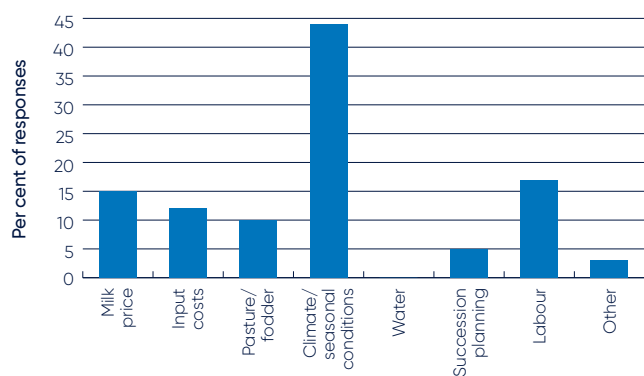
Farmer comments included;

- Impact of climate change is biggest concern – will that mean we have to change our production? More extreme weather more often, especially floods, will have an impact on the farm. No irrigation, we can't smooth out the dry periods.
- Succession planning and potential expansion/capital are considerations.

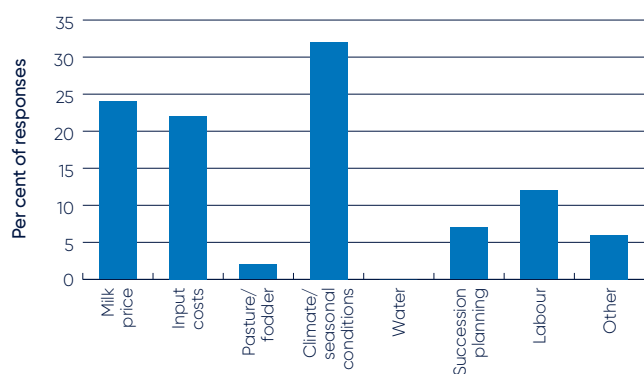
**Figure 35** Producer expectations of costs for the dairy industry in 2020/21



**Figure 36** Major issues for individual businesses – 12 month outlook



**Figure 37** Major issues for individual businesses – 5 year outlook





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# Greenhouse gas emissions



The average emissions from participating farms was 15.2 tonnes of carbon dioxide equivalents per tonne of milk solids (t CO<sub>2</sub>-e/t MS) in 2020/21. The most significant source of on-farm emissions were methane from enteric and effluent pond sources, contributing 63% of total farm emissions. The next biggest contributor was from pre-farm emissions sources (carbon dioxide from purchased feed and fertiliser), contributing 14%.

Carbon dioxide equivalents (CO<sub>2</sub>-e) are used to standardise the greenhouse potentials from different gases. The Global Warming Potential (GWP) is the index used to convert relevant non-carbon dioxide gases to a carbon dioxide equivalent. This is calculated by multiplying the quantity of each gas by its GWP. All of the data in this section is in CO<sub>2</sub>-e tonnes and expressed per tonne of milk solids produced (CO<sub>2</sub>-e/t MS).

The method of estimating Australia's dairy industry greenhouse gas emissions reflects new research outcomes and aligns with international guidelines. The GWP for the three gases discussed in this report is 1: 25: 298 (carbon dioxide; CO<sub>2</sub>; methane; CH<sub>4</sub>; nitrous oxide; N<sub>2</sub>O). This year the greenhouse emission was calculated through DairyBase using the Australian Dairy Carbon Calculator.

The distribution of different emissions for 2020/21 is shown in Figure 38. Greenhouse gas emissions per tonne of milk solids produced ranged from 11.0 t CO<sub>2</sub>-e/t MS to 19.2 t CO<sub>2</sub>-e/t MS with an average emission level of 15.2 t CO<sub>2</sub>-e/t MS.

Methane was identified as the main greenhouse gas emitted from dairy farms, accounting for 9.6 t CO<sub>2</sub>-e/t MS, 63% of all greenhouse emissions. Methane produced from ruminant digestion (enteric CH<sub>4</sub>) was the major source of emissions from all farms in this report, with an average of 54% of total emissions. Methane from effluent ponds accounted for 9% of total emissions on average across the state in 2020/21.

The second main greenhouse gas emission on farm was CO<sub>2</sub> being produced primarily from fossil fuel consumption as either electricity or petrochemicals. Carbon dioxide accounted for 23% of total emissions (3.6 t CO<sub>2</sub>-e/t MS) in 2020/21. The estimation of greenhouse gas emissions includes a pre-farm gate emission source. These are the greenhouse gases emitted during the manufacturing of fertilisers and the production of purchased fodder, grain and concentrates. Pre-farm gate sources accounted for 14% of the emissions and 9% from on-farm energy sources. Output levels are highly dependent on the source of electricity used with an increasing number of farms

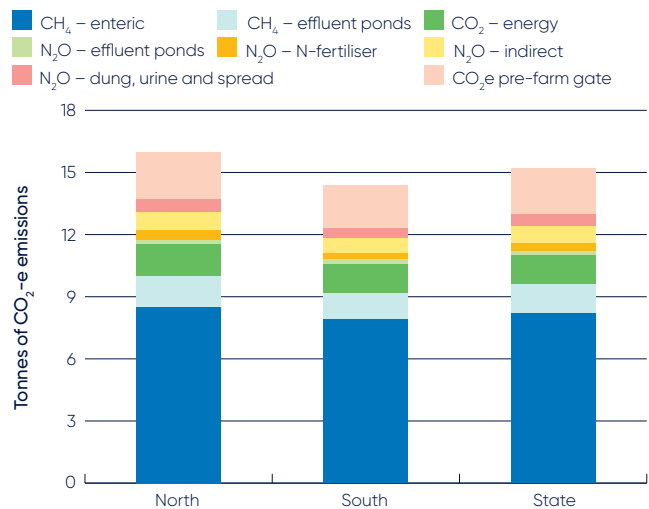
installing solar panels to generate electricity and offset the rising cost of electricity.

The third main greenhouse gas emission was nitrous oxide N<sub>2</sub>O, accounting for 13% of total emissions or 2.0 t CO<sub>2</sub>-e/t MS. This gas is produced from wastes (dung and urine); applied fertiliser and effluent ponds.

Nitrous oxide emissions from fertiliser accounted for 2.7% of total emissions, effluent ponds accounted for 1.3% and excreta accounted for 3.8%. Nitrous oxide from indirect emissions was 5.3%. Nitrous oxide emissions are highest in warm, waterlogged soils with readily available nitrogen. Over application of nitrogen, high stocking intensity and flood irrigation are all potential causes of increased nitrogen loss as N<sub>2</sub>O. Strategic fertiliser management practices can reduce N<sub>2</sub>O 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](http://environment.gov.au/climate-change).

**Figure 38** 2020/21 Greenhouse gas emissions per tonne of milk solids produced (CO<sub>2</sub> equivalent)





## Greenhouse gas emissions – North

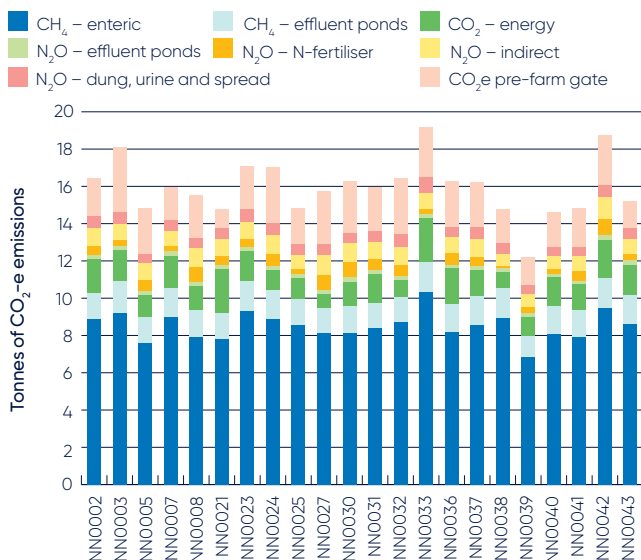
Participant farms in the North emitted an average of 16 t CO<sub>2</sub>-e/t MS in 2020/21, mainly from methane from enteric and effluent pond sources (63%) and carbon dioxide from purchased feed and fertiliser (1%).

Methane was the main greenhouse gas emitted from participant farms in the North, accounting for 10 t CO<sub>2</sub>-e/t MS, 63% of the average total greenhouse emissions (Figure 39). Methane produced from ruminant digestion contributed 8.5 t CO<sub>2</sub>-e/t MS to regional average emissions while methane from effluent ponds accounted for 1.5 t CO<sub>2</sub>-e/t MS.

Carbon dioxide accounted for 3.8 t CO<sub>2</sub>-e/t MS, 24% of emissions in 2020/21, which comprised 1.5 t CO<sub>2</sub>-e/t MS from fossil fuels and 2.3 t CO<sub>2</sub>-e/t MS from pre-farm gate sources.

Nitrous oxide emissions contributed 2.2 t CO<sub>2</sub>-e/t MS, 13.8% of all emissions. Direct emissions from applied nitrogen fertiliser, effluent management systems and animal wastes accounted for 1.3 t CO<sub>2</sub>-e/t MS. The balance of 0.9 t CO<sub>2</sub>-e/t MS came from ammonia and nitrate loss in soils as indirect sources.

**Figure 39** 2020/21 Greenhouse gas emissions per tonne of milk solids produced – North



## Greenhouse gas emissions – South

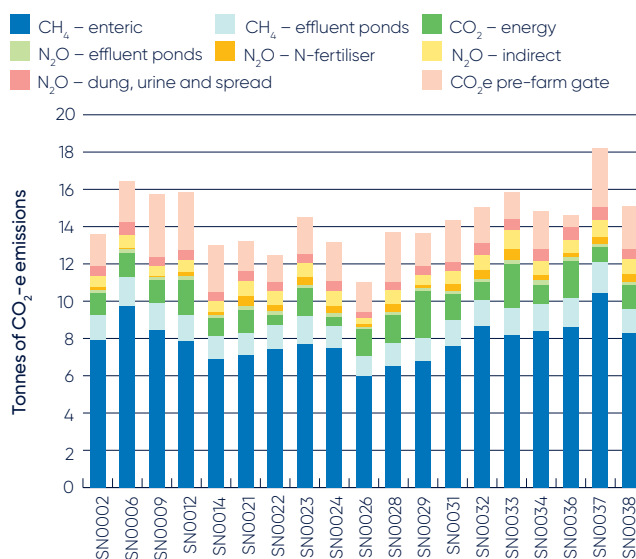
Participant farms in the South emitted an average of 14.4 t CO<sub>2</sub>-e/t MS in 2020/21 mainly from methane from enteric and effluent pond sources (64%) and carbon dioxide from purchased feed and fertiliser (15%).

