

DAIRY FARM MONITOR PROJECT

TASMANIA ANNUAL REPORT 2018–19



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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
- Tasmania overview
- Business confidence survey
- Historical analysis
- Appendices

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

The report presents visual descriptions of data for the 2018–19 year. Data are presented for individual farms, as state financial averages and for the state top 25% of farms ranked by return on total assets managed (RoTA). The presented averages should not be considered averages for the population of farms in Tasmania due to the small sample size and farms not being randomly selected.

The top 25% of farms are presented as lighter coloured bars. Return on assets managed is the determinate used to identify the top 25% of producers as it provides an assessment of whole farm performance irrespective of differences in location and production system.

In this report, the top 25% consists of eight farms from 32 participants in the 2018–19 Tasmanian Dairy Farm Monitor Project.

WHAT'S NEW IN 2018–19?

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

- Fertiliser application rates are now reported on the milking area as compared with the usable area in previous years.

The Q1–Q3 data range for key indicators are presented to provide an indication of 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.

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

Milk production data are presented in kilograms of milk solids (fat + protein) as farmers are paid based on milk solids production.

The report focuses on measures on a per kilogram of milk solids basis, with occasional reference to measures on a per hectare or per cow basis. The appendix tables contain the majority of financial information on a per kilogram of milk solids basis.

Percentage differences are calculated as [(new value – original value)/original value]. For example 'costs went from \$80/ha to \$120/ha, a 50% increase'; $\frac{((120-80)/80) \times (100/1)}{1} = \frac{(40/80) \times 100}{1} = 0.5 \times 100 = 50\%$, unless otherwise stated.

Any reference to 'last year' refers to the 2017–18 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 2017–18 are in the 2018–19 report, as there were 8 farms from the previous year that did not participate and 6 new participants in this year's dataset. It is important to bear this in mind when comparing datasets between years.

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

- Average data do not include zero values for the indicators given below. A note to this effect is also given in the Appendix Tables.
 - Silage, hay and other feed values (\$/t)
 - Land values
 - Water asset values
 - Equity values.

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

Summary



Milk income was higher in 2018–19 but a higher cost of production resulted in a decrease in Return on Total Assets and Net Farm Income.

This is the sixth year of the Dairy Farm Monitor Project in Tasmania. The project aims to provide the Tasmanian dairy industry with valuable farm level data relating to profitability and production.

In 2018–19, 32 Tasmanian dairy farms participated in the Dairy Farm Monitor Project, the same number as the previous year. The average milk income of these participants was \$6.16, a 3.5% increase compared to the previous season.

Earnings before interest and tax (EBIT) averaged \$468,542 per farm, a 5.1% decrease on the previous year. Return on total assets (RoTA) decreased from 6.3% to 5.2%, a 17.5% decrease from 2017–18. The top 25% of farms (as measured by RoTA) had a RoTA of 10.5%.

In 2017–18 all participants had a positive RoTA. In 2018–19, three participants had a negative RoTA. There was a wider range of RoTA in 2018–19, from -1.9% to 15.5%.

Net farm income, calculated after interest and lease charges were deducted from EBIT, was on average \$317,530 per farm, a 12% decrease from last year.

Six out of the 32 farms recorded a negative return on equity (RoE). The average RoE was 6.5% and 21.1% for the top 25% performers. For the second year in a row, there was a slight increase in equity from 62% to 64%. There was an increase in debt service ratio from 9% to 10%.

Cost of production without inventory change increased from \$5.04/kg MS to \$5.49/kg MS, an increase of 9%.

Milk income of the top 25% was only 0.6% higher than average at \$6.20/kg MS and gross farm income was 1% lower than average. However EBIT for the top 25% was

58% higher than average at \$2.27/kg MS compared to \$1.44/kg MS. The variable costs of the top 25% were 2% lower at \$3.20/kg MS than the average at \$3.27/kg MS. The top 25% performers spent 38% less on overhead costs at \$1.36/kg MS than the average at \$2.19/kg MS.

Milk production decreased on both a per cow basis and per hectare basis. Milk sold per hectare decreased from 1031 kg MS/ha to 947 kg MS/ha and milk sold per cow decreased from 445 kg MS/cow to 418 kg MS/cow. The top performers sold 14 % more milk per cow and 50% more milk per hectare.

Stocking rate, measured as cows per usable hectare decreased slightly from 2.3 cows/ha in 2017–18 to 2.2 cows/ha in 2018–19. Farms in the top 25% had a higher stocking rate than average at 2.9 cows/ha, an increase from 2.8 cows/ha.

Average milk fat was 4.6% and milk protein was 3.6%, both the same as in 2017–18.

Average homegrown feed consumption was 11.2 t DM/ha on the milking area forming an estimated 72% of the diet.

The majority (81%) of participants expect farm business returns to improve in 2019–20. The majority (92%) also expect milk price to increase or remain stable for 2019–20. All participants expect milk production to increase or remain stable.

Milk price and input prices continue to be ranked as the most important issues facing the dairy industry both in the immediate and longer term future.

Farm Monitor Method



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

The method employed to generate the profitability and production data was adapted from that described in *The Farming Game* (Malcolm et al. 2005) and is consistent with previous Dairy Farm Monitor Project (DFMP) reports. Readers should be aware that not all benchmarking programs use the same method or terms for farm financial reporting. The allocation of items such as lease costs, overhead costs or imputed labour costs against the farm enterprises varies between financial benchmarking programs. Standard dollar values for items such as stock and feed on hand and imputed labour rates may also vary. For this reason, the results from different benchmarking programs should be compared with caution.

Figure 1 Dairy Farm Monitor Project method

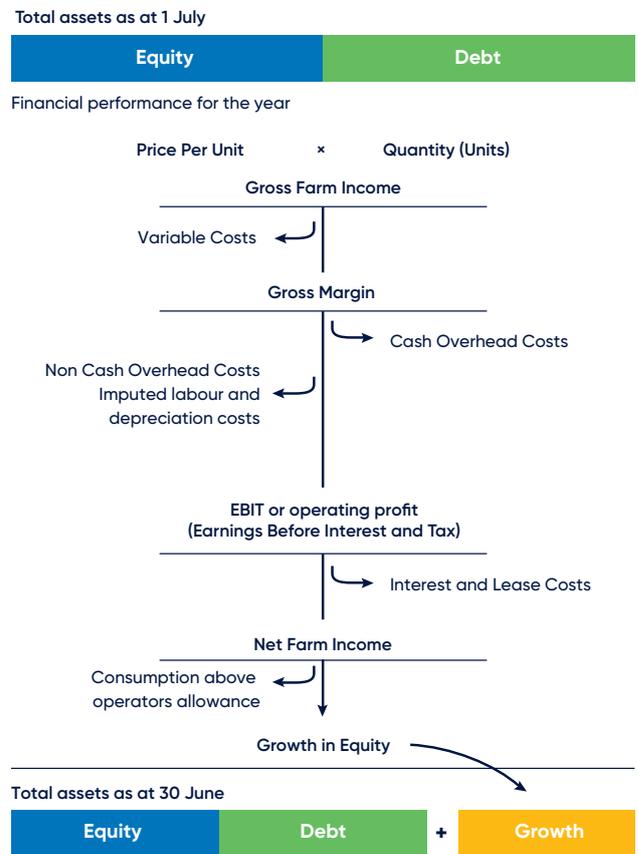


Figure 1 demonstrates how the different farm business economic terms fit together and are calculated. This has been adapted from an initial diagram developed by Bill Malcolm. The diagram shows the different profitability measures as costs are deducted from gross farm income. Growth is achieved by investing in assets which generate income. These assets can be owned with equity (one's own capital) or debt (borrowed capital). The amount of growth is dependent on the maximisation of income and minimisation of costs, or cost efficiency relative to income generation.

The performance of all participants in the project using this method is shown in Figure 2. Production and economic data are both displayed to indicate how the terms are calculated and how they in turn fit together.

Gross farm income

The farming business generates a gross farm income which is the sum of milk cash income (net), livestock trading profit and other sources such as milk share dividends. The main source of income is from milk, which is calculated by multiplying price received per unit by the number of units. For example, dollars per kilogram milk solids multiplied by kilograms of milk solids sold. Subtracting certain costs from total income gives different profitability measures.

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

Earnings before interest and tax (EBIT) is calculated by subtracting variable and overhead costs from gross farm income. Earnings before interest and tax is sometimes referred to as operating profit and is the return from all the capital used in the business.

Net farm income

Earnings before interest and tax (EBIT) is calculated by subtracting variable and overhead costs from gross farm income. Earnings before interest and tax is sometimes referred to as operating profit and is the return from all the capital used in the business

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

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

Return on total assets and return on equity

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

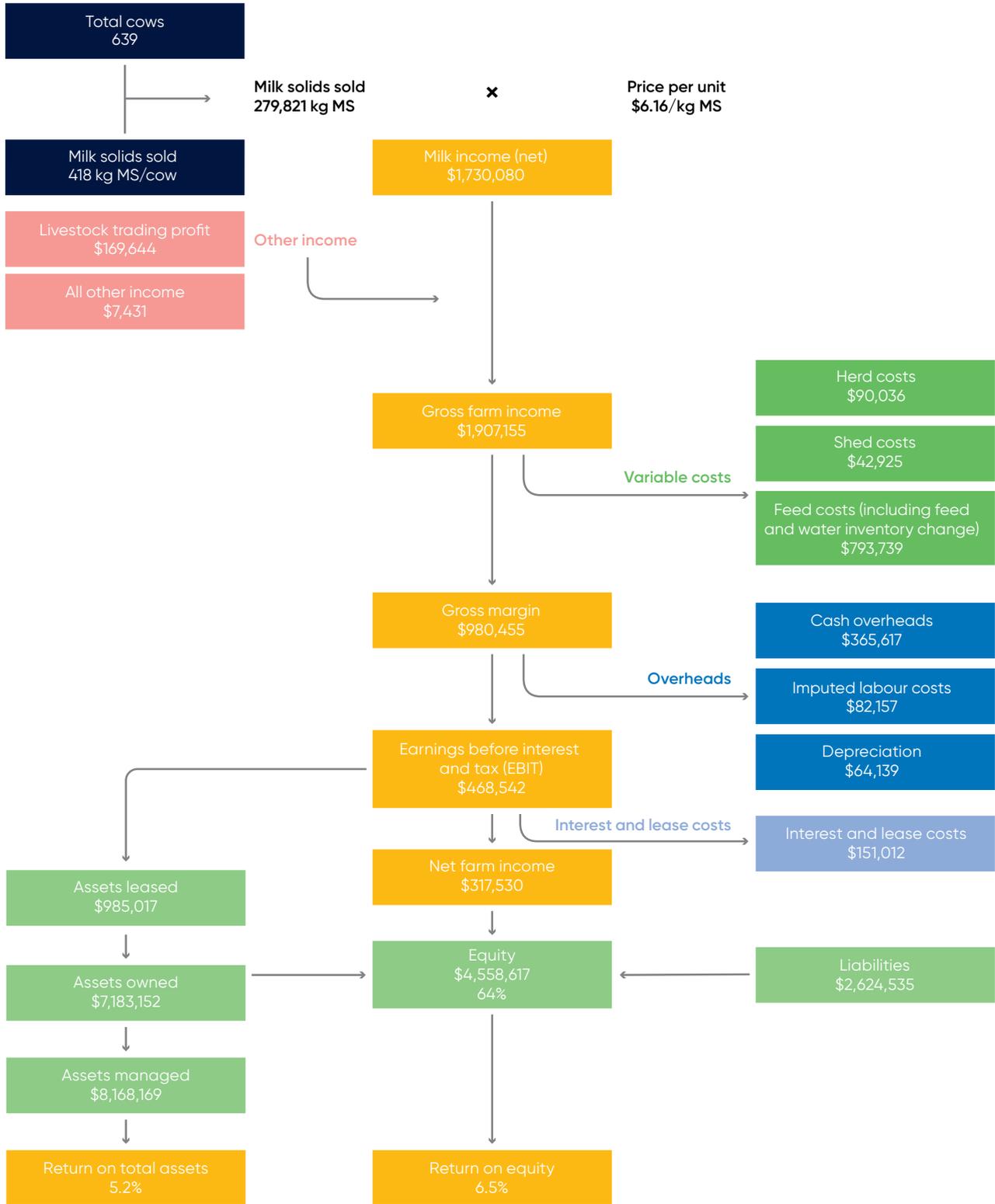
Return on total assets indicates the overall earning of the total farm assets, irrespective of the capital structure of the business. It is EBIT expressed as a percentage of the total assets under management in the farm business, including the value of leased assets. Return on total assets is sometimes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

Earnings before interest and tax expressed as a return on total assets is the return from farming. There is also a further return to the asset from any increase in the value of the assets over the year, such as land value. If land value goes up 5% over the year, this is added to the return from farming to give total return to the investment. This return to total assets can be compared with the performance of alternative investments with similar risk in the economy. In Figure 1, total assets are visually represented by debt and equity. The debt: equity ratio or equity percent of total capital varies depending on the detail of individual farm business and the situation of the owners, including their attitude towards risk.