Methane was the main greenhouse gas emitted from participant farms in the South accounting for 9.2 t CO<sub>2</sub>-e/t MS, 64% of the average total greenhouse emissions. Methane produced from ruminant digestion was 7.9 t CO<sub>2</sub>-e/t MS and CH<sub>4</sub> from effluent ponds accounted for 1.3 t CO<sub>2</sub>-e/t MS (Figure 40).

Carbon dioxide emissions were 3.5 t CO<sub>2</sub>-e/t MS, 24% of emissions in 2020/21, comprised of 1.4 t CO<sub>2</sub>-e/t MS from fossil fuels and 2.1 t CO<sub>2</sub>-e/t MS from pre-farm gate sources.

Nitrous oxide emissions contributed 1.7 t CO<sub>2</sub>-e/t MS, 12% of all emissions. Direct emissions from applied nitrogen fertiliser, effluent management systems and animal wastes accounted for 1.0 t CO<sub>2</sub>-e/t MS. The balance of 0.7 t CO<sub>2</sub>-e/t MS came from ammonia and nitrate loss in soils as indirect sources.

**Figure 40** 2020/21 Greenhouse gas emissions per tonne of milk solids produced – South



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# Historical analysis





The 2020/21 year started out as a very promising year for the NSW dairy industry as the conditions continued to improve with good rainfall and mild temperatures on the back of the retraction of drought.

Conditions deteriorated in most coastal regions with one in one-hundred year flooding occurring during Autumn. In the North, this was on the back of an already wet December period. However with the return to more 'normal' fodder prices and more homegrown feed in the diet and the continuation of strong milk prices in general, the average performance across the State improved dramatically. Average state-wide farm profits in 2020/21 were the highest in the ten year history of the project for EBIT and for Return on Total Assets. Both regions saw a significant improvement in profit.

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

*This section compares the performance of participant farms in the Dairy Farm Monitor Project over the past ten 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 ten-year average for return on total assets (Figure 41) for the North is 1.6%, with a range of 0.5% to 3.3%. This year RoTA was 3.3%, the highest in the ten year period.

The ten-year average return on equity was 0%, with a range of negative 1.6% to 2.2%. This year the North RoE was 0.0%.

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 2020/21 the average EBIT per farm was \$273,109 up 93% from \$141,281 last year and the highest in the ten-year period. The ten-year average (in real terms – including inflation) for EBIT for North farms was \$121,854 per farm.

Regarding net farm income, for three out of the ten years the average was negative, meaning many farms made a loss after covering the cost of debt servicing and leasing. This year the ten year average NFI improved to \$29,460 per farm.

The 2020/21 year saw milk price remain relatively stable in the North (a small decrease of \$0.06/kgMS), while other farm income increased. However, production costs decreased, meaning the profit margin was higher. Feed costs were the main contributor to the fall in costs, while an increase in livestock trading profit helped improve gross farm income.

Figure 41 Historical whole farm performance – North

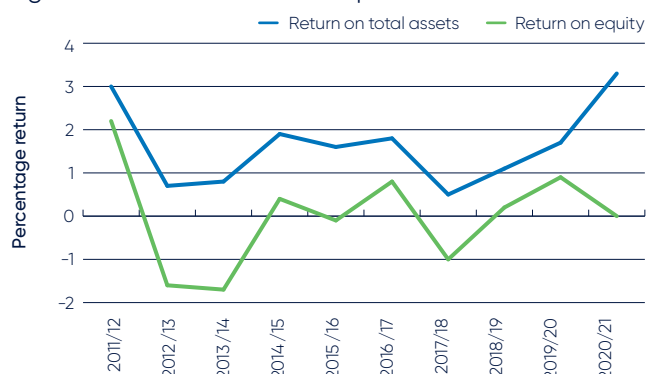
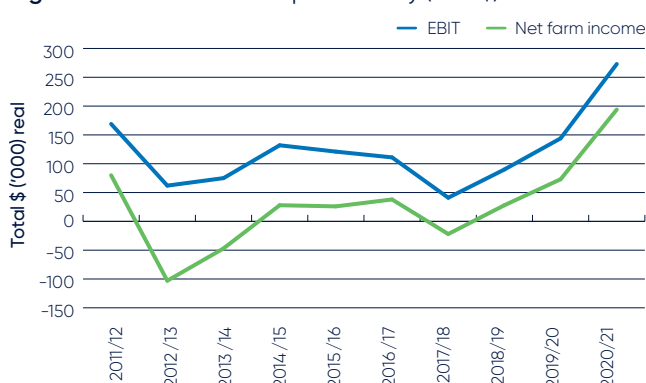


Figure 42 Historical farm profitability (real \$) – North



## The South

The graphs below show the trends in profits and returns over the past ten years. 2020/21 saw the highest profit levels for the South region over the life of the project. The ten-year average for return on total assets (Figure 43) for the South is 3.9%, with a range of 0.3 to 6.7%; and for return on equity the average is 4.1%, with a range of -2.1 to 11.0%.

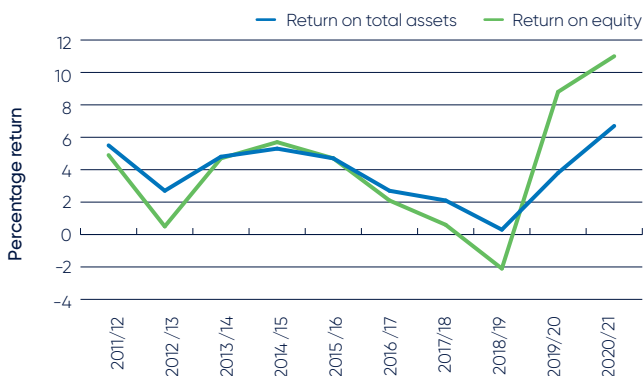
Figure 44 shows the trend in earnings before interest and tax (EBIT) and in net farm income. 2020/21 was the highest profit year over the course of the project, with an average EBIT per farm of \$701,079 up from \$406,083, in the previous year. The ten-year average EBIT for South farms (in real terms – including inflation) is \$329,324.

As experienced in the North, 2020/21 saw milk price remain relatively stable in real terms. Livestock trading profit remained similar to the previous year, while other farm income was slightly up. Feed costs were lower and so profits improved.

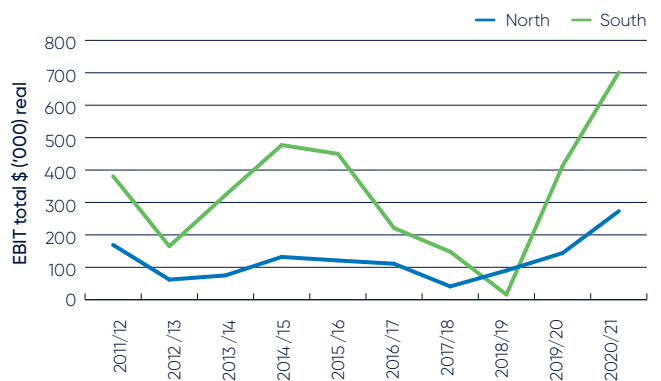
Average return on total assets for the South farms in 2020/21 was 6.7%, while return on equity averaged 11.0%. These are the highest figures for the South in the ten years of the project.

This year sees a strong continuation of the upward trend in profits and returns in the South since 2019/20.

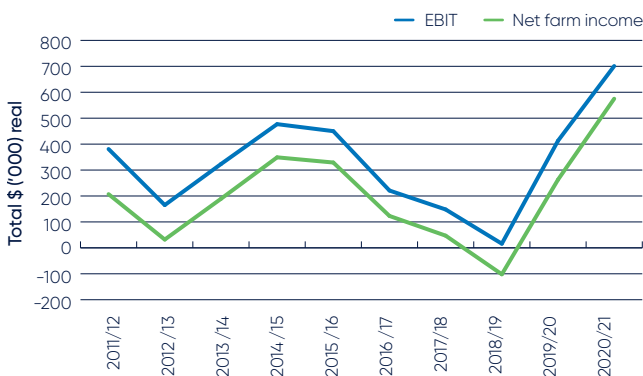
**Figure 43** Historical whole farm performance – South



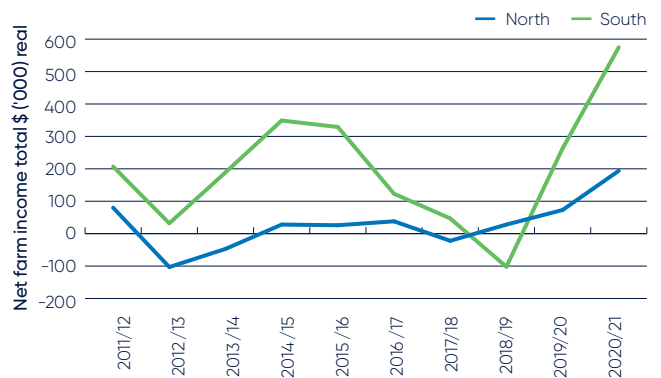
**Figure 45** Regional historical earnings before interest and tax (real \$)



**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 ten years is compared in Figures 45 to 48.

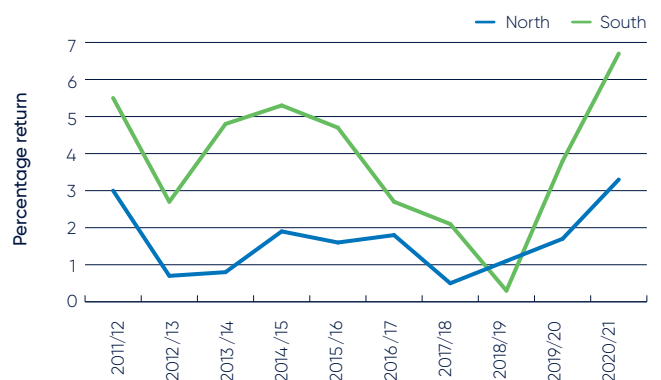
In 2020/21 the South continued its upward trend from last year to the highest level of profitability in the ten years. It showed a higher return than the North farms.

The North farms experienced an improvement in profit for the third year in a row.

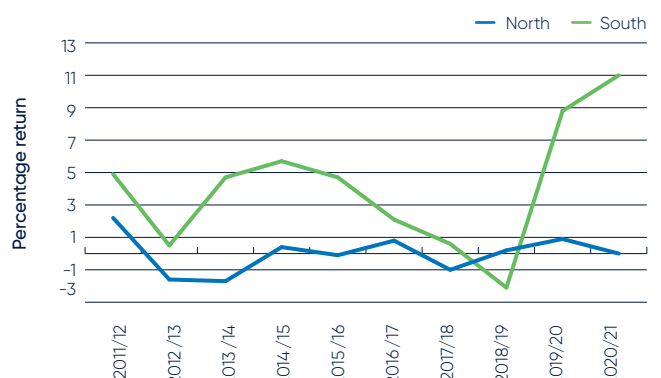
The South has performed well over time relative to the North, and for total earnings before interest and tax in real terms the South's performance has again surpassed that of the North. This region has also received a lower milk price than the North each year in the history of the project, reflecting 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 compared to 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	\$ kgMS	%
Average	8.94	1.19	10.12	4.63	3.43	58	2.07	4.9	0.57	6	1.50	5.1
Top 25	8.49	1.23	9.72	3.72	2.82	57	3.18	9.7	0.42	4	2.76	15.7

**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	135	0.5	371	1.3	522	649	4.1	3.3
Top 25	381	170	0.7	384	1.1	621	662	4.1	3.3

	Estimated grazed pasture*	Estimated conserved feed*	Home grown feed as % of ME consumed	Nitrogen application	Phosphorous application	Potassium application	Sulphur application	Labour efficiency	Labour efficiency
	t DM/ha	t DM/ha	% of ME	kg/ha	kg/ha	kg/ha	kg/ha	hd/FTE	kg MS/FTE
Average	5.9	2.4	57	230	20	38	26	74	38,438
Top 25*	3.8	3.0	54	143	22	16	18	76	46,320

\*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	3.2	456	309	315	390	421	43
Top 25	3.7	435	241	249	102	398	46

Calculation of average price of silage, hay and other feed excludes zero values.

**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	0.22	0.07	0.15	0.14	0.71	0.53	0.11	0.26
Top 25	0.12	0.16	0.06	0.12	0.13	0.59	0.46	0.15	0.35

	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	0.15	0.37	0.01	0.33	2.22	0.05	(0.10)	3.92	4.63
Top 25	0.12	0.25	0.00	0.31	1.94	0.09	(0.55)	3.13	3.72

**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	0.06	0.11	0.06	0.53	0.18	1.11	2.05	0.40	0.97	3.43
Top 25	0.04	0.09	0.03	0.46	0.15	0.92	1.69	0.35	0.78	2.82

**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	1.7	2.7	0.9	1.8	1.7	8.8	6.5	1.6	3.5
Top 25	1.8	2.4	0.9	1.9	2.0	9.0	7.0	2.3	5.4

	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	1.9	4.6	0.1	4.2	27.8	0.7	-2.1	48.8	57.6
Top 25	1.9	3.8	0.0	5.1	29.9	1.4	-8.7	48.0	57.1

**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	0.8	1.4	0.7	6.6	2.2	13.9	25.6	5.0	11.8	42.4
Top 25	0.5	1.3	0.4	7.1	2.3	13.7	25.5	5.3	12.1	42.9

**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	18,855	14,695	2,244	2,026	1,998	3,042	457	542	25,182
Top 25	13,446	12,067	3,505	3,495	1,681	2,644	627	287	19,794

	Liabilities		Equity	
	Liabilities per usable hectare	Liabilities per milking cow	Equity per usable hectare	Average equity
	\$/ha	\$/cow	\$/ha	%
Average	7,093	5,642	18,907	73
Top 25	6,254	5,918	13,540	69

Calculation of average values of land, water asset and equity excludes zero values

**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)
2011/12	6.88	8.15	7.76	9.19	0.33	0.39	0.27	0.32	3.02	3.57	3.62	4.29
2012/13	6.43	7.41	7.20	8.30	0.33	0.38	0.28	0.32	3.18	3.66	3.79	4.37
2013/14	7.15	8.02	8.00	8.98	0.31	0.34	0.30	0.33	3.46	3.88	4.06	4.55
2014/15	7.46	8.18	8.44	9.26	0.32	0.35	0.29	0.32	3.55	3.89	4.16	4.56
2015/16	7.34	7.95	8.23	8.91	0.35	0.38	0.27	0.29	3.33	3.61	3.94	4.27
2016/17	6.89	7.32	7.94	8.44	0.38	0.40	0.26	0.28	3.27	3.47	3.91	4.15
2017/18	7.27	7.58	8.00	8.34	0.36	0.38	0.28	0.30	3.89	4.06	4.53	4.72
2018/19	7.74	7.97	8.68	8.94	0.31	0.32	0.31	0.32	4.49	4.63	5.11	5.27
2019/20	8.88	9.03	9.85	10.01	0.37	0.38	0.28	0.28	4.79	4.87	5.44	5.53
2020/21	8.94	8.94	10.12	10.12	0.42	0.42	0.29	0.29	3.92	3.92	4.63	4.63
<b>Average</b>	<b>8.06</b>	<b>8.06</b>	<b>9.05</b>	<b>9.05</b>	<b>0.37</b>	<b>0.37</b>	<b>0.30</b>	<b>0.30</b>	<b>3.96</b>	<b>3.96</b>	<b>4.63</b>	<b>4.63</b>

Note: 'Real' dollar values are the nominal values converted to 2020/21 dollar equivalents by the consumer price index (CPI) to allow for inflation. From 2016/17 Gross farm income does not include feed inventory changes and changes to the value of carry-over water. These are included in feed costs.

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)		
2011/12	1.56	1.85	1.24	1.47	2.80	3.32	1.34	1.59	0.59	0.69	0.75	0.89	4.3%	3.6%
2012/13	1.71	1.97	1.19	1.37	2.90	3.34	0.51	0.59	0.62	0.71	(0.10)	(0.12)	1.7%	-0.5%
2013/14	1.80	2.02	1.25	1.40	3.05	3.42	0.88	0.99	0.62	0.70	0.26	0.29	2.6%	1.3%
2014/15	1.71	1.88	1.25	1.37	2.96	3.25	1.32	1.45	0.60	0.65	0.72	0.79	3.5%	2.8%
2015/16	1.75	1.89	1.41	1.53	3.16	3.42	1.12	1.21	0.54	0.58	0.58	0.63	3.0%	2.1%
2016/17	1.80	1.91	1.31	1.39	3.11	3.30	0.92	0.98	0.51	0.55	0.41	0.44	2.2%	1.4%
2017/18	1.70	1.77	1.44	1.50	3.14	3.27	0.33	0.34	0.51	0.54	(0.18)	(0.19)	1.2%	-0.3%
2018/19	1.88	1.93	1.32	1.36	3.19	3.29	0.38	0.39	0.54	0.55	(0.16)	(0.17)	0.7%	-0.8%
2019/20	1.98	2.02	1.37	1.39	3.35	3.41	1.05	1.07	0.59	0.60	0.46	0.47	2.7%	4.7%
2020/21	2.05	2.05	1.37	1.37	3.43	3.43	2.07	2.07	0.57	0.57	1.50	1.50	4.9%	5.1%
<b>Average</b>		<b>1.93</b>		<b>1.42</b>		<b>3.35</b>		<b>1.07</b>		<b>0.62</b>		<b>0.45</b>	<b>2.7%</b>	<b>1.9%</b>

**Table A10** Historical data – average farm physical information

Year	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	
	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)
2011/12	300	133	0.49	375	1.4	478	663	6.4	1.3	57	304	360
2012/13	329	140	0.55	349	1.2	492	608	6.9	1.3	56	323	372
2013/14	301	119	0.60	309	1.1	504	569	6.0	1.1	57	412	462
2014/15	287	128	0.51	338	1.2	506	602	6.5	1.8	58	413	453
2015/16	287	126	0.55	351	1.3	504	618	6.2	2.1	55	392	424
2016/17	263	120	0.56	326	1.3	498	646	6.9	1.6	59	357	379
2017/18	251	118	0.67	337	1.4	488	683	6.0	1.6	56	423	441
2018/19	342	144	0.74	373	1.3	491	610	6.3	1.8	60	567	585
2019/20	365	143	0.57	384	1.2	512	625	5.4	1.8	51	555	564
2020/21	365	135	0.47	371	1.3	522	649	5.9	2.4	57	456	456
<b>Average</b>	<b>309</b>	<b>130</b>	<b>0.57</b>	<b>351</b>	<b>1.27</b>	<b>499</b>	<b>627</b>	<b>6.25</b>	<b>1.68</b>	<b>57</b>	<b>420</b>	<b>450</b>

\*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	9.26	1.97	11.23	4.70	5.31	47	1.23	2.0	0.09	1	1.13	2.1
NN0003	9.45	1.27	10.72	6.95	4.44	61	(0.68)	-1.5	0.48	4	(1.15)	-4.4
NN0005	9.43	0.52	9.95	4.53	3.69	55	1.74	4.6	-	0	1.74	4.6
NN0007	8.40	1.50	9.89	3.74	3.05	55	3.11	6.8	0.28	3	2.83	8.9
NN0008	9.36	0.98	10.35	5.55	3.42	62	1.38	5.2	-	0	1.38	5.2
NN0021	8.80	0.56	9.36	5.51	3.88	59	(0.02)	0.0	0.17	2	(0.20)	-0.3
NN0023	9.13	1.10	10.23	5.70	4.89	54	(0.36)	-0.6	0.19	2	(0.55)	-0.9
NN0024	9.24	2.74	11.98	4.38	3.64	55	3.96	9.2	0.24	2	3.72	13.2
NN0025	9.80	0.74	10.54	5.31	4.08	57	1.15	2.6	0.56	5	0.59	1.9
NN0027	10.23	0.84	11.07	5.68	3.80	60	1.59	4.0	0.70	6	0.90	4.0
NN0030	9.86	1.02	10.88	5.52	5.99	48	(0.64)	-1.1	0.90	8	(1.53)	-6.5
NN0031	8.85	0.94	9.79	5.43	2.68	67	1.69	4.8	0.29	3	1.40	5.0
NN0032	9.37	2.52	11.88	5.70	3.12	65	3.07	5.6	0.55	5	2.52	6.8
NN0033	9.12	2.09	11.21	6.09	4.17	59	0.95	1.9	0.45	4	0.50	1.2
NN0036	9.47	1.08	10.55	5.74	2.79	67	2.02	3.5	1.38	13	0.64	2.2
NN0037	10.09	1.18	11.27	4.57	4.15	52	2.54	5.8	0.48	4	2.06	9.2
NN0038	9.82	1.04	10.87	5.33	4.81	53	0.72	1.9	0.56	5	0.16	0.7
NN0039	9.17	1.16	10.33	3.12	2.95	51	4.26	7.5	0.73	7	3.53	11.7
NN0040	9.67	2.15	11.81	5.58	3.73	60	2.50	4.4	0.66	6	1.84	6.4
NN0041	8.88	1.34	10.21	5.79	4.28	58	0.15	0.3	0.38	4	(0.23)	-0.6
NN0042	9.13	0.61	9.74	5.26	3.48	60	1.01	2.5	0.75	8	0.26	1.1
NN0043	8.36	1.73	10.09	3.16	3.36	48	3.56	3.4	1.80	18	1.76	-70.6
<b>Average</b>	<b>9.31</b>	<b>1.32</b>	<b>10.63</b>	<b>5.15</b>	<b>3.90</b>	<b>57</b>	<b>1.59</b>	<b>3.3</b>	<b>0.53</b>	<b>5</b>	<b>1.06</b>	<b>0.0</b>