Return on equity measures the owner's rate of return on their own capital investment in the business. It is net farm income expressed as a percentage of total equity (one's own capital). The DFMP reports RoE without capital appreciation. The RoE is reported in Appendix Table A1.

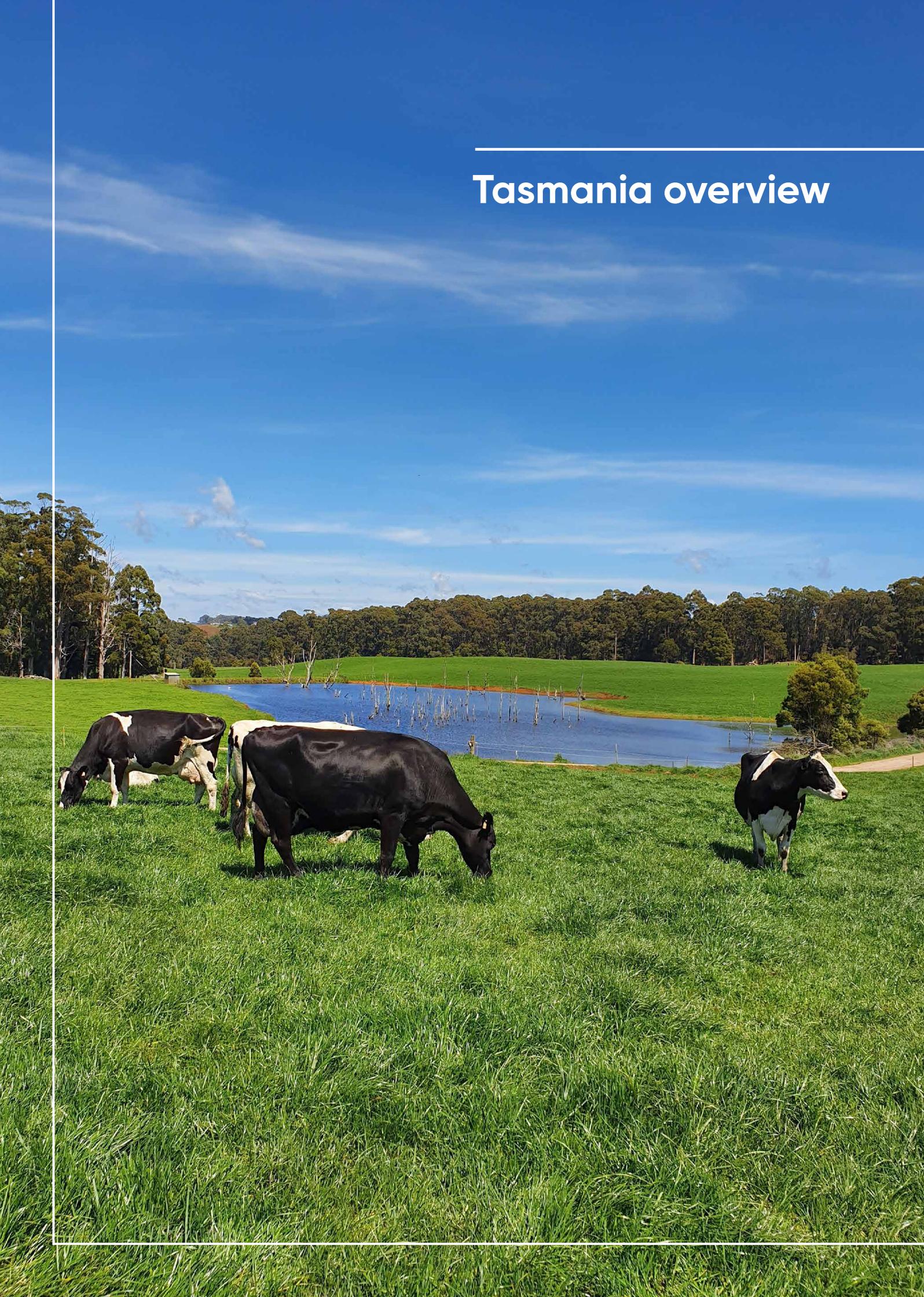
Figure 2 Dairy Farm Monitor Project method profit map – state average 2018–19 data*

All 32 farms



* Profit map adapted from Queensland Dairy Accounting Scheme – 2010 with permission from Ray Murphy, Department of Agriculture, Fisheries and Forestry, Queensland

Tasmania overview



In 2018–19, 910 million litres of milk was sold in Tasmania. This was a small decrease from the record 913 million litres in 2017–18.

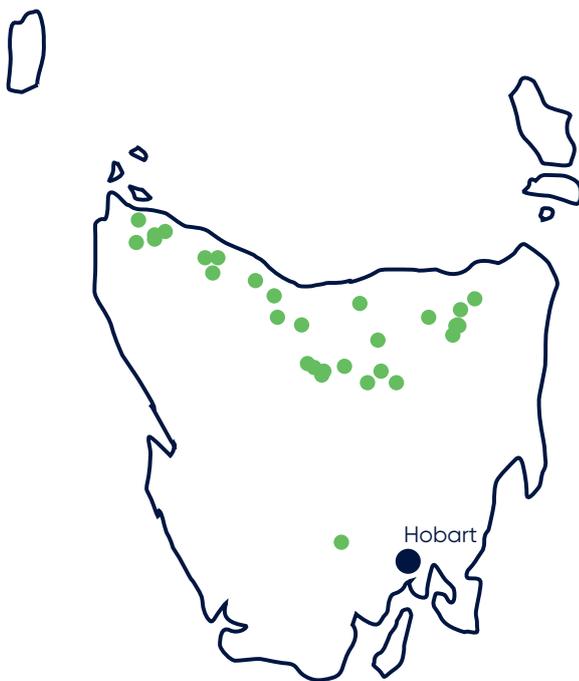
The number of registered dairy farms in Tasmania this year was 404, a decrease from 412 in 2017–18. The majority of farms are located in the higher rainfall (>1000 mm) regions of Tasmania along the northern coastline from Marrawah in the west to Pyengana in the east. There are a small number of farms on King Island and in the lower rainfall regions of the northern midlands and southern Tasmania.

Tasmania has a ryegrass dominant, pasture-based dairy industry with feeding systems ranging from very low input to high input systems. Peak pasture growth occurs in spring, and for many farms this accounts for two-thirds of pasture growth for the season. Rainfall in Tasmania tends to be winter dominant.

Tasmania retains a seasonally based calving pattern with the majority of cows calved in spring. Many Tasmanian dairy farms now use cross-breeding in their herds.

Thirty-two farms provided data for the 2018–19 Tasmanian Dairy Farm Monitor report, 26 of these farms had participated in previous years with 6 being new participants to the project. The approximate locations of the participating farms are shown in Figure 3.

Figure 3 Distribution of participant farms in 2018–19 across Tasmania



SEASONAL CONDITIONS

Rainfall for the 2018–19 season was close to average for most regions in the state. There was a significant lower than average rainfall period at the start of summer.

Winter conditions at the start of the season were wet in the west with the temperature relatively mild state-wide. Spring dried-off quickly, and with the forecast likelihood of a dry summer, adjustments were made to feed plans in preparation. Silage and hay yields were impacted by the drier than average spring. Rainfall in January provided welcome relief to farmers. Follow-up rain through autumn provided good conditions for growing pasture and helped with milk production through the latter part of the season.

Figure 4 shows the variability in rainfall received by farms participating in the Dairy Farm Monitor Project. It also shows that most farms received below average rainfall for the season. However the above average rainfall in autumn (Figure 5) and the timing of that rainfall resulted in very good pasture growth through autumn which helped hold milk production and ultimately resulted in a record amount of milk being produced.

Figure 4 Monthly average rainfall (individual farms)

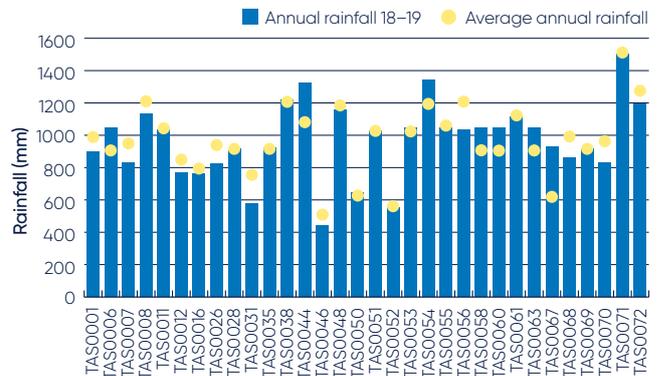


Figure 5 Monthly average rainfall (All farms)



WHOLE FARM ANALYSIS

Thirty-two farms provided data for the Tasmanian Dairy Farm Monitor Project in 2018–19. The participating farms had an average herd size of 639 cows with an average stocking rate of 2.2 cows per usable hectare. Key whole farm physical parameters for Tasmania are presented below in Table 1.

The average herd size of participating farms was 639 cows. This is higher than the actual state average.

Rainfall was 8% higher in 2018–19 compared to the previous year. Total water use efficiency, a measure of the tonnes (DM) of feed grown on the farm per 100 mm of rainfall or irrigation water received was similar at 0.8 t DM/100mm/ha.

The average total usable area increased from 289 ha to 305 ha. Milking cows per usable hectares was 2.2 cows/ha this year, a decrease from 2.3 cows/ha last year. Milk sold per cow was 6% lower than the previous season. Milk sold per hectare was 8% lower.

The percentage of metabolisable energy (ME) being derived from homegrown feed was 5% higher this season compared to 2017–18.

Labour efficiency per cow has decreased marginally from 154 cows/FTE to 152 cows/FTE. This is the first time in six years there has been a decrease in this measure. Labour efficiency measured as kg MS/FTE also decreased slightly this season. Labour efficiency on Tasmanian dairy farms continues to be the highest of all states participating in the DFMP.

Table 1 presents the average and range of some farm physical characteristics for the state. Further details can be found in the Appendix Table A2.

The physical characteristics of the top 25% farms only partly explained their ability to be more profitable. Caution must be taken when looking at the physical parameters in isolation.

There are eight farms in the top 25% this season. They have a significantly higher herd size (30%) than the Tasmanian average but a lower useable area resulting in a higher stocking rate. Per cow milk production is 14% higher and per hectare milk production is 50% higher. For the second consecutive season, the amount of energy coming from homegrown feed is slightly lower for the top 25%.

Labour efficiency is significantly higher on the top 25% farms and increased for both measures unlike the average).

Table 1 Farm physical data

Farm physical parameters	State average	Q1 to Q3 range	Top 25 per cent average
Annual rainfall 18–19 (mm)	969	830–1,062	885
Herd size	639	362–900	833
Total water use efficiency (t DM/100mm/ha)	0.8	0.7–1.0	1.1
Total usable area (ha)	305	186–429	288
Milking cows per usable hectares	2.2	1.6–2.9	2.9
Milk sold (kg MS/cow)	418	343–480	478
Milk sold (kg MS/ha)	947	607–1,258	1,417
Home grown feed as a per cent of ME consumed	76%	69%–82%	74%
Labour efficiency (cow/FTE)	152	126–195	181
Labour efficiency (kg MS/FTE)	63,775	47,938–83,350	85,239

Gross farm income

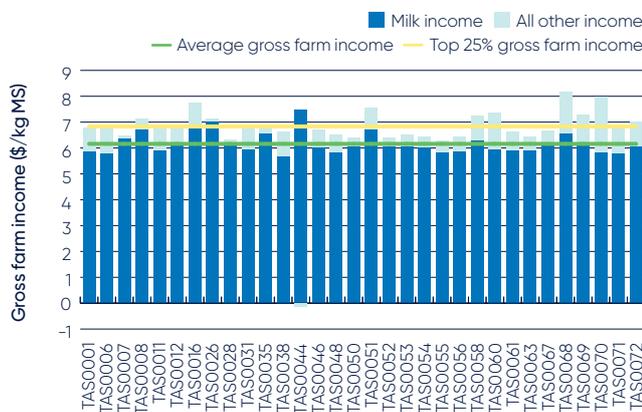
Gross farm income is inclusive of all farm incomes. It includes income from milk sales, livestock trading profit, milk factory shares and other farm income.

Figure 6 shows how milk income dominates gross farm income, forming 89.3% of gross farm income in 2018–19. Other income consists of livestock trading profit (10.0%) and other farm income (0.6%). This is very similar to last season.

Figure 6 also shows the variation in gross income per kilogram of milk solids from \$6.29/kg MS to \$8.15/kg MS. Average gross farm income was \$6.90/kg MS, a 3% increase from last year. The top 25% of farms decreased by 1% from \$6.90/kg MS to \$6.83/kg MS which is a lower gross farm income than the average. This is mainly due to a \$0.09/kg MS lower livestock trading profit and \$0.01/kg MS lower other farm income. While the livestock trading profit for the participant average only decreased by 4% this season, the livestock trading profit for the top 25% was 30% lower this season compared to last season.

The increase in average gross farm income in 2018–19 was reflective of the higher milk price received that year. On average, milk price increased by 4%, from \$5.95/kg MS in 2017–18 to \$6.16/kg MS this year. The top 25% received a milk price of \$6.20/kg MS.

Figure 6 Gross farm income of per kilogram of milk solids

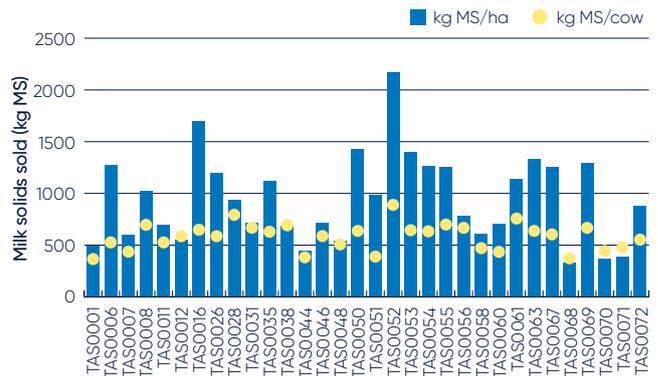


Milk solids sold

The average amount of milk solids sold was 8% lower at 947 kg MS/ha compared to 1031 kg MS/ha in 2017–18 (Figure 7). The top 25% sold an average of 1,417 kg MS/ha, 50% higher than the average of all participants. As can be seen in Figure 7, there is wide variation in the amount of milk solids sold per usable hectare, ranging from 332 kg MS/ha to 2,172 kg MS/ha. Some of this variation is due to strategies employed by different farmers in managing non-milking stock. Milk solids sold per hectare is calculated on the total dairy area which includes the support area, and because of this, farms which utilise their whole farm as milking area and use agistment for non-milking animals tend to have higher milk solids sold per hectare.

There is also a wide range of milk sold per cow, from 263 kg MS/cow to 640 kg MS/cow. This has widened for the past two years. The average milk production per cow is 418 kg MS/cow.

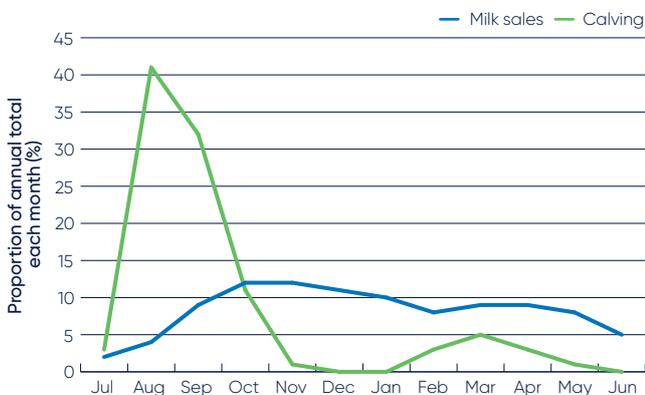
Figure 7 Milk solids sold per hectare



Milk sales versus calving pattern

Figure 8 shows the average monthly milk sales for all participant farms with the monthly distribution of calves born. Tasmanian farms have spring dominant calving patterns, with 88% of calves born between July and November. Milk sales are generally higher three months after peak calving. This year, peak milk sales occurred in October and November with 12% of the annual total in each month. There was another small peak in March (9% of annual total) and April (9% of annual total) due to autumn calving cows. All of these statistics are exactly the same as 2017–18.

Figure 8 Milk sales vs calving pattern



Variable costs

Variable costs are costs that change directly according to the amount of output and are measured in cost per kilogram of milk solids. Variable costs include herd, shed and feed costs.

The average variable costs of the participant farms were 11% higher than last year. This increase was all due to feed costs, with both homegrown and purchased feed costs increasing. Herd costs and shed costs were the same as the previous season.

Figure 9 shows the range of variable costs from \$1.88/kg MS to \$4.41/kg MS, with an average of \$3.27/kg MS.

Total feed costs, including home grown feed, purchased feed, agistment and feed inventory change, accounted for 85% of total variable costs.

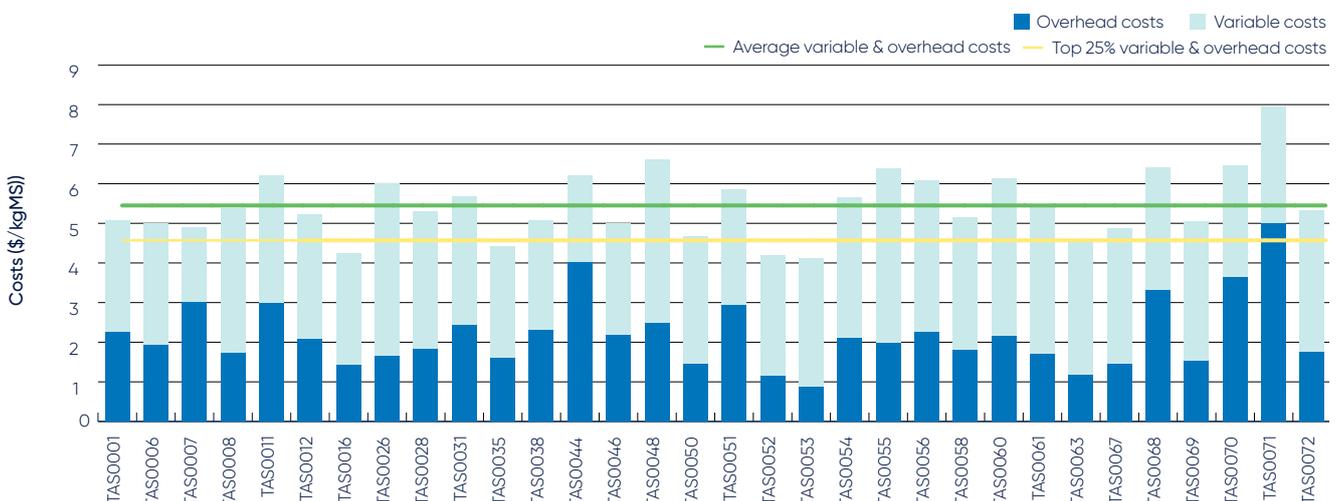
Concentrates were the largest single feed cost category, costing farmers an average of \$1.31/kg MS in 2018–19, a 16% increase from the previous year.

Fertiliser (\$0.47/kg MS) and agistment (\$0.25/kg MS) are the next largest variable costs – consistent with the previous season.

Variable costs for the top 25% were 2% lower than average at \$3.20/kg MS. This was a 24% increase from the previous season. Last season, the main area which the top 25% spent less on was concentrates, this year the top 25% spent the same amount. The main areas in which the top 25% spent less than the average were fertiliser (-\$0.08/kg MS); irrigation (-\$0.06/kg MS); hay and silage making (-\$0.06/kg MS); fuel and oil (-\$0.06/kg MS); and pasture improvement and cropping (-\$0.06/kg MS). Similar to last year, the top 25% spent significantly more than average on agistment (\$0.27/kg MS).

Appendix Table A4 shows the variable costs per kilogram of milk solids sold and the percentage breakdown can be found in Appendix Table A6.

Figure 9 Whole farm variable and overhead costs per kilogram of milk solids



Overhead costs

Overhead costs are those that do not vary with the level of production. The Dairy Farm Monitor Project includes cash overheads such as rates and insurance as well as non-cash costs such as imputed owner/operator and family labour and depreciation of plant and equipment.

Figure 9 illustrates the overhead cost per kilogram of milk solids. This includes the cash overhead costs and non-cash overhead costs (for imputed owner/operator and family labour and depreciation).

The average overhead cost for 2018–19 was \$2.19/kg MS compared with \$2.09/kg MS in 2017–18. The range of overhead costs during 2018–19 was between \$0.88/kg MS and \$4.99/kg MS.

Labour costs were on average \$1.28/kg MS which was an increase from \$1.17/kg MS in the previous year. Employed labour continues to be the largest component of labour costs at \$0.73/kg MS which was the same as the previous year. After a significant decrease last year, imputed labour increased 16%, from \$0.44/kg MS to \$0.55/kg MS. This is back to the same cost in 2016–17 which was \$0.55/kg MS.

The ability to maintain lower overhead costs appears to be a key to performing in the top 25% for Tasmania. The top 25% have overhead costs that are 38% lower than average at \$1.36/kg MS.

The top 25% have cash overhead costs of \$1.13/kg MS compared to the average of \$1.35/kg MS. The largest component of this difference in 2018/19 is in the other overheads category where the top 25% spend \$0.09/kg MS less than the average. The top 25% also spend \$0.08/kg MS less on repairs and maintenance

The top 25% also spent less on non-cash overhead costs. The imputed labour cost was \$0.48/kg MS and depreciation was \$0.13/kg MS lower. The lower depreciation is a result of the top 25% having less assets per kilogram of milk solids produced than the average farm.

Table 2 provides an indication of the range of overheads per kilogram of milk solids sold. The breakdown of overhead costs can be found in Appendix Table A5 and Appendix Table A7.