**Table B2** Physical information

Farm number	Total usable area	Milking area	Total water use efficiency	Number of milking cows	Milking cows per usable area	Milk sold	Milk sold	Fat	Protein
	ha	ha	t DM/100mm/ha	hd	hd/ha	kg MS/cow	kg MS/ha	%	%
NN0002	141	50	0.25	79	0.56	521	292	3.8	3.1
NN0003	223	89	0.32	370	1.66	379	630	4.0	3.3
NN0005	193	80	0.47	300	1.55	528	821	4.0	3.4
NN0007	255	130	0.61	333	1.31	494	645	3.9	3.2
NN0008	260	130	0.65	315	1.21	574	695	4.1	3.2
NN0021	88	60	0.77	150	1.70	424	723	4.6	3.7
NN0023	85	36	0.35	88	1.04	483	500	3.8	3.3
NN0024	271	130	0.43	254	0.94	485	455	3.9	3.1
NN0025	260	120	0.32	429	1.65	492	811	3.9	3.2
NN0027	240	93	0.25	367	1.53	548	838	4.0	3.3
NN0030	110	70	0.30	174	1.58	413	654	4.0	3.3
NN0031	343	188	0.33	550	1.60	433	694	4.8	3.5
NN0032	1,110	450	0.31	705	0.64	549	349	3.7	3.3
NN0033	1,378	1	0.13	550	0.40	415	166	4.2	3.5
NN0036	250	55	0.22	270	1.08	475	513	4.1	3.1
NN0037	227	92	0.24	311	1.37	506	694	3.9	3.1
NN0038	168	52	0.21	159	0.95	476	451	3.7	3.2
NN0039	161	78	0.33	197	1.22	545	667	4.4	3.6
NN0040	275	102	0.23	350	1.27	462	589	4.0	3.3
NN0041	105	61	0.52	180	1.71	414	710	4.8	3.8
NN0042	125	73	0.77	330	2.64	394	1,041	4.2	3.2
NN0043	792	430	0.25	344	0.43	411	179	4.2	3.3
<b>Average</b>	<b>321</b>	<b>117</b>	<b>0.37</b>	<b>309</b>	<b>1.28</b>	<b>474</b>	<b>596</b>	<b>4.1</b>	<b>3.3</b>

Farm number	Estimated grazed pasture*	Estimated conserved feed*	Home grown feed as % of ME consumed	Nitrogen application	Phosphorous application	Potassium application	Sulphur application	Labour efficiency	Labour efficiency
	t DM/ha	t DM/ha	% of ME	kg/ha	kg/ha	kg/ha	kg/ha	hd/FTE	kg MS/FTE
NN0002	5.17	0.93	68	209	27	71	20	42	22,081
NN0003	3.19	-	61	127	-	-	148	67	25,489
NN0005	9.69	0.61	60	433	18	26	66	58	30,437
NN0007	8.71	1.47	65	195	-	-	-	89	43,714
NN0008	4.41	6.96	69	408	6	66	21	55	31,492
NN0021	3.89	7.39	58	274	63	103	29	70	29,842
NN0023	8.86	0.91	67	251	41	96	53	48	23,199
NN0024	5.74	0.82	65	275	36	40	78	66	32,088
NN0025	8.03	3.51	65	268	53	222	51	67	32,784
NN0027	7.21	0.87	44	565	11	46	14	60	32,656
NN0030	6.88	-	59	410	50	32	35	50	20,809
NN0031	6.84	4.05	72	336	58	85	29	89	38,545
NN0032	3.95	-	58	160	-	74	61	61	33,339
NN0033	0.00	-	50	-	-	-	-	70	29,187
NN0036	10.94	0.32	57	602	4	127	107	76	36,106
NN0037	10.07	0.47	60	397	22	12	5	44	22,084
NN0038	6.90	-	57	113	27	20	4	54	25,514
NN0039	8.90	2.87	76	176	36	61	14	77	41,825
NN0040	5.49	-	48	171	49	53	52	74	34,361
NN0041	6.61	3.47	61	321	5	23	42	68	28,063
NN0042	10.11	1.24	61	550	6	35	20	100	39,522
NN0043	3.56	0.11	79	56	13	7	4	90	37,053
<b>Average</b>	<b>6.60</b>	<b>2.25</b>	<b>62%</b>	<b>286</b>	<b>24</b>	<b>55</b>	<b>39</b>	<b>67</b>	<b>31,372</b>

\*on milking area

Calculation of the average for conserved feed excludes zero values



**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	2.44	615	-	-	-	615	32
NN0003	2.58	407	-	-	324	395	39
NN0005	2.71	419	954	372	-	428	40
NN0007	2.36	481	436	173	-	400	35
NN0008	2.36	518	-	-	-	518	31
NN0021	2.36	399	-	-	-	399	42
NN0023	2.82	677	-	377	-	584	33
NN0024	2.71	409	-	144	-	362	35
NN0025	2.54	473	-	292	-	446	35
NN0027	4.39	452	249	454	420	439	56
NN0030	2.36	546	239	254	-	419	41
NN0031	1.76	577	-	-	791	578	28
NN0032	3.50	435	-	334	-	420	42
NN0033	4.49	385	-	402	298	371	50
NN0036	3.04	610	-	243	401	454	43
NN0037	3.30	498	280	326	-	450	40
NN0038	3.46	533	290	-	329	429	43
NN0039	1.59	629	-	-	-	629	24
NN0040	3.72	414	304	493	308	373	52
NN0041	2.30	605	-	445	403	543	39
NN0042	2.50	342	-	351	630	363	39
NN0043	1.26	502	-	253	-	489	21
<b>Average</b>	<b>2.75</b>	<b>497</b>	<b>393</b>	<b>328</b>	<b>434</b>	<b>459</b>	<b>38</b>

Calculation of average price of silage, hay and other feed excludes zero values

**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	0.14	0.15	-	0.15	0.21	0.65	0.62	0.09	0.07
NN0003	0.13	0.34	0.26	0.34	0.09	1.16	1.34	-	0.30
NN0005	0.16	0.24	0.01	0.12	0.09	0.63	0.69	0.21	0.19
NN0007	0.12	0.09	-	0.11	0.21	0.54	0.20	0.25	0.03
NN0008	0.30	0.48	0.01	0.12	0.10	1.01	1.08	0.12	0.77
NN0021	0.03	0.44	0.02	0.18	0.15	0.82	0.69	0.17	0.23
NN0023	0.22	0.20	-	0.13	0.19	0.74	0.65	0.08	0.11
NN0024	0.13	0.23	0.03	0.09	0.20	0.69	0.95	0.03	0.35
NN0025	0.15	0.31	0.11	0.16	0.20	0.93	0.54	0.07	0.39
NN0027	0.10	0.25	0.02	0.09	0.14	0.61	0.74	0.10	0.05
NN0030	0.11	0.32	0.09	0.19	0.22	0.93	1.28	-	0.03
NN0031	0.17	0.07	0.13	0.23	0.18	0.79	0.83	0.00	0.05
NN0032	0.10	0.35	0.04	0.11	0.23	0.83	0.81	0.01	0.11
NN0033	0.03	0.24	0.00	0.25	0.13	0.66	0.10	-	0.32
NN0036	0.17	0.35	0.37	0.12	0.16	1.17	0.67	0.09	0.13
NN0037	0.26	0.22	-	0.15	0.07	0.70	0.53	-	0.01
NN0038	0.36	0.22	0.30	0.09	0.13	1.10	0.28	-	0.18
NN0039	0.17	0.19	0.19	0.11	0.14	0.79	0.46	-	0.02
NN0040	0.07	0.27	0.06	0.18	0.14	0.72	0.66	0.08	0.09
NN0041	0.13	0.23	0.39	0.15	0.15	1.05	0.46	0.22	0.38
NN0042	0.13	0.28	0.01	0.27	0.40	1.10	0.75	0.13	0.45
NN0043	0.16	0.06	0.05	0.18	0.05	0.52	0.26	0.09	0.05
<b>Average</b>	<b>0.15</b>	<b>0.25</b>	<b>0.09</b>	<b>0.16</b>	<b>0.16</b>	<b>0.82</b>	<b>0.66</b>	<b>0.08</b>	<b>0.20</b>

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	0.16	0.19	-	-	2.60	-	0.32	4.05	4.70
NN0003	0.20	1.74	-	-	2.79	0.09	(0.68)	5.79	6.95
NN0005	0.06	0.36	0.01	0.44	2.21	-	(0.28)	3.89	4.53
NN0007	0.08	0.20	-	0.28	1.94	0.16	0.09	3.19	3.74
NN0008	0.13	0.86	0.04	-	2.03	-	(0.49)	4.53	5.55
NN0021	0.26	0.43	-	-	2.10	0.43	0.38	4.69	5.51
NN0023	0.25	0.37	-	0.60	2.40	-	0.50	4.96	5.70
NN0024	0.13	0.35	-	0.13	2.01	-	(0.25)	3.70	4.38
NN0025	0.19	0.33	-	0.22	2.06	-	0.58	4.38	5.31
NN0027	0.12	0.46	-	0.55	2.82	-	0.23	5.07	5.68
NN0030	0.24	0.51	0.31	0.21	1.93	-	0.09	4.59	5.52
NN0031	0.31	0.51	-	-	2.35	-	0.58	4.64	5.43
NN0032	0.20	0.78	0.07	0.29	2.16	0.07	0.36	4.87	5.70
NN0033	0.53	0.16	0.01	0.34	3.40	-	0.57	5.43	6.09
NN0036	0.12	0.39	0.08	0.59	2.58	-	(0.07)	4.58	5.74
NN0037	0.10	0.24	0.01	0.54	2.34	-	0.09	3.87	4.57
NN0038	0.13	0.24	0.07	0.43	2.75	-	0.14	4.24	5.33
NN0039	0.12	0.18	0.00	-	1.93	-	(0.39)	2.33	3.12
NN0040	0.17	0.49	0.00	0.29	2.83	-	0.24	4.86	5.58
NN0041	0.14	0.30	-	0.31	2.96	-	(0.04)	4.74	5.79
NN0042	0.16	0.29	-	0.08	2.37	-	(0.06)	4.16	5.26
NN0043	0.08	0.67	-	0.04	1.52	-	(0.06)	2.64	3.16
<b>Average</b>	<b>0.18</b>	<b>0.46</b>	<b>0.03</b>	<b>0.24</b>	<b>2.37</b>	<b>0.03</b>	<b>0.08</b>	<b>4.33</b>	<b>5.15</b>