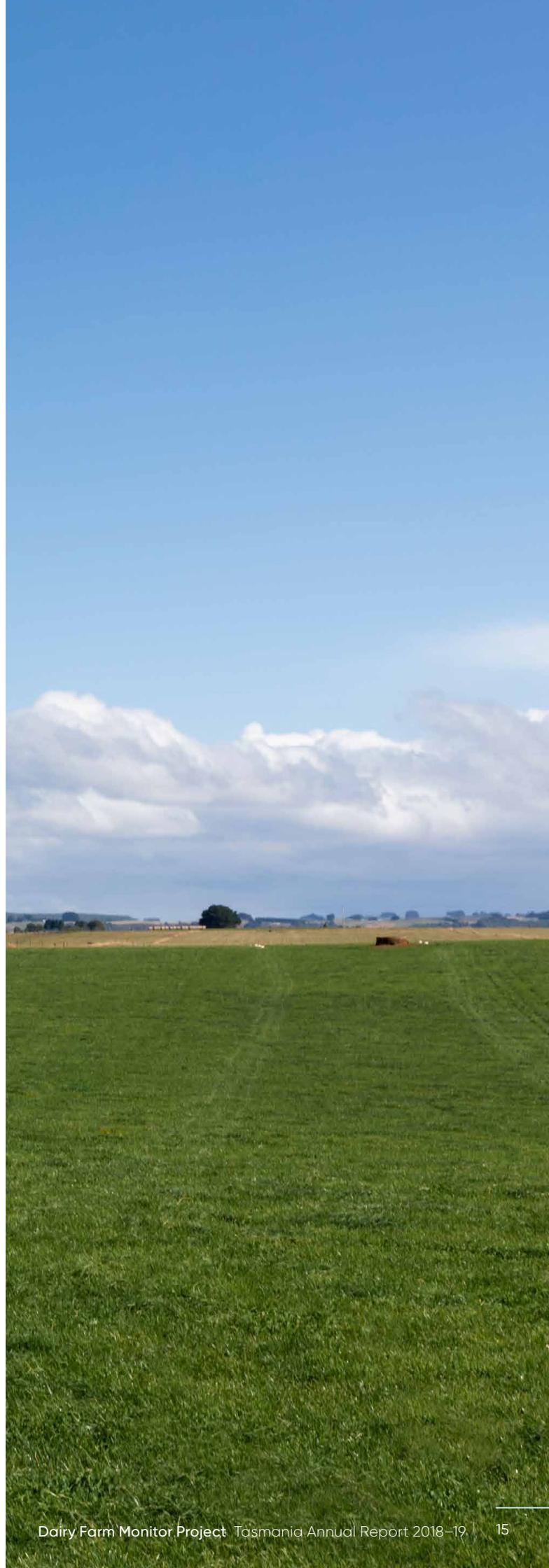


Table 2 Total variable and overhead costs

Farm income and cost category	Average	Q1 to Q3 range	Top 25 per cent average
Income	\$ kg/MS	\$ kg/MS	\$ kg/MS
Milk income (net)	6.16	5.87–6.31	6.20
Livestock trading profit	0.69	0.40–0.94	0.60
Other farm income	0.04	0–0.05	0.02
Total income	6.90	6.52–7.18	6.83
Variable costs			
Herd cost	0.30	0.23–0.35	0.34
Shed cost	0.18	0.14–0.20	0.14
Home grown feed cost	1.09	0.85–1.23	0.77
Purchased feed and agistment	1.73	1.36–2.20	1.96
Feed inventory change	-0.04	-0.12–0.07	-0.01
Water inventory change	0.00	0–0	0.00
Total feed costs	2.78	2.47–3.11	2.72
Total variable costs	3.27	2.90–3.57	3.20
Gross margin	3.63	3.15–3.91	3.63
Overhead costs			
Employed labour	0.73	0.58–0.92	0.71
Repairs and maintenance	0.36	0.31–0.40	0.28
All other overheads	0.26	0.15–0.33	0.14
Imputed labour	0.55	0.04–0.85	0.07
Depreciation	0.29	0.14–0.40	0.16
Total overhead costs	2.19	1.65–2.44	1.36
Variable and overhead costs	5.45	4.97–6.08	4.57
Earnings before interest and tax	\$1.44	1.14–1.78	2.27

Table 3 Cost of production

Farm costs (\$/kgMS)	Average	Q1 to Q3 range	Top 25 per cent average
Cash cost of production	4.65	4.19–5.09	4.34
Cost of production (excl inventory changes)	5.49	5.00–6.02	4.57
Inventory change			
+/- feed and water inventory changes	-0.04	-0.12–0.07	-0.01
+/- livestock inventory changes minus purchases	-0.03	-0.35–0.36	-0.14
Cost of production (incl inventory changes)	5.42	4.57–6.21	4.43

Cost of production

Cost of production gives an indication of the average cost of producing a kilogram of milk solids. It is calculated as variable plus overhead costs and also accounts for changes in fodder inventory and livestock trading losses. Including changes in fodder inventory is important to establish the true costs to the business. The changes in fodder inventory account for the net cost of feed from what was fed out, conserved, purchased and stored over the year. Livestock trading loss is also considered in the cost of production where there is a net livestock depreciation or reduced stock numbers.

Table 3 shows the average cost of production was \$5.42/kg MS, which was an 12% increase from last year. The top 25% of farms increased their cost of production by 17% from \$3.78/kg MS to \$4.43/kg MS.

Earnings before interest and tax

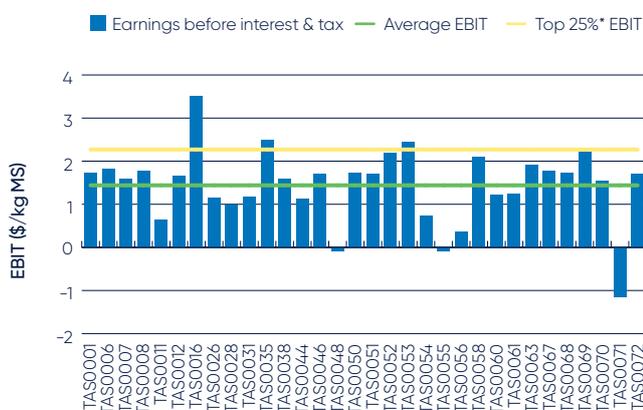
Earnings before interest and tax (EBIT) is the gross farm income less variable and overhead costs. As EBIT excludes interest and lease costs, it is a valuable measure of operating profit.

This season the average EBIT decreased from \$1.69/kg MS to \$1.44/kg MS. This was despite a higher milk price. The decrease in EBIT was due to higher total operating costs.

The EBIT of the top 25% was \$2.27/kg MS, a 14% decrease from \$2.65/kg MS in 2017–18. There was a further increase in the difference between the average EBIT and the top 25% EBIT in 2018–19 to \$0.83/kg MS.

Twenty-nine of the thirty-two participants had a positive EBIT in 2018–19 (Figure 10).

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



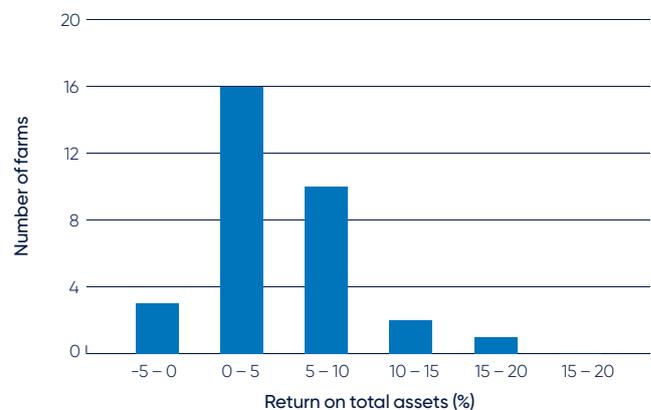
Return on total assets and equity

Return on total assets (RoTA) is the EBIT expressed as a percentage of total assets under management. It is an indicator of the overall earning power of total assets, irrespective of capital structure.

Figures 11 to 14 were calculated excluding capital appreciation.

The average return on total assets for 2018–19 was 5.2% with a range from -1.9% to 15.5% (Figure 11 and Appendix Table A1).

Figure 11 Distribution of farms by return on total assets



The average RoTA of 5.2% was a decrease from 6.3% last year. The top 25% have a higher RoTA than average at 10.5% but this was also a decrease, from 11.5% in 2017–18.

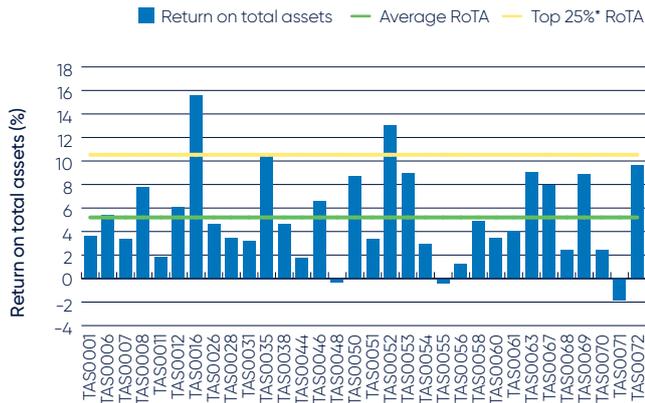
The average per hectare owned asset value this year has decreased from \$26,396/ha to \$24,227/ha. This decrease was also reflected in the total assets managed.

The top 25% have a lower owned asset value of \$21,551/ha, a decrease from \$30,844/ha.

However the average per farm total farm assets owned has increased from \$7,003,385 in 2017–18 to \$7,183,152 in 2018–19.

The variation between each farm's return on total assets (Figure 12) is indicative of the variation between farms' EBIT generated from the assets under management. An asset's ability to generate a profit for one owner/manager over another is identifiable where farms generate a similar EBIT, but manage total assets of a different value.

Figure 12 Return on total assets



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

A RoTA becomes a lesser return on equity when the rate of interest on loans or lease on leased capital is greater than the return from the additional assets managed. A negative return on equity will result when total interest and lease payments exceed EBIT. When the percentage of RoE increases compared to RoTA, it is the result of a higher return from the additional assets than the interest or lease rate.

The average RoE for the 32 farms was 6.5%, a decrease from 6.7% in 2017–18. The average RoE is higher than RoTA.

Figure 13 Distribution of farms by return on equity



Six farms out of the 32 had a negative RoE (Figure 13 and Figure 14). This is twice as many with a negative RoE as in the previous year.

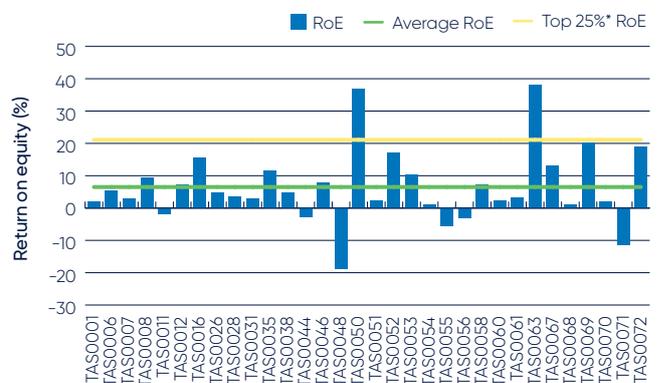
The top 25% group recorded a RoE of 21.1%, a large increase from 11.5% in the previous year.

Average interest and lease costs were higher at \$0.66/kg MS than the previous year at \$0.60/kg MS.

Average capital values can be seen in Appendix A8.

Further discussion of return on total assets and return on equity occur in the risk section below. Appendix Table A1 presents the return on total assets and return on equity for all the participant farms

Figure 14 Return on equity



Risk

"Risk is conventionally classified into two types: business risk and financial risk. Business risk is the risk any business faces regardless of how it is financed. It comes from production and price risk, uncertainty and variability. 'Business risk' refers to variable yields of crops, reproduction rates, disease outbreaks, climatic variability, unexpected changes in markets and prices, fluctuations in inflation and interest rates, and personal mishap.... 'Financial risk' derives from the proportion of other people's money that is used in the business relative to the proportion of owner-operator's capital..."².

Table 4 presents some key risk indicators. Refer to Appendix B for the definition of terms used in Table 4. The indicators in Table 4 can also be found in Appendix Tables A1, A3 and A8.

Exposure to risk in business is entirely rational if not unavoidable. It is through managing risk that greater profits can be made. It is also the case that by accepting a level of risk in one area of business, a greater risk in another area can be avoided. Using the example of feed sources, dairy farmers are generally better at dairy farming than they are at grain production. Thus by allowing someone who is experienced in producing grain to supply them, they lessen the production and other business risks as well as the financial risks they would have exposed themselves to by including extensive cropping in their own business. The trade-off is that they are in turn exposed to price and supply risks.

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

The higher the risk indicator (or lower with equity %) in Table 4, the greater the exposure to the risk of a shock in those areas of the business.

The cost structure ratio provides variable costs as a proportion of total costs. A lower ratio implies that overhead costs comprised a greater proportion of total costs that in turn indicates less flexibility in the business. Table 4 shows that across Tasmania for every \$1.00 spent, \$0.61 was used to cover variable costs. One hundred minus this gives the proportion of total costs that are overhead costs.

The debt services ratio shows interest and lease costs as a proportion of gross farm income. The ratio stayed at 9% this year. This indicates that on average farms repaid \$0.09 to their creditors from every dollar of gross farm income.

The benefit of taking on risk and borrowing money can be seen when farm incomes yield a higher return on equity than on return on assets. This year there were 15 out of the 32 (or 47%) participants who achieved a higher return on equity than return on total assets compared to 53% last year.

In 2018–19, the equity percentage was 64%, a 3% increase from 2017–18.

All farms in the Dairy Farm Monitor project sourced some of their metabolisable energy (ME) from imported feeds and are therefore somewhat exposed to fluctuations in prices and supply in the feed market. This year the amount of imported feed decreased slightly to 24% of the total ME of the diet

Table 4 Risk indicators – statewide

	2013–14	2014–15	2015–16	2016–17	2017–18	2018–19
Cost structure (percentage of total costs as variable costs)	59	62	63	60	59	61
Debt service ratio (percentage of income as finance costs)	6	6	10	11	9	10
Debt per cow	\$2,660	\$2,601	\$3,141	\$4,313	\$4,479	\$4,314
Equity percentage (ownership of total assets managed)	75	74	70	61	62	64
Percentage of feed imported (as a percentage of total ME)	28	31	31	26	29	24

² 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

Grazed pasture provided an average of 68% of the total metabolisable energy (ME) on participant farms this year. Concentrates supplied 20% of metabolisable energy.

Feed consumption

Pasture consumption is calculated as the gap between the total energy required on farm for all livestock classes and the energy provided from concentrates, silage, hay and other sources. A further description of the Energetics method used to calculate energy sources and feed consumption can be found in the Appendix B.

The contribution of different feed sources to the total ME consumed on the farm is presented in Figure 15. This includes feed consumed by dry cows and young stock. A cow's diet can consist of grazed pasture, harvested forage, crops, concentrates and other imported feeds.

Grazed pasture made up the majority of the diet with an average of 68% of the diet derived from directly grazed pasture.

The next biggest component of energy in the diet is concentrates at 20%, followed by silage at 7% and hay at 5%.

The percentage of ME supplied by concentrates ranged from 0% to 35%.

Appendix Table A3 provides further information on purchased feed.

Figure 15 Sources of whole farm metabolisable energy

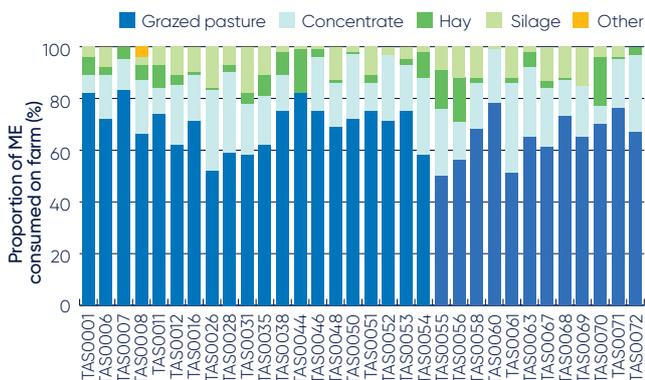


Figure 16 and Appendix Table A2 give an estimate of the average quantity for home grown feed consumed per milking hectare for participant farms across the state. It accounts only for the consumption of pasture that occurred on the milking area whether by milking, dry or young stock.

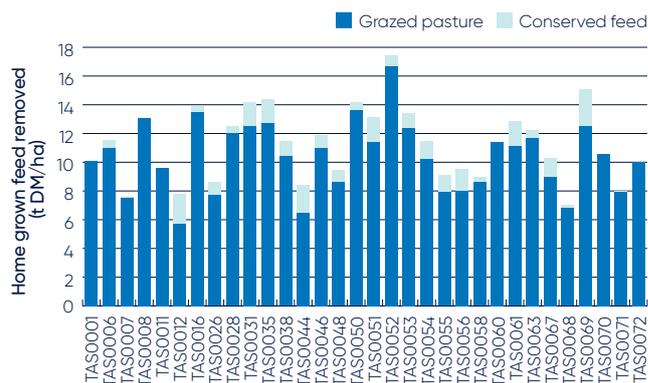
Average pasture production in 2018–19 was 11.2 t DM/ha consisting of 10.4 t DM/ha grazed pasture and 0.9 t DM/ha conserved pasture. This is an increase in pasture consumption of 0.6 t DM/ha from 2017–18.

The top 25% achieved average pasture production of 13.8 t DM/ha, consisting of 12.9 t DM/ha grazed pasture and 0.9 t DM conserved pasture. This was an increase in pasture produced of 0.8 t DM/ha from the previous year.

The amount of homegrown conserved fodder produced was higher this year than the previous year.

Both Figures 15 and 16 were estimated using the pasture consumption calculator in DairyBase. This involves a calculation based on the total ME required on the farm, live weight, average distance stock walk to and from the dairy and milk production. Metabolised energy imported from other feed sources is subtracted from the total farm ME requirements over the year to estimate the total consumed on farm, divided into grazed and conserved feed depending on the quantity of fodder production recorded.

Figure 16 Estimated tonnes of home grown feed consumed per milking hectare



Fertiliser application

Table 5 shows the average application rates of nitrogen, phosphorus, potassium and sulphur per hectare for participants in the DFMP over the past six seasons.

The total amount of nutrients applied this year was 290 kg/milking ha, similar to the previous year. 192 kg N/ha was applied in 2018–19, slightly less than the previous two seasons. Typically there has not been much variation in the amount of non-nitrogen fertiliser applied between the different years but in 2018–19, the amount of phosphorus applied increased by 9 kg/ha. Potassium application was the same as the previous year and sulphur application decreased by 3 kg S/ha to 20 kg S/ha.

Farms in the top 25% (based on return on total assets) applied 65 kg/ha more of nitrogen, 9 kg/ha less of phosphorus, 7 kg/ha more of potassium and 7 kg/ha less of sulphur. The amount of phosphorus applied by the top 25% was 28 kg P/ha which was the same as the amount applied in 2017–18 by both the average and top 25%. That is, while the average phosphorus application for participants increased, there was no change in the amount of phosphorus applied by the top 25%.

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

Appendix Table A2 provides further information on fertiliser application.

Table 5 Fertiliser application per hectare

Applied fertiliser	2013–14	2014–15	2015–16	2016–17	2017–18	2018–19
Nitrogen kg/ha	152	177	179	202	201	192
Phosphorus kg/ha	27	27	27	24	28	37
Potassium kg/ha	35	43	40	46	42	42
Sulphur kg/ha	21	20	20	19	23	20

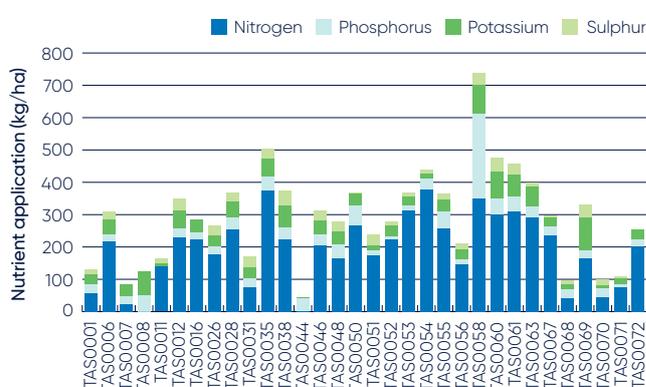
Participant farms in Tasmania used a wide range of fertilisers and fertiliser application rates (Figure 17).

Nitrogen was the main nutrient applied by participant farms, varying from 0 kg/ha up to 376 kg/ha. The maximum amount of nitrogen applied per hectare was 122 kg N/ha lower than in 2017–18.

One farm out of the 32 participants did not use any nitrogen with another farm only applying an average of 2 kg N/ha.

All farms applied phosphorus and potassium fertiliser. Five farms did not apply any sulphur in 2018–19.

Figure 17 Fertiliser application (kg/ha)



Business confidence survey



Expectations and issues

Responses to this business confidence survey were made in August to October 2019 with regard to the 2019–20 financial year and the next five years to 2023–24. Twenty-seven farms provided responses to the business confidence survey.

Expectations for business returns

Most participants are expecting business returns will improve in the 2019–20 season.

Responses to the survey took into consideration all aspects of farming including climate and market conditions for all products bought and sold.

Of the respondents, 81% expect an improvement in their business returns, 4% expect a decline and 15% expect no change (Figure 19). The percentage expecting improvement is higher than last year's 75% that anticipated an improvement in business returns. The expectations of the 75% of participants from last season expecting an increase in business returns were not met as business returns for 2018–19 decreased.

Price and production expectations – milk

The majority (59%) of participants expect milk price to increase for the 2019–20 season (Figure 20). A third (33%) expect milk price to remain the same and 7% expect milk price to decrease.

There was a big increase in the number of participants expecting their milk production to increase in 2019–20. For this survey, 74% of participants expect their milk production to increase compared to only 57% at the last survey. Average milk production per farm did increase for participant farmers in 2018–19 although overall, Tasmania had a small decline in milk production for 2018–19. The farmers that don't expect their milk production to increase in 2019–20, think it will remain stable. No-one thinks their milk production will decrease.

Production expectations – fodder

Just above half of participants (52%) expect fodder production to increase for 2019–20 (Figure 21). This is slightly higher than the previous survey. A further 44% expect their fodder production to remain stable with only 4% expecting fodder production to decrease. Given the pasture-based nature of the Tasmanian dairy industry, the fodder production expectations do not match the milk production expectations. This is perhaps explained by farmers anticipating additional milk production will be achieved by increasing cow numbers.

Figure 18 Expectation of business returns

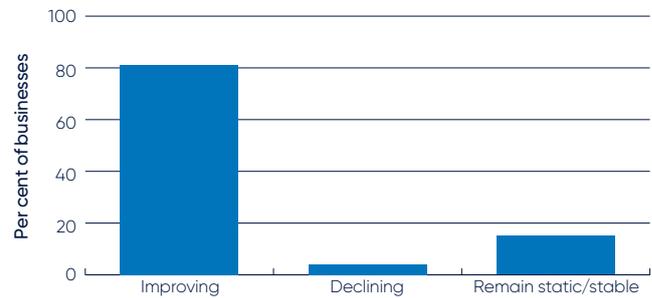


Figure 19 Price and production expectations – milk

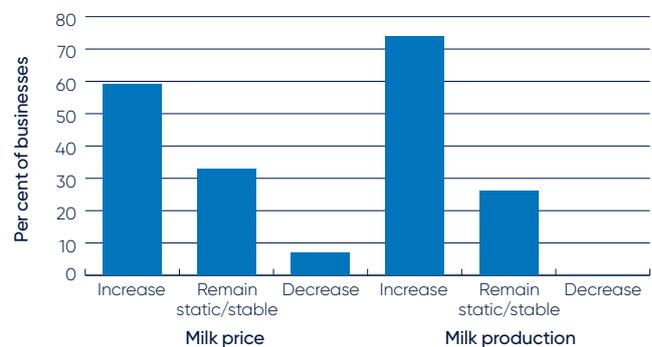
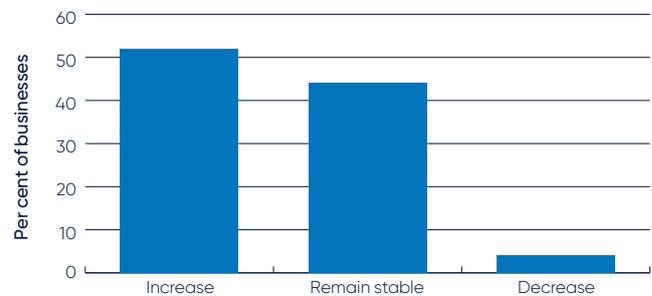


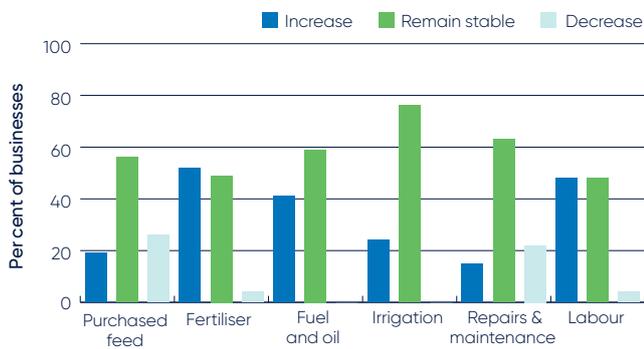
Figure 20 Producer expectations – fodder



Cost expectations

After an expected increase in the cost of purchased feed for 2018–19, most participants expect purchased feed costs to remain stable (56%) or decrease (26%). Only 19% of participants anticipate feed costs will be higher in 2019–20. Over half of participants expect fertiliser costs to increase and almost half of participants expect labour costs to increase. Three-quarters of participants expect irrigation costs to remain stable. Almost a quarter of participants expect their repairs and maintenance costs to decrease.