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	0.05	0.29	0.11	0.58	0.28	1.14	2.45	0.84	2.01	5.31
NN0003	0.07	0.10	0.05	0.85	0.39	1.87	3.33	0.18	0.93	4.44
NN0005	0.05	0.09	0.06	0.52	0.14	1.61	2.46	0.42	0.81	3.69
NN0007	0.04	0.16	0.03	0.59	0.11	0.69	1.62	0.32	1.11	3.05
NN0008	0.03	0.07	0.01	0.78	0.01	2.27	3.17	0.25	-	3.42
NN0021	0.07	0.24	0.02	0.40	0.20	0.68	1.61	0.66	1.61	3.88
NN0023	0.19	0.16	0.01	0.60	0.32	0.06	1.35	0.28	3.25	4.89
NN0024	0.05	0.10	0.02	0.58	0.23	1.61	2.60	0.35	0.70	3.64
NN0025	0.10	0.08	0.06	0.89	0.19	1.32	2.63	0.62	0.83	4.08
NN0027	0.06	0.10	0.06	0.63	0.32	1.37	2.54	0.48	0.78	3.80
NN0030	0.11	0.15	0.10	0.91	0.42	0.72	2.40	0.93	2.67	5.99
NN0031	0.03	0.05	0.01	0.25	0.02	0.96	1.32	0.42	0.94	2.68
NN0032	0.16	0.10	0.09	0.43	0.13	1.80	2.71	0.17	0.24	3.12
NN0033	0.10	0.12	0.07	0.54	0.21	2.27	3.31	0.52	0.34	4.17
NN0036	0.08	0.11	0.06	0.41	0.05	1.13	1.84	0.24	0.71	2.79
NN0037	0.06	0.10	0.08	0.31	0.19	1.92	2.65	0.38	1.12	4.15
NN0038	0.12	0.08	0.17	0.59	0.51	0.89	2.35	0.39	2.07	4.81
NN0039	0.08	0.06	0.04	0.33	0.19	0.04	0.73	0.40	1.82	2.95
NN0040	0.12	0.13	0.18	0.71	0.23	1.30	2.67	0.37	0.70	3.73
NN0041	0.06	0.15	0.11	0.87	0.26	0.54	1.99	0.31	1.98	4.28
NN0042	0.03	0.13	0.13	0.50	0.14	0.18	1.12	0.58	1.77	3.48
NN0043	-	0.05	0.05	0.64	0.37	1.29	2.41	0.10	0.85	3.36
<b>Average</b>	<b>0.07</b>	<b>0.12</b>	<b>0.07</b>	<b>0.59</b>	<b>0.22</b>	<b>1.17</b>	<b>2.24</b>	<b>0.42</b>	<b>1.24</b>	<b>3.90</b>



**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	1.4	1.5	0.0	1.5	2.1	6.5	6.2	0.9	0.7
NN0003	1.1	3.0	2.3	3.0	0.8	10.2	11.8	0.0	2.6
NN0005	1.9	2.9	0.1	1.5	1.1	7.7	8.4	2.6	2.3
NN0007	1.7	1.4	0.0	1.7	3.2	8.0	2.9	3.6	0.5
NN0008	3.3	5.4	0.1	1.3	1.1	11.3	12.0	1.3	8.6
NN0021	0.3	4.7	0.2	1.9	1.6	8.7	7.4	1.8	2.5
NN0023	2.1	1.9	0.0	1.3	1.8	7.0	6.2	0.8	1.1
NN0024	1.6	2.9	0.4	1.2	2.5	8.5	11.8	0.4	4.3
NN0025	1.6	3.3	1.2	1.7	2.2	9.9	5.7	0.7	4.2
NN0027	1.1	2.6	0.2	1.0	1.5	6.4	7.8	1.0	0.5
NN0030	1.0	2.8	0.8	1.7	1.9	8.1	11.1	0.0	0.2
NN0031	2.1	0.9	1.6	2.9	2.3	9.8	10.3	0.0	0.6
NN0032	1.1	4.0	0.5	1.3	2.6	9.4	9.2	0.1	1.3
NN0033	0.3	2.3	0.0	2.4	1.3	6.4	1.0	0.0	3.1
NN0036	2.0	4.1	4.3	1.4	1.9	13.7	7.9	1.0	1.5
NN0037	3.0	2.5	0.0	1.8	0.8	8.1	6.1	0.0	0.2
NN0038	3.6	2.1	2.9	0.9	1.3	10.8	2.8	0.0	1.8
NN0039	2.8	3.1	3.1	1.9	2.2	13.0	7.6	0.0	0.4
NN0040	0.7	2.9	0.6	1.9	1.5	7.7	7.1	0.9	1.0
NN0041	1.3	2.3	3.9	1.4	1.5	10.4	4.5	2.2	3.8
NN0042	1.5	3.2	0.2	3.1	4.6	12.6	8.6	1.5	5.1
NN0043	2.5	1.0	0.8	2.8	0.8	7.9	3.9	1.3	0.8
<b>Average</b>	<b>1.7</b>	<b>2.8</b>	<b>1.0</b>	<b>1.8</b>	<b>1.8</b>	<b>9.2</b>	<b>7.3</b>	<b>0.9</b>	<b>2.1</b>

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	1.6	1.9	0.0	0.0	26.0	0.0	3.2	40.5	46.9
NN0003	1.7	15.3	0.0	0.0	24.5	0.8	-6.0	50.8	61.0
NN0005	0.7	4.4	0.2	5.4	27.0	0.0	-3.4	47.4	55.1
NN0007	1.2	3.0	0.0	4.1	28.6	2.3	1.3	47.1	55.1
NN0008	1.4	9.6	0.4	0.0	22.7	0.0	-5.4	50.6	61.9
NN0021	2.7	4.6	0.0	0.0	22.3	4.6	4.1	50.0	58.7
NN0023	2.3	3.5	0.0	5.7	22.6	0.0	4.7	46.8	53.8
NN0024	1.6	4.4	0.0	1.6	25.1	0.0	-3.1	46.1	54.6
NN0025	2.0	3.5	0.0	2.4	22.0	0.0	6.2	46.6	56.5
NN0027	1.3	4.8	0.0	5.8	29.8	0.0	2.5	53.5	59.9
NN0030	2.1	4.4	2.7	1.8	16.7	0.0	0.8	39.8	47.9
NN0031	3.9	6.3	0.0	0.0	29.0	0.0	7.1	57.2	67.0
NN0032	2.3	8.9	0.8	3.3	24.5	0.8	4.1	55.2	64.6
NN0033	5.1	1.6	0.1	3.3	33.2	0.0	5.6	52.9	59.3
NN0036	1.4	4.5	0.9	6.9	30.3	0.0	-0.8	53.7	67.3
NN0037	1.1	2.7	0.1	6.2	26.9	0.0	1.0	44.3	52.4
NN0038	1.3	2.4	0.7	4.3	27.1	0.0	1.4	41.8	52.6
NN0039	1.9	3.0	0.0	0.0	31.8	0.0	-6.4	38.4	51.4
NN0040	1.8	5.2	0.0	3.1	30.4	0.0	2.6	52.2	59.9
NN0041	1.4	3.0	0.0	3.1	29.4	0.0	-0.4	47.1	57.5
NN0042	1.8	3.3	0.0	0.9	27.1	0.0	-0.7	47.6	60.2
NN0043	1.3	10.3	0.0	0.6	23.3	0.0	-1.0	40.5	48.4
<b>Average</b>	<b>1.9</b>	<b>5.0</b>	<b>0.3</b>	<b>2.7</b>	<b>26.4</b>	<b>0.4</b>	<b>0.8</b>	<b>47.7</b>	<b>56.9</b>

**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	0.5	2.9	1.1	5.8	2.8	11.4	24.5	8.4	20.1	53.1
NN0003	0.6	0.9	0.5	7.5	3.4	16.4	29.2	1.6	8.2	39.0
NN0005	0.6	1.1	0.7	6.3	1.7	19.6	30.0	5.1	9.8	44.9
NN0007	0.6	2.3	0.4	8.8	1.6	10.2	23.8	4.7	16.4	44.9
NN0008	0.3	0.7	0.2	8.7	0.1	25.3	35.4	2.8	0.0	38.1
NN0021	0.7	2.6	0.2	4.3	2.1	7.3	17.1	7.1	17.1	41.3
NN0023	1.8	1.5	0.1	5.7	3.1	0.5	12.7	2.7	30.7	46.2
NN0024	0.6	1.3	0.2	7.3	2.9	20.1	32.4	4.3	8.7	45.4
NN0025	1.0	0.8	0.6	9.5	2.0	14.0	28.0	6.7	8.8	43.5
NN0027	0.7	1.1	0.6	6.6	3.3	14.4	26.8	5.1	8.2	40.1
NN0030	0.9	1.3	0.9	7.9	3.6	6.2	20.8	8.0	23.2	52.1
NN0031	0.3	0.6	0.1	3.1	0.3	11.9	16.2	5.1	11.6	33.0
NN0032	1.9	1.1	1.1	4.9	1.5	20.4	30.8	1.9	2.7	35.4
NN0033	1.0	1.2	0.7	5.3	2.0	22.1	32.3	5.1	3.3	40.7
NN0036	0.9	1.3	0.6	4.9	0.6	13.3	21.5	2.8	8.4	32.7
NN0037	0.6	1.1	0.9	3.6	2.2	22.0	30.4	4.4	12.8	47.6
NN0038	1.1	0.7	1.7	5.9	5.0	8.7	23.2	3.8	20.4	47.4
NN0039	1.3	0.9	0.6	5.5	3.1	0.6	12.0	6.6	30.0	48.6
NN0040	1.3	1.4	1.9	7.6	2.5	13.9	28.6	3.9	7.5	40.1
NN0041	0.6	1.5	1.1	8.7	2.6	5.3	19.8	3.1	19.7	42.5
NN0042	0.4	1.4	1.5	5.8	1.7	2.1	12.8	6.7	20.3	39.8
NN0043	0.0	0.8	0.8	9.8	5.7	19.8	37.0	1.5	13.0	51.6
<b>Average</b>	<b>0.8</b>	<b>1.3</b>	<b>0.7</b>	<b>6.5</b>	<b>2.5</b>	<b>13.0</b>	<b>24.8</b>	<b>4.6</b>	<b>13.7</b>	<b>43.1</b>

**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	18,468	14,757	904	679	2,006	3,056	423	439	25,297
Liabilities				Equity					
Liabilities per usable hectare		Liabilities per milking cow		Equity per usable hectare			Average equity		
\$/ha		\$/cow		\$/ha			%		
Average		6,064		4,759			19,232	71	

Calculation of average values of land,water asset and equity excludes zero values