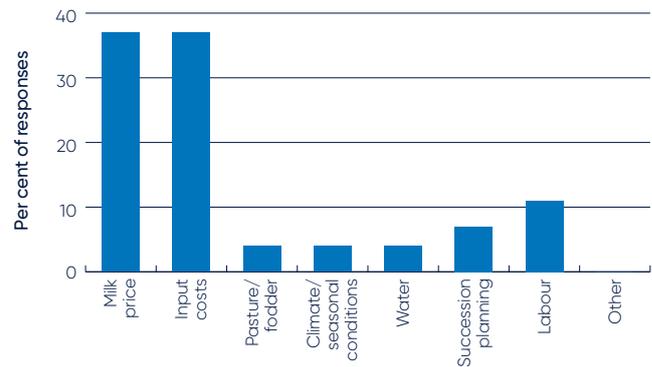
Figure 21 Costs expectations



Major issues in the dairy industry – the next 12 months

Figure 23 provides a summary of the ranking of key issues identified by participants for the coming 2019–20 season. Similarly to most years, milk price and input costs are the major concerns of the participants. Labour was the next highest concern.

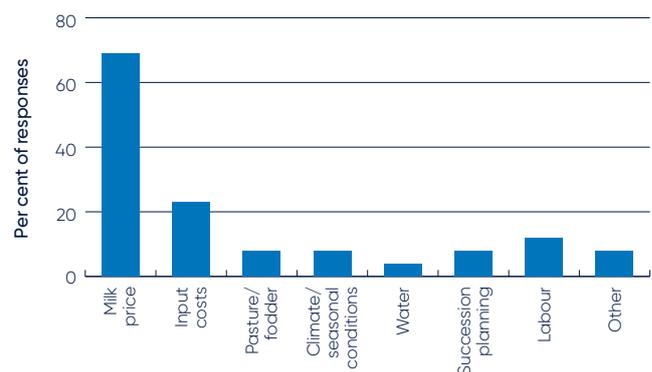
Figure 22 Major issues facing the dairy industry – the next 12 months



Major issues in the dairy industry – the next 5 years

Milk price is the dominant concern for participants over the next five year. This is followed by input costs and labour.

Figure 23 Major issues for individual businesses – 5 years outlook



Historical analysis



The dollar values are adjusted to allow comparison between years, however, the number of farms in the sample is not consistent and some farms do not participate each year and new farms are added to the sample; care needs to be taken when comparing performance across years.

Earnings before interest and tax and net farm income declined in 2018–19.

As can be seen in Figure 25, despite a higher milk price, the average EBIT and net farm income of participants declined in 2018–19.

Net farm income decreased from \$363,948 in 2017–18 (adjusted for inflation) to \$317,530 this season.

EBIT decreased from \$501,640 in 2017–18 (adjusted for inflation) to \$468,542.

The reduced dairy farm profitability was a result of increased operating costs.

The difference between EBIT and net income is interest and lease costs. In real terms, there was very little change in interest and lease costs this year, they increased from \$0.58/kg MS to \$0.66/kg MS.

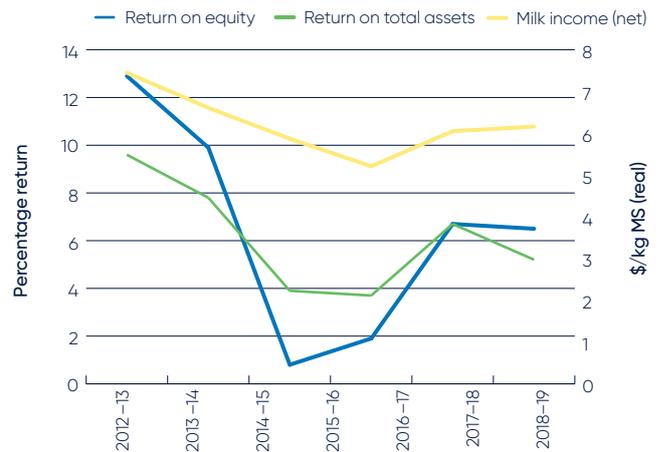
Figure 24 Historical EBIT and net farm income



Over the past 6 years, the RoTA has only increased once (2017–18). In 2018–19, it decreased from 6.3% to 5.2%. Return on equity also decreased but not to the same extent. RoE decreased from 6.7% in 2017–18 to 6.5%. Average RoE is higher than RoTA for the second consecutive year.

Milk price increased from \$6.05/kg MS (adjusted for inflation) in 2017–18 to \$6.16/kg MS in 2018–19

Figure 25 Regional return on total assets (LHS), return on equity (LHS) and milk price (RHS)



Appendices



APPENDIX A – SUMMARY TABLES

Table A1 Main financial indicators

Farm number	Milk income (net)	All other income	Gross farm income	Total variable costs	Total overhead costs	Cost structure (variable costs/total costs)	Earnings before interest and tax	Return on total assets (exc. capital apprec.)	Interest and lease charges	Debt servicing ratio	Net farm income	Return on equity
	\$ kg/ MS	\$/kg MS	\$ kg/ MS	\$/kg MS	\$/kg MS	per cent	\$/kg MS	per cent	\$/kg MS	per cent of income	\$ kg/ MS	per cent
TA0001	5.84	0.95	6.79	2.80	2.26	55	1.73	3.6	1.29	19.0	0.44	1.9
TA0006	5.77	1.05	6.82	3.09	1.92	62	1.81	5.4	0.10	1.5	1.70	5.5
TA0007	6.35	0.12	6.47	1.88	3.01	38	1.58	3.4	0.52	8.0	1.06	3.0
TA0008	6.69	0.46	7.16	3.64	1.73	68	1.78	7.7	0.27	3.8	1.51	9.5
TA0011	5.88	0.98	6.86	3.24	2.98	52	0.63	1.8	0.88	12.9	-0.25	-1.8
TA0012	6.20	0.68	6.89	3.15	2.08	60	1.66	6.1	0.31	4.4	1.35	7.4
TA0016	6.84	0.90	7.74	2.83	1.41	67	3.50	15.5	0.01	0.1	3.49	15.6
TA0026	7.01	0.13	7.14	4.33	1.66	72	1.15	4.6	0.50	7.0	0.65	4.9
TA0028	6.18	0.12	6.30	3.49	1.82	66	0.98	3.4	0.15	2.4	0.83	3.4
TA0031	5.95	0.88	6.84	3.24	2.43	57	1.17	3.2	0.57	8.4	0.59	3.0
TA0035	6.54	0.36	6.91	2.82	1.60	64	2.48	10.6	0.09	1.3	2.39	11.5
TA0038	5.67	0.96	6.64	2.77	2.29	55	1.58	4.7	0.18	2.7	1.40	4.7
TA0044	7.47	-0.15	7.33	2.19	4.02	35	1.12	1.8	1.82	24.8	-0.70	-2.8
TA0046	6.01	0.70	6.72	2.83	2.17	57	1.71	6.6	0.79	11.7	0.93	8.0
TA0048	5.80	0.73	6.53	4.14	2.48	63	-0.08	-0.3	1.06	16.2	-1.14	-18.9
TA0050	6.04	0.35	6.39	3.22	1.45	69	1.73	8.7	0.76	11.9	0.96	36.9
TA0051	6.72	0.83	7.55	2.92	2.92	50	1.71	3.3	1.14	15.1	0.57	2.2
TA0052	6.06	0.32	6.38	3.06	1.14	73	2.18	13.0	0.26	4.1	1.92	17.1
TA0053	6.04	0.50	6.54	3.23	0.88	79	2.43	8.9	0.20	3.1	2.23	10.4
TA0054	6.02	0.40	6.42	3.57	2.10	63	0.74	2.9	0.58	9.0	0.16	1.2
TA0055	5.81	0.48	6.29	4.41	1.97	69	-0.09	-0.4	0.58	9.2	-0.67	-5.6
TA0056	5.84	0.59	6.43	3.83	2.24	63	0.36	1.2	0.73	11.4	-0.38	-3.0
TA0058	6.29	0.96	7.25	3.36	1.79	65	2.10	4.9	0.92	12.6	1.18	7.1
TA0060	5.95	1.39	7.34	3.98	2.15	65	1.21	3.4	0.85	11.6	0.36	2.2
TA0061	5.90	0.72	6.62	3.70	1.70	69	1.23	4.0	0.73	11.0	0.50	3.1
TA0063	5.91	0.53	6.44	3.37	1.16	74	1.91	9.0	0.92	14.3	1.00	38.2
TA0067	6.13	0.52	6.65	3.43	1.44	70	1.78	7.9	0.52	7.8	1.26	13.2
TA0068	6.56	1.59	8.15	3.11	3.31	48	1.73	2.4	1.30	15.9	0.43	1.2
TA0069	6.15	1.13	7.28	3.54	1.52	70	2.22	8.9	0.33	4.5	1.89	20.2
TA0070	5.81	2.19	8.00	2.81	3.64	44	1.55	2.4	0.42	5.2	1.13	2.1
TA0071	5.76	1.03	6.79	2.95	4.99	37	-1.15	-1.9	1.80	26.5	-2.95	-11.4
TA0072	6.05	0.95	7.00	3.57	1.75	67	1.69	9.6	0.62	8.9	1.07	19.0
Average	6.16	0.73	6.90	3.27	2.19	61	1.44	5.2	0.66	9.6	0.78	6.5
Top 25*	6.20	0.63	6.83	3.20	1.36	70	2.27	10.5	0.40	6.0	1.87	21.1

Table A2 Physical information

Farm number	Total usable area	Milking area	Total water use efficiency	Number of milking cows	Milking cows per usable area	Milk sold	Milk sold	Fat	Protein
	ha	ha	t DM/100mm/ha	hd	hd/ha	kg MS/cow	kg MS/ha	per cent	per cent
TA0001	240	144	0.9	448	1.9	263	490	5.1	3.9
TA0006	88	88	0.8	295	3.4	379	1272	4.8	3.6
TA0007	212	212	0.6	404	1.9	314	598	4.3	3.4
TA0008	512	300	0.8	1,050	2.1	501	1028	3.9	3.3
TA0011	266	185	0.7	490	1.8	379	699	4.6	3.5
TA0012	442	282	0.8	580	1.3	422	554	4.7	3.6
TA0016	169	169	1.1	615	3.6	467	1701	5.0	3.8
TA0026	253	253	0.7	720	2.8	422	1202	4.8	3.7
TA0028	550	250	0.9	900	1.6	571	934	4.1	3.4
TA0031	604	236	1.5	900	1.5	481	717	5.2	3.7
TA0035	435	270	1.0	1,080	2.5	453	1125	5.0	3.9
TA0038	265	165	0.8	372	1.4	489	686	4.3	3.2
TA0044	234	234	0.5	375	1.6	275	441	5.2	3.8
TA0046	497	274	1.1	840	1.7	423	716	4.5	3.5
TA0048	135	70	0.7	200	1.5	365	541	4.5	3.4
TA0050	330	265	1.2	1,030	3.1	459	1433	4.7	3.8
TA0051	57	57	1.0	200	3.5	280	982	5.2	3.8
TA0052	230	230	1.6	780	3.4	640	2172	4.7	3.7
TA0053	380	360	0.9	1,150	3.0	464	1404	4.8	3.7
TA0054	120	120	0.7	332	2.8	456	1263	4.2	3.6
TA0055	80	80	0.7	200	2.5	503	1256	4.5	3.5
TA0056	145	108	0.7	236	1.6	480	782	4.6	3.5
TA0058	750	450	0.6	1,350	1.8	339	610	4.6	3.7
TA0060	292	229	0.8	660	2.3	313	708	4.3	3.4
TA0061	500	300	0.8	1,050	2.1	545	1144	3.8	3.4
TA0063	290	266	0.9	842	2.9	459	1333	4.3	3.4
TA0067	427	396	0.8	1,235	2.9	435	1256	4.9	3.8
TA0068	389	161	0.5	482	1.2	268	332	4.7	3.5
TA0069	279	249	1.1	750	2.7	480	1290	4.5	3.5
TA0070	172	58	0.8	200	1.2	319	371	4.6	3.7
TA0071	240	110	0.5	270	1.1	344	388	4.4	3.3
TA0072	190	141	0.7	420	2.2	398	880	5.0	3.7
Average	305	210	0.8	639	2.2	418	947	4.6	3.6
Top 25*	288	244	1.1	833	2.9	478	1,417	4.8	3.7

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	per cent of ME	kg/ha	kg/ha	kg/ha	kg/ha	hd/FTE	kg MS/FTE
TA0001	10.1	0.0	85	33.9	15.6	19.8	9.4	255	67,059
TA0006	11.0	0.5	74	218.4	19.5	48.1	21.7	148	55,960
TA0007	7.5	0.1	84	24.5	24.5	36.8	0.0	116	36,456
TA0008	13.1	0.0	70	0.0	61.5	87.9	0.0	134	67,229
TA0011	9.6	0.0	81	122.5	3.9	12.2	18.2	103	38,915
TA0012	5.7	2.1	75	163.6	19.2	40.5	26.2	133	56,061
TA0016	13.5	0.4	72	223.7	21.1	39.2	0.0	104	48,771
TA0026	7.7	0.9	56	176.4	24.3	34.8	30.6	200	84,455
TA0028	12.0	0.5	69	137.9	21.5	31.1	18.1	125	71,279
TA0031	12.5	1.7	77	30.0	10.2	13.0	13.4	130	62,797
TA0035	12.7	1.7	81	232.8	26.0	35.1	18.3	224	101,597
TA0038	10.4	1.1	83	196.5	39.3	59.9	39.3	106	51,985
TA0044	6.5	1.9	100	2.1	38.2	2.8	0.0	128	35,318
TA0046	11.0	0.9	79	114.0	18.0	26.1	16.5	146	61,622
TA0048	8.6	0.9	82	98.9	34.4	28.6	30.7	167	60,813
TA0050	13.6	0.6	74	230.1	50.0	31.2	1.7	169	77,731
TA0051	11.4	1.7	89	173.1	15.3	16.0	32.9	139	38,962
TA0052	16.7	0.7	74	222.3	9.9	32.2	12.4	146	93,665
TA0053	12.4	1.0	78	295.2	15.7	26.3	10.7	200	92,810
TA0054	10.2	1.3	62	376.5	36.0	15.2	12.1	147	67,207
TA0055	7.9	1.2	56	256.9	53.1	35.9	19.5	138	69,311
TA0056	8.0	1.5	79	111.5	15.5	24.5	17.2	127	60,876
TA0058	8.6	0.4	82	349.5	166.4	90.0	179.5	196	66,492
TA0060	11.4	0.0	79	251.0	37.4	65.8	35.7	145	45,439
TA0061	11.1	1.8	63	208.0	30.0	48.0	24.0	153	83,273
TA0063	11.7	0.5	67	268.0	29.3	58.6	8.8	197	90,499
TA0067	9.0	1.3	68	243.4	31.6	41.5	12.0	212	92,150
TA0068	6.8	0.2	86	28.6	23.3	12.6	8.6	123	32,838
TA0069	12.5	2.6	77	148.4	48.4	89.6	71.6	194	93,257
TA0070	10.6	0.0	84	15.3	17.9	15.1	16.4	104	33,061
TA0071	7.9	0.1	81	39.2	6.2	9.2	3.8	56	19,316
TA0072	10.0	0.0	67	150.1	15.6	22.3	0.0	210	83,582
Average	10.4	1.1	76	160.7	30.6	35.9	22.2	152.4	63,775
Top 25*	12.9	1.1	74	221.3	27.0	41.8	15.4	180.7	85,239

*on milking area

Table A3 Purchased feed

Farm number	Purchased feed per milker	Concentrate price	Silage price	Hay price	Other feed price	Average purchased feed price	of total energy imported
	t DM/hd	\$/t DM	\$/t DM	\$/t DM	\$/t DM	\$/t DM	per cent of ME
TA0001	0.8	578	342	136	0	354	15
TA0006	1.2	546	202	117	0	407	26
TA0007	0.8	450	0	171	0	368	16
TA0008	2.1	703	0	322	498	573	30
TA0011	1.1	580	0	213	0	330	19
TA0012	1.4	474	200	0	0	428	25
TA0016	1.5	552	230	143	0	437	28
TA0026	2.3	519	270	0	0	435	44
TA0028	1.9	609	0	0	0	609	31
TA0031	1.5	656	235	146	0	594	23
TA0035	0.9	453	0	0	0	453	19
TA0038	1.2	576	0	187	0	439	17
TA0044	0.0	0	0	0	0	0	0
TA0046	1.0	493	0	158	0	487	21
TA0048	0.9	527	246	106	0	433	18
TA0050	1.2	476	154	304	0	432	26
TA0051	0.4	474	0	0	0	474	11
TA0052	1.6	588	310	165	0	559	26
TA0053	1.1	583	280	285	0	522	22
TA0054	2.4	532	164	149	0	413	38
TA0055	3.1	542	317	144	0	381	44
TA0056	1.5	614	0	0	0	614	21
TA0058	0.9	446	0	0	0	446	18
TA0060	1.1	505	282	162	0	496	21
TA0061	2.5	538	0	330	0	525	37
TA0063	1.9	587	205	71	0	494	33
TA0067	1.6	529	393	213	0	462	32
TA0068	0.6	650	0	0	0	650	14
TA0069	1.4	610	210	209	0	508	23
TA0070	1.2	563	0	101	0	249	16
TA0071	0.9	576	0	0	0	576	19
TA0072	1.5	509	0	272	0	464	33
Average	1.4	550	253	186	498	471	25
Top 25*	1.4	545	232	207	n/a	483	26

Table A4 Variable costs

Farm number	AI and herd test	Animal health	Calf rearing	Shed power	Dairy supplies	Total herd and shed costs	Fertiliser	Irrigation	Hay and silage making
	\$ kg/MS	\$ kg/MS	\$ kg/MS	\$ kg/MS	\$ kg/MS	\$ kg/MS	\$ kg/MS	\$ kg/MS	\$ kg/MS
TA0001	0.09	0.21	0.04	0.12	0.05	0.52	0.30	0.00	0.13
TA0006	0.08	0.12	0.06	0.07	0.08	0.41	0.41	0.07	0.07
TA0007	0.06	0.09	0.01	0.05	0.04	0.26	0.27	0.02	0.02
TA0008	0.10	0.18	0.04	0.09	0.09	0.50	0.29	0.14	0.14
TA0011	0.14	0.22	0.03	0.08	0.08	0.56	0.35	0.20	0.20
TA0012	0.07	0.05	0.02	0.09	0.08	0.31	0.85	0.28	0.28
TA0016	0.07	0.13	0.02	0.08	0.05	0.35	0.26	0.02	0.02
TA0026	0.08	0.21	0.18	0.09	0.05	0.61	0.39	0.19	0.19
TA0028	0.09	0.16	0.08	0.07	0.07	0.46	0.41	0.32	0.32
TA0031	0.06	0.25	0.05	0.05	0.04	0.45	0.28	0.30	0.30
TA0035	0.10	0.18	0.04	0.05	0.03	0.41	0.46	0.32	0.32
TA0038	0.00	0.15	0.03	0.07	0.12	0.38	0.68	0.07	0.07
TA0044	0.06	0.12	0.02	0.14	0.32	0.66	0.56	0.39	0.39
TA0046	0.14	0.18	0.01	0.09	0.05	0.46	0.57	0.12	0.12
TA0048	0.09	0.14	0.06	0.16	0.14	0.59	0.67	0.52	0.52
TA0050	0.16	0.15	0.25	0.08	0.07	0.70	0.48	0.04	0.04
TA0051	0.08	0.10	0.06	0.11	0.10	0.44	0.31	0.18	0.18
TA0052	0.13	0.17	0.05	0.06	0.08	0.50	0.20	0.04	0.04
TA0053	0.18	0.21	0.09	0.05	0.02	0.54	0.49	0.14	0.14
TA0054	0.12	0.18	0.05	0.09	0.10	0.54	0.50	0.04	0.04
TA0055	0.30	0.34	0.04	0.10	0.06	0.84	0.57	0.11	0.11
TA0056	0.07	0.17	0.01	0.13	0.13	0.50	0.38	0.25	0.25
TA0058	0.10	0.09	0.04	0.15	0.08	0.47	1.07	0.26	0.26
TA0060	0.15	0.16	0.00	0.15	0.14	0.61	0.84	0.18	0.18
TA0061	0.08	0.20	0.02	0.04	0.03	0.37	0.54	0.12	0.12
TA0063	0.09	0.08	0.11	0.09	0.12	0.48	0.43	0.05	0.05
TA0067	0.07	0.14	0.01	0.05	0.05	0.33	0.55	0.18	0.18
TA0068	0.08	0.04	0.04	0.30	0.12	0.58	0.41	0.05	0.05
TA0069	0.10	0.17	0.02	0.08	0.07	0.45	0.43	0.23	0.23
TA0070	0.13	0.15	0.01	0.09	0.05	0.43	0.39	0.20	0.20
TA0071	0.01	0.10	0.11	0.30	0.00	0.51	0.40	0.02	0.02
TA0072	0.08	0.14	0.01	0.10	0.08	0.41	0.39	0.00	0.00
Average	0.10	0.16	0.05	0.10	0.08	0.49	0.47	0.16	0.16
Top 25*	0.11	0.15	0.07	0.07	0.07	0.48	0.39	0.11	0.11