**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)
2011/12	7.13	8.44	8.04	9.52	0.35	0.41	0.29	0.35	3.17	3.76	3.81	4.51
2012/13	6.83	7.87	7.46	8.60	0.33	0.38	0.32	0.37	3.34	3.85	4	4.61
2013/14	7.17	8.04	8.01	8.99	0.30	0.33	0.37	0.42	3.68	4.13	4.35	4.88
2014/15	7.62	8.36	8.61	9.44	0.35	0.38	0.36	0.39	3.78	4.14	4.48	4.91
2015/16	7.65	8.28	8.46	9.16	0.34	0.37	0.31	0.34	3.61	3.90	4.26	4.61
2016/17	7.28	7.73	8.25	8.76	0.35	0.37	0.31	0.33	3.46	3.68	4.12	4.38
2017/18	7.62	7.94	8.39	8.75	0.38	0.40	0.33	0.34	4.09	4.26	4.79	4.99
2018/19	8.07	8.31	9.16	9.43	0.33	0.34	0.35	0.36	4.45	4.59	5.13	5.28
2019/20	9.37	9.53	10.35	10.52	0.43	0.44	0.32	0.32	4.91	4.99	5.65	5.75
2020/21	9.31	9.31	10.63	10.63	0.50	0.50	0.32	0.32	4.33	4.33	5.15	5.15
<b>Average</b>		<b>8.38</b>		<b>9.38</b>		<b>0.39</b>		<b>0.35</b>		<b>4.16</b>		<b>4.91</b>

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)		
2011/12	1.76	2.09	1.44	1.71	3.20	3.79	1.03	1.22	0.45	0.53	0.58	0.69	3.0%	2.2%
2012/13	2.01	2.32	1.26	1.45	3.25	3.74	0.22	0.25	0.58	0.67	-0.36	(0.41)	0.7%	-1.6%
2013/14	2.02	2.27	1.34	1.50	3.36	3.77	0.29	0.33	0.64	0.71	-0.34	(0.38)	0.8%	-1.7%
2014/15	1.87	2.05	1.45	1.59	3.31	3.63	0.82	0.90	0.63	0.69	0.19	0.21	1.9%	0.4%
2015/16	1.96	2.13	1.62	1.75	3.58	3.88	0.62	0.67	0.53	0.58	0.09	0.10	1.6%	-0.1%
2016/17	1.92	2.04	1.46	1.55	3.38	3.59	0.75	0.80	0.52	0.55	0.23	0.24	1.8%	0.8%
2017/18	1.86	1.94	1.61	1.68	3.46	3.61	0.13	0.14	0.46	0.48	-0.33	(0.34)	0.5%	-1.0%
2018/19	2.16	2.23	1.43	1.47	3.59	3.70	0.43	0.45	0.47	0.49	-0.04	(0.04)	1.1%	0.2%
2019/20	2.18	2.21	1.82	1.85	4.00	4.07	0.69	0.71	0.50	0.51	0.19	0.19	1.7%	0.9%
2020/21	2.24	2.24	1.66	1.66	3.90	3.90	1.59	1.59	0.53	0.53	1.06	1.06	3.3%	0.0%
<b>Average</b>		<b>2.15</b>		<b>1.62</b>		<b>3.77</b>		<b>0.70</b>		<b>0.57</b>		<b>0.13</b>	<b>1.6%</b>	<b>0.0%</b>

Note: 'Real' dollar values are the nominal values converted to 2020/21 dollar equivalents by the consumer price index (CPI) to allow for inflation. From 2016/17 Gross farm income does not include feed inventory changes and changes to the value of carry-over water. These are 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)
2011/12	250	109	0.45	300	1.3	461	598	5.90	1.8	62	307	364
2012/13	335	130	0.49	361	1.3	460	615	7.4	1.4	59	335	386
2013/14	231	102	0.59	272	1.2	471	590	5.8	1.2	60	444	498
2014/15	215	95	0.48	259	1.3	477	606	6.4	1.8	59	434	476
2015/16	210	95	0.53	289	1.4	463	636	5.9	2.3	52	401	434
2016/17	188	88	0.49	259	1.4	477	680	7.2	1.5	62	376	399
2017/18	188	94	0.60	288	1.5	459	698	7.1	1.6	57	442	461
2018/19	299	108	0.68	328	1.3	443	580	7.2	2.0	64	581	599
2019/20	314	106	0.50	309	1.2	472	579	6.0	2.3	55	586	596
2020/21	321	117	0.37	309	1.3	474	596	6.6	2.2	62	497	497
<b>Average</b>	<b>255</b>	<b>105</b>	<b>0.52</b>	<b>297</b>	<b>1.34</b>	<b>466</b>	<b>618</b>	<b>6.55</b>	<b>1.82</b>	<b>59</b>	<b>440</b>	<b>471</b>

\*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	8.87	1.30	10.17	4.20	3.15	57	2.81	3.6	0.75	7	2.06	6.0
SN0006	8.42	1.33	9.75	5.67	4.06	58	0.01	0.0	0.90	9	(0.88)	-4.7
SN0009	7.15	1.67	8.83	4.96	3.42	59	0.45	0.7	0.75	8	(0.30)	-0.6
SN0012	8.83	0.95	9.78	3.64	2.53	59	3.60	11.0	0.42	4	3.18	16.0
SN0014	7.29	1.10	8.39	3.64	2.00	65	2.74	11.8	0.37	4	2.37	16.7
SN0021	6.44	1.23	7.67	3.25	2.20	60	2.22	7.4	0.16	2	2.06	7.2
SN0022	9.21	0.54	9.75	3.05	2.02	60	4.69	7.1	0.70	7	3.98	10.9
SN0023	8.54	1.32	9.87	4.47	2.37	65	3.03	9.5	0.16	2	2.87	11.7
SN0024	8.88	0.72	9.60	3.97	2.21	64	3.42	5.6	0.76	8	2.66	18.7
SN0026	8.43	0.44	8.88	3.72	3.03	55	2.13	6.8	1.03	12	1.11	18.7
SN0028	7.65	0.61	8.27	4.00	1.65	71	2.62	14.2	0.06	1	2.56	19.1
SN0029	9.12	1.64	10.76	4.36	3.26	57	3.14	9.6	0.49	5	2.66	12.3
SN0031	9.85	0.37	10.22	3.64	3.25	53	3.34	9.0	0.39	4	2.96	13.5
SN0032	9.09	1.34	10.43	3.83	3.54	52	3.06	6.5	0.85	8	2.21	7.1
SN0033	7.51	1.41	8.92	2.68	3.20	46	3.05	7.5	1.01	11	2.04	34.5
SN0034	8.85	1.03	9.88	4.63	2.83	62	2.42	2.7	0.62	6	1.80	5.8
SN0036	7.65	0.99	8.64	3.27	3.34	50	2.04	7.6	0.36	4	1.68	8.1
SN0037	9.98	0.54	10.52	5.64	3.58	61	1.30	1.7	0.85	8	0.45	1.4
SN0038	9.84	0.99	10.83	3.98	3.13	56	3.72	4.1	1.01	9	2.71	7.1
<b>Average</b>	<b>8.51</b>	<b>1.03</b>	<b>9.53</b>	<b>4.03</b>	<b>2.88</b>	<b>58</b>	<b>2.62</b>	<b>6.7</b>	<b>0.61</b>	<b>6</b>	<b>2.01</b>	<b>11.0</b>

**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	303	95	0.3	354	1.2	583	682	3.9	3.3
SN0006	325	65	0.3	300	0.9	448	414	4.0	3.2
SN0009	280	3	0.3	268	1.0	520	497	4.0	3.3
SN0012	318	101	0.4	375	1.2	568	670	3.9	3.3
SN0014	536	185	1.2	400	0.7	712	532	4.5	3.4
SN0021	1,522	434	0.9	1,234	0.8	518	420	5.2	3.9
SN0022	870	240	0.3	910	1.0	446	467	4.3	3.4
SN0023	113	82	0.8	160	1.4	569	806	4.0	3.3
SN0024	269	140	0.3	270	1.0	582	584	4.0	3.3
SN0026	185	110	1.0	315	1.7	585	997	5.1	3.7
SN0028	748	748	1.0	966	1.3	696	899	4.4	3.5
SN0029	372	1	1.1	320	0.9	1,043	897	3.6	3.1
SN0031	655	1	0.6	522	0.8	588	469	4.0	3.3
SN0032	270	115	0.6	407	1.5	538	811	4.1	3.4
SN0033	450	250	0.3	300	0.7	513	342	4.0	3.3
SN0034	270	138	0.3	493	1.8	572	1,046	3.6	3.1
SN0036	190	125	0.5	345	1.8	485	880	4.0	3.3
SN0037	124	72	0.5	255	2.1	436	897	3.5	3.1
SN0038	103	63	0.6	210	2.0	584	1,190	3.7	3.1
<b>Average</b>	<b>416</b>	<b>156</b>	<b>0.6</b>	<b>442</b>	<b>1.3</b>	<b>578</b>	<b>710</b>	<b>4.1</b>	<b>3.3</b>

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	8.7	1.1	49	103	8	4	-	74	42,911
SN0006	6.7	5.6	55	117	18	72	5	62	27,885
SN0009	-	-	22	-	-	-	-	64	33,070
SN0012	3.3	2.6	33	237	57	-	16	81	46,014
SN0014	1.9	3.3	45	62	8	-	10	100	71,276
SN0021	5.4	0.7	71	291	9	-	5	117	60,738
SN0022	10.5	3.3	66	317	20	-	2	147	65,578
SN0023	5.1	4.5	56	224	38	-	47	90	51,507
SN0024	5.6	1.3	54	205	13	-	1	95	55,247
SN0026	5.3	4.9	51	103	0	1	0	70	40,912
SN0028	2.7	4.0	35	216	21	3	3	101	70,338
SN0029	0.0	-	66	-	-	-	-	38	39,522
SN0031	-	-	42	-	-	-	-	64	37,570
SN0032	8.2	0.8	64	265	11	93	58	90	48,651
SN0033	4.0	1.0	69	97	13	10	5	70	35,890
SN0034	6.3	1.3	45	205	9	72	28	71	40,877
SN0036	6.5	4.9	58	140	10	45	6	77	37,166
SN0037	7.6	0.4	44	221	22	29	22	78	34,166
SN0038	9.1	-	55	318	19	17	6	80	46,473
<b>Average</b>	<b>5.1</b>	<b>2.7</b>	<b>52</b>	<b>164</b>	<b>15</b>	<b>18</b>	<b>11</b>	<b>83</b>	<b>46,621</b>

\*on milking area

Calculation of the average for conserved feed excludes zero values



**Table C3** Purchased feed

Farm number	Purchased feed per milker	Concentrate price	Silage price	Hay price	Other feed price	Average purchased feed price	% of total energy imported
	t DM/hd	\$/t DM	\$/t DM	\$/t DM	\$/t DM	\$/t DM	% of ME
SN0002	4.57	394	-	307	-	373	51
SN0006	3.55	495	-	248	-	418	45
SN0009	6.11	410	220	277	-	334	78
SN0012							
SN0014	4.92	385	306	175	-	302	55
SN0021	1.77	333	-	-	390	341	29
SN0022	1.60	438	-	-	-	438	34
SN0023	3.06	500	-	154	-	398	44
SN0024	3.45	415	-	424	-	417	46
SN0026	3.72	373	318	-	476	382	49
SN0028	5.68	402	208	280	102	338	65
SN0029	4.12	477	-	-	-	477	34
SN0031	4.36	479	-	-	-	479	58
SN0032	2.90	351	116	308	206	302	36
SN0033	2.34	415	306	420	-	411	31
SN0034	4.32	344	267	353	378	345	55
SN0036	2.69	325	-	300	-	322	42
SN0037	4.24	482	-	378	-	440	56
SN0038	3.53	401	-	321	-	383	45
<b>Average</b>	<b>3.80</b>	<b>408</b>	<b>236</b>	<b>301</b>	<b>311</b>	<b>377</b>	<b>48</b>

Calculation of the average for conserved feed excludes zero values

**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	0.14	0.32	0.06	0.10	0.10	0.72	0.26	0.09	0.18
SN0006	0.13	0.23	-	0.17	0.07	0.60	0.47	0.05	0.24
SN0009	0.08	0.14	0.02	0.13	0.17	0.55	0.17	0.01	0.40
SN0012	0.08	0.15	0.01	0.18	0.05	0.48	0.19	0.18	0.09
SN0014	0.16	0.21	0.11	0.09	0.07	0.64	0.14	0.14	0.47
SN0021	0.07	0.08	0.03	0.11	0.05	0.34	0.55	0.94	0.77
SN0022	0.05	0.11	0.00	0.06	0.11	0.34	0.35	0.01	0.15
SN0023	0.07	0.05	-	0.14	0.16	0.42	0.64	0.09	0.50
SN0024	0.17	0.20	0.06	0.06	0.08	0.57	0.40	-	0.10
SN0026	0.08	0.23	0.08	0.15	0.11	0.65	0.09	0.09	0.36
SN0028	0.12	0.14	-	0.09	0.02	0.37	0.55	0.23	0.34
SN0029	0.13	0.15	-	0.20	0.33	0.82	0.25	0.18	0.51
SN0031	0.20	0.21	0.03	0.11	0.12	0.68	0.38	0.07	0.72
SN0032	0.19	0.22	0.03	0.17	0.12	0.73	0.46	0.02	0.46
SN0033	0.03	0.11	0.11	0.13	0.19	0.57	0.66	0.26	0.27
SN0034	0.14	0.28	0.15	0.13	0.11	0.82	0.41	0.01	0.36
SN0036	0.11	0.13	0.09	0.07	0.05	0.45	0.36	0.26	0.26
SN0037	0.07	0.13	0.01	0.13	0.15	0.50	0.32	-	0.13
SN0038	0.10	0.24	0.10	0.17	0.07	0.69	0.43	-	0.13
<b>Average</b>	<b>0.11</b>	<b>0.18</b>	<b>0.05</b>	<b>0.13</b>	<b>0.11</b>	<b>0.58</b>	<b>0.37</b>	<b>0.14</b>	<b>0.34</b>

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	0.10	0.05	-	0.55	2.25	-	0.02	3.49	4.20
SN0006	0.14	0.28	-	0.60	2.64	-	0.65	5.07	5.67
SN0009	0.17	0.20	0.00	0.71	3.02	-	(0.22)	4.41	4.96
SN0012	0.22	0.15	-	0.78	1.81	0.08	(0.34)	3.16	3.64
SN0014	0.13	0.21	-	0.78	1.94	0.08	(0.82)	3.01	3.64
SN0021	0.18	0.54	-	-	1.11	0.12	(1.35)	2.91	3.25
SN0022	0.12	0.54	-	-	1.54	0.06	(0.06)	2.71	3.05
SN0023	0.05	0.47	-	0.20	1.59	0.43	0.07	4.05	4.47
SN0024	0.07	0.34	-	0.57	1.88	0.07	(0.02)	3.40	3.97
SN0026	0.19	0.13	-	0.57	1.96	0.04	(0.36)	3.07	3.72
SN0028	0.08	0.21	-	0.64	1.90	-	(0.32)	3.63	4.00
SN0029	0.13	0.24	-	-	2.40	-	(0.20)	3.53	4.36
SN0031	0.14	0.26	-	-	2.48	-	(1.22)	2.96	3.64
SN0032	0.07	0.30	-	0.24	1.38	-	0.15	3.09	3.83
SN0033	0.16	0.20	-	0.28	1.73	-	(1.45)	2.10	2.68
SN0034	0.07	0.21	-	0.47	2.17	0.05	0.03	3.82	4.63
SN0036	0.09	0.23	-	0.26	1.59	0.32	(0.54)	2.82	3.27
SN0037	0.06	0.33	-	0.90	3.42	-	(0.02)	5.14	5.64
SN0038	0.13	0.31	-	0.45	1.92	0.06	(0.14)	3.29	3.98
<b>Average</b>	<b>0.12</b>	<b>0.27</b>	<b>0.00</b>	<b>0.42</b>	<b>2.04</b>	<b>0.07</b>	<b>(0.32)</b>	<b>3.46</b>	<b>4.03</b>

**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	0.10	0.06	0.08	0.28	0.19	-	0.71	0.66	1.79	3.15
SN0006	0.05	0.20	0.05	0.33	0.22	2.16	3.01	0.58	0.47	4.06
SN0009	0.06	0.10	0.05	0.48	0.23	1.10	2.02	0.35	1.05	3.42
SN0012	0.02	0.10	0.03	0.26	0.11	0.96	1.49	0.47	0.58	2.53
SN0014	0.03	0.09	0.01	0.49	0.12	0.60	1.34	0.24	0.42	2.00
SN0021	0.03	0.07	0.04	0.48	0.12	0.91	1.64	0.26	0.29	2.20
SN0022	0.04	0.09	0.04	0.42	0.04	0.83	1.46	0.27	0.29	2.02
SN0023	0.04	0.16	0.07	0.31	0.16	0.14	0.88	0.13	1.36	2.37
SN0024	0.07	0.09	0.03	0.22	0.13	0.59	1.13	0.34	0.73	2.21
SN0026	0.02	0.15	0.01	0.21	0.10	1.34	1.84	0.59	0.59	3.03
SN0028	0.01	0.05	0.01	0.43	0.09	0.79	1.37	0.18	0.09	1.65
SN0029	0.03	0.11	0.02	0.41	0.13	1.74	2.44	0.50	0.32	3.26
SN0031	0.02	0.10	0.05	0.45	0.19	1.14	1.95	0.47	0.82	3.25
SN0032	0.12	0.10	0.06	0.62	0.09	2.08	3.08	0.46	-	3.54
SN0033	-	0.04	0.01	0.58	0.17	0.96	1.76	0.42	1.02	3.20
SN0034	0.03	0.06	0.13	0.41	0.17	1.72	2.52	0.20	0.11	2.83
SN0036	0.08	0.08	0.03	0.79	0.11	1.23	2.33	0.32	0.69	3.34
SN0037	0.13	0.11	0.07	0.84	0.12	0.96	2.23	0.25	1.10	3.58
SN0038	0.07	0.11	0.06	0.69	0.14	0.64	1.71	0.46	0.97	3.13
<b>Average</b>	<b>0.05</b>	<b>0.10</b>	<b>0.04</b>	<b>0.46</b>	<b>0.14</b>	<b>1.05</b>	<b>1.84</b>	<b>0.38</b>	<b>0.67</b>	<b>2.88</b>



**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	1.9	4.3	0.8	1.4	1.4	9.7	3.5	1.2	2.4
SN0006	1.3	2.4	0.0	1.7	0.7	6.1	4.8	0.5	2.5
SN0009	1.0	1.6	0.3	1.5	2.1	6.5	2.0	0.2	4.8
SN0012	1.2	2.5	0.2	3.0	0.9	7.8	3.1	2.9	1.5
SN0014	2.8	3.7	1.9	1.7	1.3	11.3	2.5	2.6	8.3
SN0021	1.3	1.4	0.6	2.0	0.9	6.3	10.1	17.3	14.1
SN0022	1.0	2.2	0.1	1.2	2.2	6.7	6.9	0.2	2.9
SN0023	1.0	0.7	0.0	2.0	2.4	6.1	9.4	1.4	7.3
SN0024	2.8	3.2	0.9	1.0	1.3	9.2	6.5	0.0	1.6
SN0026	1.1	3.4	1.3	2.3	1.6	9.6	1.4	1.3	5.3
SN0028	2.1	2.4	0.0	1.6	0.4	6.5	9.7	4.1	6.0
SN0029	1.7	2.0	0.0	2.7	4.4	10.8	3.2	2.4	6.7
SN0031	2.9	3.1	0.4	1.6	1.8	9.9	5.6	1.1	10.5
SN0032	2.6	3.0	0.4	2.3	1.6	9.9	6.3	0.2	6.3
SN0033	0.4	1.9	1.9	2.2	3.2	9.7	11.3	4.4	4.6
SN0034	1.9	3.7	2.0	1.8	1.5	10.9	5.5	0.2	4.8
SN0036	1.6	1.9	1.4	1.1	0.8	6.8	5.5	4.0	3.9
SN0037	0.8	1.5	0.1	1.5	1.7	5.4	3.5	0.0	1.5
SN0038	1.5	3.4	1.5	2.4	1.0	9.7	6.1	0.0	1.8
<b>Average</b>	<b>1.6</b>	<b>2.5</b>	<b>0.7</b>	<b>1.8</b>	<b>1.6</b>	<b>8.4</b>	<b>5.6</b>	<b>2.3</b>	<b>5.1</b>

Farm number	Fuel and oil	Pasture improvement/cropping	Other feed costs	Fodder purchases	Grain/concentrates/other	Agistment costs	Feed and water inventory change	Total feed costs	Total variable costs
	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs	% of costs
SN0002	1.4	0.6	0.0	7.5	30.5	0.0	0.3	47.4	57.1
SN0006	1.4	2.9	0.0	6.2	27.1	0.0	6.7	52.1	58.3
SN0009	2.0	2.4	0.0	8.4	36.1	0.0	-2.6	52.6	59.1
SN0012	3.6	2.4	0.0	12.6	29.4	1.3	-5.6	51.2	59.0
SN0014	2.2	3.8	0.0	13.8	34.4	1.4	-14.4	53.2	64.5
SN0021	3.2	9.9	0.0	0.0	20.3	2.1	-24.7	53.3	59.6
SN0022	2.3	10.7	0.0	0.0	30.5	1.1	-1.2	53.5	60.2
SN0023	0.7	6.9	0.0	3.0	23.3	6.3	1.0	59.2	65.4
SN0024	1.1	5.5	0.0	9.2	30.4	1.1	-0.3	55.0	64.2
SN0026	2.8	2.0	0.0	8.4	29.0	0.6	-5.3	45.5	55.1
SN0028	1.5	3.7	0.0	11.3	33.7	0.0	-5.7	64.3	70.8
SN0029	1.8	3.2	0.0	0.0	31.5	0.0	-2.6	46.4	57.2
SN0031	2.0	3.7	0.0	0.0	36.0	0.0	-17.7	43.0	52.8
SN0032	1.0	4.1	0.0	3.3	18.7	0.0	2.0	42.0	51.9
SN0033	2.7	3.4	0.0	4.7	29.4	0.0	-24.7	35.8	45.6
SN0034	0.9	2.9	0.0	6.2	29.1	0.7	0.4	51.2	62.1
SN0036	1.4	3.5	0.0	3.9	24.0	4.8	-8.2	42.7	49.5
SN0037	0.6	3.6	0.0	9.7	37.1	0.0	-0.2	55.7	61.2
SN0038	1.9	4.4	0.0	6.3	27.0	0.8	-1.9	46.3	56.0
<b>Average</b>	<b>1.8</b>	<b>4.2</b>	<b>0.0</b>	<b>6.0</b>	<b>29.3</b>	<b>1.1</b>	<b>-5.5</b>	<b>50.0</b>	<b>58.4</b>

**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	1.3	0.8	1.1	3.8	2.6	0.0	9.6	8.9	24.3	42.9
SN0006	0.5	2.1	0.5	3.4	2.2	22.2	30.9	6.0	4.8	41.7
SN0009	0.7	1.2	0.6	5.7	2.7	13.1	24.1	4.1	12.6	40.9
SN0012	0.4	1.7	0.5	4.2	1.8	15.6	24.1	7.6	9.3	41.0
SN0014	0.4	1.5	0.2	8.8	2.2	10.6	23.8	4.2	7.5	35.5
SN0021	0.6	1.2	0.7	8.8	2.2	16.7	30.2	4.8	5.4	40.4
SN0022	0.7	1.7	0.7	8.3	0.8	16.5	28.7	5.3	5.7	39.8
SN0023	0.5	2.3	1.1	4.5	2.4	2.1	12.8	1.9	19.9	34.6
SN0024	1.1	1.5	0.5	3.5	2.1	9.6	18.3	5.5	11.9	35.8
SN0026	0.3	2.3	0.1	3.2	1.5	19.9	27.3	8.8	8.8	44.9
SN0028	0.2	0.8	0.2	7.5	1.5	14.0	24.3	3.2	1.7	29.2
SN0029	0.3	1.5	0.3	5.4	1.7	22.9	32.0	6.6	4.2	42.8
SN0031	0.3	1.5	0.7	6.6	2.7	16.5	28.4	6.9	11.9	47.2
SN0032	1.6	1.4	0.8	8.4	1.3	28.3	41.8	6.3	0.0	48.1
SN0033	0.0	0.7	0.1	9.8	3.0	16.3	29.9	7.2	17.3	54.4
SN0034	0.4	0.8	1.7	5.5	2.3	23.0	33.7	2.7	1.5	37.9
SN0036	1.2	1.3	0.5	11.9	1.7	18.7	35.2	4.9	10.4	50.5
SN0037	1.4	1.2	0.7	9.1	1.4	10.4	24.2	2.7	11.9	38.8
SN0038	1.0	1.5	0.8	9.7	2.0	9.0	24.0	6.4	13.6	44.0
<b>Average</b>	<b>0.7</b>	<b>1.4</b>	<b>0.6</b>	<b>6.7</b>	<b>2.0</b>	<b>15.0</b>	<b>26.5</b>	<b>5.5</b>	<b>9.6</b>	<b>41.6</b>

**Table C8** Capital structure

Farm assets					Other farm assets (per usable hectare)				
Land value	Land value	Permanent water value	Permanent water value		Plant and equipment	Livestock	Hay and grain	Other assets	Total assets
\$/ha	\$/cow	\$/ha	\$/cow		\$/ha	\$/ha	\$/ha	\$/ha	\$/ha
Average	17,318	13,075	1,787	1,772	1,990	3,026	495	432	25,049
Liabilities					Equity				
Liabilities per usable hectare		Liabilities per milking cow			Equity per usable hectare				Average equity
\$/ha		\$/cow			\$/ha				%
Average		7,537			17,512				69

Calculation of average values of land, water asset and equity excludes zero values

**Table C9** Historical data – average farm income, costs and profit per kilogram of milk solids

Income					Variable costs							
Milk income (net)		Gross farm income			Herd costs		Shed costs		Feed costs		Total variable costs	
Year	Nominal (\$ kg/MS)	Real (\$ kg/MS)	Nominal (\$ kg/MS)	Real (\$ kg/MS)	Nominal (\$ kg/MS)	Real (\$ kg/MS)	Nominal (\$ kg/MS)	Real (\$ kg/MS)	Nominal (\$ kg/MS)	Real (\$ kg/MS)	Nominal (\$ kg/MS)	Real (\$ kg/MS)
2011/12	6.64	7.86	7.48	8.86	0.31	0.37	0.25	0.29	2.86	3.39	3.42	4.05
2012/13	6.03	6.95	6.95	8.01	0.32	0.37	0.24	0.28	3.01	3.47	3.57	4.11
2013/14	7.12	7.99	7.98	8.95	0.32	0.36	0.21	0.24	3.20	3.59	3.73	4.18
2014/15	7.28	7.98	8.25	9.05	0.30	0.32	0.21	0.23	3.28	3.60	3.79	4.16
2015/16	6.97	7.55	7.94	8.60	0.35	0.38	0.21	0.23	3.01	3.26	3.57	3.86
2016/17	6.48	6.89	7.62	8.10	0.40	0.43	0.22	0.23	3.07	3.26	3.68	3.91
2017/18	6.81	7.10	7.49	7.81	0.34	0.36	0.23	0.23	3.63	3.78	4.20	4.38
2018/19	7.37	7.59	8.14	8.39	0.30	0.31	0.26	0.27	4.54	4.67	5.10	5.25
2019/20	8.36	8.51	9.32	9.47	0.31	0.31	0.24	0.24	4.67	4.75	5.22	5.30
2020/21	8.51	8.51	9.53	9.53	0.33	0.33	0.24	0.24	3.46	3.46	4.03	4.03
<b>Average</b>		<b>7.69</b>		<b>8.68</b>		<b>0.35</b>		<b>0.25</b>		<b>3.72</b>		<b>4.32</b>

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)	Return on total assets	Return on equity		
2011/12	1.35	1.60	1.05	1.24	2.40	2.84	1.66	1.97	0.73	0.86	0.93	1.11	5.5	4.9
2012/13	1.44	1.66	1.12	1.29	2.56	2.95	0.82	0.94	0.66	0.76	0.16	0.19	2.7	0.5
2013/14	1.54	1.73	1.16	1.30	2.70	3.03	1.55	1.74	0.61	0.69	0.94	1.05	4.8	4.7
2014/15	1.52	1.67	1.02	1.12	2.54	2.79	1.92	2.11	0.56	0.61	1.36	1.50	5.3	5.7
2015/16	1.49	1.61	1.17	1.27	2.66	2.88	1.71	1.85	0.55	0.60	1.16	1.26	4.7	4.7
2016/17	1.67	1.77	1.16	1.23	2.83	3.01	1.11	1.18	0.51	0.54	0.60	0.64	2.7	2.1
2017/18	1.49	1.55	1.22	1.27	2.71	2.83	0.58	0.60	0.58	0.61	0.00	(0.00)	2.1	0.6
2018/19	1.55	1.60	1.19	1.22	2.74	2.82	0.31	0.32	0.61	0.63	-0.30	(0.31)	0.3	-2.1
2019/20	1.78	1.81	0.89	0.91	2.67	2.72	1.43	1.45	0.68	0.70	0.74	0.76	0.3	-2.1
2020/21	1.84	1.84	1.05	1.05	2.88	2.88	2.62	2.62	0.61	0.61	2.01	2.01	0.3	-2.1
<b>Average</b>		<b>1.68</b>		<b>1.19</b>		<b>2.87</b>		<b>1.48</b>		<b>0.66</b>		<b>0.82</b>	<b>2.9</b>	<b>1.7</b>

Note: 'Real' dollar values are the nominal values converted to 2020/21 dollar equivalents by the consumer price index (CPI) to allow for inflation. From 2016/17 Gross farm income does not include feed inventory changes and changes to the value of carry-over water. These are included in feed costs.

**Table C10** Historical data – average farm physical information

	Total usable area	Milking area	Total water use efficiency	Number of milking cows	Milking cows per useable area	Milk sold	Milk sold	Estimated grazed pasture*	Estimated conserved feed*	Home grown feed as % of ME consumed	Concentrate price	
Year	ha	ha	t DM/100mm/ha	hd	hd/ha	kg MS/cow	kg MS/ha	t DM/ha	t DM/ha	% of ME	Nominal (\$/t DM)	Real (\$/t DM)
2011/12	351	156	0.54	450	1.5	495	728	6.8	0.9	52	301	357
2012/13	323	151	0.61	337	1.1	523	601	6.5	1.2	55	311	358
2013/14	381	139	0.60	350	1.0	541	546	6.2	1.0	54	377	423
2014/15	372	165	0.56	430	1.1	540	597	6.7	1.8	57	389	427
2015/16	379	164	0.57	425	1.1	552	597	6.5	1.9	57	382	414
2016/17	343	153	0.63	396	1.2	520	611	6.5	1.7	57	336	357
2017/18	333	149	0.75	401	1.3	526	665	5.6	1.6	55	398	415
2018/19	390	184	0.80	424	1.2	546	643	5.3	1.6	56	552	569
2019/20	419	181	0.65	463	1.2	555	673	4.8	1.3	57	522	530
2020/21	416	156	0.59	442	1.3	578	710	5.1	2.7	52	408	408
<b>Average</b>	<b>371</b>	<b>160</b>	<b>0.63</b>	<b>412</b>	<b>1.20</b>	<b>538</b>	<b>637</b>	<b>6.00</b>	<b>1.56</b>	<b>55</b>	<b>398</b>	<b>426</b>

\*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"> <li>• Cash cost of production; variable costs plus cash overhead costs</li> <li>• Cost of production excluding inventory changes; variable costs plus cash and non-cash overhead costs</li> <li>• 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</li> </ul>	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 <sub>4</sub>	Methane gas
CO <sub>2</sub>	Carbon dioxide gas
CO <sub>2</sub> -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 <sub>2</sub> 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</i> than
Q3	Third quartile, i.e. the value of which one quarter, or 25%, of data in that range is <i>greater</i> than
RoTA	Return on total assets
RoE	Return on equity
t	Tonne = 1,000kg
Top 25%	The state average for the top 25% of farms ranked by return on total assets.

## 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
2018/19 heifers	1,200	1,600
2019/20 heifers	600	1,200
2020/21 calves		600
Mature bulls	2,400	2,400

### Imputed owner/operator and family labour

In 2020/21 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.



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