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
TA0001	0.17	0.16	0.04	0.32	0.65	0.01	0.10	2.28	2.80
TA0006	0.09	0.19	0.06	0.22	1.01	0.54	-0.02	2.68	3.09
TA0007	0.11	0.02	0.00	0.12	0.77	0.21	-0.11	1.62	1.88
TA0008	0.06	0.18	0.00	0.41	2.12	0.05	-0.25	3.14	3.64
TA0011	0.13	0.21	0.00	0.54	0.69	0.52	-0.27	2.69	3.24
TA0012	0.11	0.31	0.00	0.00	1.38	0.00	-0.15	2.84	3.15
TA0016	0.06	0.01	0.00	0.21	1.00	0.68	0.11	2.48	2.83
TA0026	0.04	0.27	0.00	0.48	1.80	0.48	0.01	3.72	4.33
TA0028	0.06	0.05	0.00	0.00	2.06	0.00	0.00	3.03	3.49
TA0031	0.11	0.17	0.00	0.08	1.67	0.00	-0.05	2.79	3.24
TA0035	0.02	0.02	0.00	0.00	0.88	0.43	0.13	2.41	2.82
TA0038	0.17	0.25	0.00	0.19	1.08	0.00	-0.12	2.39	2.77
TA0044	0.15	0.03	0.00	0.00	0.00	0.00	0.06	1.53	2.19
TA0046	0.09	0.13	0.01	0.01	1.43	0.00	-0.30	2.37	2.83
TA0048	0.16	0.56	0.00	0.12	1.16	0.18	-0.20	3.55	4.14
TA0050	0.04	0.05	0.00	0.11	1.13	0.45	-0.05	2.51	3.22
TA0051	0.11	0.01	0.00	0.00	0.68	0.76	0.21	2.48	2.92
TA0052	0.02	0.22	0.00	0.05	1.44	0.49	-0.02	2.56	3.06
TA0053	0.03	0.05	0.00	0.14	1.10	0.66	-0.05	2.69	3.23
TA0054	0.03	0.29	0.01	0.27	2.07	0.00	-0.29	3.04	3.57
TA0055	0.05	0.14	0.06	0.42	1.62	0.24	0.10	3.57	4.41
TA0056	0.13	0.54	0.01	0.00	1.22	0.00	0.29	3.33	3.83
TA0058	0.08	0.01	0.02	0.00	1.24	0.00	-0.02	2.90	3.36
TA0060	0.07	0.23	0.01	0.02	1.76	0.20	-0.10	3.38	3.98
TA0061	0.06	0.03	0.00	0.09	2.20	0.12	0.10	3.32	3.70
TA0063	0.03	0.07	0.00	0.07	1.71	0.42	0.03	2.89	3.37
TA0067	0.02	0.14	0.00	0.48	1.23	0.61	-0.13	3.10	3.43
TA0068	0.25	0.12	0.00	0.00	1.37	0.01	-0.25	2.53	3.11
TA0069	0.05	0.15	0.00	0.18	1.52	0.52	-0.12	3.09	3.54
TA0070	0.21	0.15	0.00	0.26	0.69	0.00	0.23	2.39	2.81
TA0071	0.22	0.04	0.00	0.00	1.51	0.00	0.07	2.44	2.95
TA0072	0.05	0.23	0.00	0.22	1.72	0.52	-0.09	3.16	3.57
Average	0.09	0.16	0.01	0.16	1.31	0.25	-0.04	2.78	3.27
Top 25*	0.04	0.10	0.00	0.12	1.31	0.52	-0.01	2.72	3.20

Table A5 Overhead costs

Farm number	Rates	Farm insurance	Motor vehicle expenses	Repairs and maintenance	Other overheads	Employed labour	Total cash overheads	Depreciation	Imputed owner/operator and family labour	Total overheads
	\$ kg/MS	\$ kg/MS	\$ kg/MS	\$ kg/MS	\$ kg/MS	\$ kg/MS	\$ kg/MS	\$ kg/MS	\$ kg/MS	\$ kg/MS
TA0001	0.07	0.09	0.13	0.32	0.33	0.48	1.43	0.14	0.69	2.26
TA0006	0.05	0.05	0.01	0.18	0.20	0.56	1.04	0.23	0.65	1.92
TA0007	0.11	0.12	0.02	0.40	0.10	0.59	1.34	0.50	1.16	3.01
TA0008	0.04	0.09	0.01	0.38	0.08	0.59	1.19	0.26	0.28	1.73
TA0011	0.04	0.06	0.02	0.55	0.12	0.78	1.57	0.41	1.01	2.98
TA0012	0.12	0.05	0.12	0.16	0.12	1.26	1.83	0.19	0.06	2.08
TA0016	0.03	0.05	0.01	0.20	0.04	0.80	1.13	0.24	0.04	1.41
TA0026	0.06	0.07	0.03	0.39	0.09	0.85	1.50	0.16	0.00	1.66
TA0028	0.03	0.06	0.01	0.50	0.07	1.04	1.70	0.13	0.00	1.82
TA0031	0.03	0.11	0.11	0.51	0.09	0.94	1.78	0.40	0.25	2.43
TA0035	0.02	0.05	0.08	0.36	0.10	0.58	1.18	0.15	0.27	1.60
TA0038	0.05	0.10	0.02	0.34	0.04	1.02	1.57	0.33	0.40	2.29
TA0044	0.08	0.08	0.13	0.51	0.29	1.57	2.65	0.66	0.71	4.02
TA0046	0.03	0.07	0.05	0.30	0.18	0.99	1.62	0.35	0.20	2.17
TA0048	0.03	0.15	0.03	0.60	0.07	0.00	0.89	0.39	1.20	2.48
TA0050	0.02	0.03	0.03	0.36	0.05	0.92	1.40	0.04	0.00	1.45
TA0051	0.06	0.14	0.07	0.17	0.13	0.83	1.39	0.59	0.94	2.92
TA0052	0.02	0.02	0.04	0.09	0.02	0.83	1.02	0.12	0.00	1.14
TA0053	0.02	0.04	0.00	0.31	0.06	0.00	0.43	0.42	0.03	0.88
TA0054	0.05	0.09	0.07	0.40	0.06	0.22	0.90	0.34	0.86	2.10
TA0055	0.04	0.05	0.08	0.37	0.17	0.00	0.70	0.22	1.05	1.97
TA0056	0.06	0.10	0.02	0.52	0.04	0.05	0.78	0.33	1.13	2.24
TA0058	0.05	0.05	0.02	0.31	0.12	0.77	1.32	0.16	0.32	1.79
TA0060	0.04	0.03	0.11	0.38	0.03	0.62	1.21	0.13	0.81	2.15
TA0061	0.03	0.05	0.01	0.42	0.10	0.81	1.41	0.13	0.15	1.70
TA0063	0.03	0.04	0.01	0.23	0.03	0.53	0.87	0.04	0.24	1.16
TA0067	0.02	0.03	0.02	0.33	0.08	0.75	1.23	0.12	0.09	1.44
TA0068	0.03	0.00	0.07	0.33	0.10	1.40	1.93	0.60	0.78	3.31
TA0069	0.01	0.04	0.00	0.36	0.10	0.80	1.31	0.21	0.00	1.52
TA0070	0.11	0.13	0.03	0.48	0.11	0.89	1.75	0.52	1.37	3.64
TA0071	0.08	0.18	0.04	0.27	0.10	0.73	1.40	0.83	2.76	4.99
TA0072	0.04	0.06	0.00	0.35	0.05	1.20	1.71	0.04	0.00	1.75
Average	0.05	0.07	0.04	0.36	0.10	0.73	1.35	0.29	0.55	2.19
Top 25*	0.02	0.04	0.02	0.28	0.06	0.71	1.13	0.16	0.07	1.36

Table A6 Variable costs – percentage

Farm number	AI and herd test	Animal health	Calf rearing	Shed power	Dairy supplies	Total herd & shed costs	Fertiliser	Irrigation	Hay and silage making
	per cent of costs	per cent of costs	per cent of costs	per cent of costs					
TA0001	1.8	4.2	0.8	2.4	1.0	10.2	5.9	0.0	2.6
TA0006	1.7	2.4	1.1	1.4	1.6	8.2	8.1	1.4	1.4
TA0007	1.3	1.8	0.2	1.1	0.9	5.3	5.6	0.3	0.3
TA0008	1.8	3.4	0.8	1.6	1.7	9.3	5.3	2.6	2.6
TA0011	2.2	3.6	0.5	1.3	1.3	9.0	5.6	3.2	3.2
TA0012	1.4	1.0	0.3	1.7	1.5	6.0	16.3	5.4	5.4
TA0016	1.7	3.0	0.4	2.0	1.2	8.3	6.1	0.4	0.4
TA0026	1.3	3.5	3.0	1.5	0.8	10.1	6.5	3.2	3.2
TA0028	1.7	3.0	1.5	1.3	1.2	8.7	7.8	6.0	6.0
TA0031	1.1	4.4	0.9	0.8	0.7	7.9	5.0	5.3	5.3
TA0035	2.3	4.1	0.9	1.2	0.8	9.2	10.4	7.3	7.3
TA0038	0.0	3.0	0.6	1.5	2.4	7.5	13.5	1.3	1.3
TA0044	1.0	1.9	0.3	2.3	5.1	10.6	9.0	6.3	6.3
TA0046	2.7	3.5	0.1	1.8	1.0	9.2	11.5	2.4	2.4
TA0048	1.4	2.1	1.0	2.4	2.1	8.9	10.1	7.8	7.8
TA0050	3.4	3.1	5.4	1.6	1.5	15.1	10.3	0.9	0.9
TA0051	1.4	1.6	1.0	1.8	1.7	7.5	5.2	3.2	3.2
TA0052	3.1	4.1	1.3	1.3	2.0	11.9	4.6	0.9	0.9
TA0053	4.3	5.1	2.1	1.2	0.4	13.1	11.9	3.4	3.4
TA0054	2.1	3.2	0.9	1.5	1.8	9.5	8.9	0.8	0.8
TA0055	4.7	5.4	0.7	1.5	0.9	13.2	9.0	1.7	1.7
TA0056	1.1	2.8	0.1	2.1	2.2	8.3	6.3	4.1	4.1
TA0058	1.9	1.8	0.8	3.0	1.6	9.0	20.7	5.1	5.1
TA0060	2.4	2.7	0.1	2.5	2.3	9.9	13.6	2.9	2.9
TA0061	1.6	3.7	0.4	0.7	0.5	6.9	10.0	2.2	2.2
TA0063	2.0	1.7	2.4	1.9	2.6	10.6	9.5	1.2	1.2
TA0067	1.5	2.9	0.3	1.1	1.0	6.8	11.3	3.7	3.7
TA0068	1.2	0.6	0.6	4.7	1.9	9.0	6.4	0.8	0.8
TA0069	2.1	3.4	0.4	1.7	1.4	8.9	8.6	4.6	4.6
TA0070	1.9	2.3	0.1	1.4	0.8	6.6	6.1	3.0	3.0
TA0071	0.1	1.2	1.4	3.7	0.0	6.4	5.0	0.3	0.3
TA0072	1.4	2.7	0.2	1.9	1.5	7.7	7.3	0.0	0.0
Average	1.9	2.9	1.0	1.8	1.5	9.0	8.8	2.9	3.0
Top 25*	2.5	3.4	1.6	1.6	1.4	10.6	8.6	2.3	2.3

Farm number	Fuel and oil	Pasture improvement/cropping	Other feed costs	Fodder purchases	Grain/concentrates/other	Agistment costs	Feed and water inventory change	Total feed costs	Total variable costs
	per cent of costs	per cent of costs	per cent of costs	per cent of costs	per cent of costs	per cent of costs	per cent of costs	per cent of costs	per cent of costs
TA0001	3.3	3.2	0.9	6.3	12.9	0.3	2.0	45.2	55.4
TA0006	1.7	3.9	1.1	4.5	20.1	10.7	-0.4	53.4	61.6
TA0007	2.2	0.5	0.0	2.5	15.7	4.2	-2.3	33.2	38.5
TA0008	1.2	3.3	0.0	7.6	39.5	0.9	-4.7	58.4	67.8
TA0011	2.0	3.3	0.0	8.6	11.0	8.4	-4.3	43.1	52.1
TA0012	2.1	6.0	0.0	0.0	26.3	0.0	-2.9	54.3	60.3
TA0016	1.4	0.3	0.0	5.0	23.6	16.1	2.5	58.4	66.8
TA0026	0.7	4.6	0.0	8.0	30.0	8.0	0.2	62.2	72.3
TA0028	1.2	1.0	0.0	0.0	38.8	0.0	-0.1	57.0	65.7
TA0031	1.9	3.0	0.0	1.4	29.5	0.0	-0.8	49.2	57.1
TA0035	0.5	0.3	0.0	0.0	19.9	9.7	2.9	54.5	63.8
TA0038	3.4	5.0	0.0	3.8	21.3	0.0	-2.4	47.3	54.7
TA0044	2.4	0.6	0.0	0.0	0.0	0.0	1.0	24.7	35.3
TA0046	1.9	2.6	0.2	0.2	28.7	0.0	-6.0	47.4	56.6
TA0048	2.4	8.4	0.0	1.8	17.5	2.7	-3.0	53.7	62.5
TA0050	0.8	1.0	0.0	2.4	24.3	9.6	-1.0	53.9	69.0
TA0051	1.8	0.2	0.0	0.0	11.6	12.9	3.6	42.5	50.0
TA0052	0.5	5.3	0.0	1.3	34.4	11.7	-0.4	60.9	72.8
TA0053	0.6	1.2	0.0	3.3	26.7	16.0	-1.2	65.5	78.5
TA0054	0.6	5.1	0.1	4.8	36.5	0.0	-5.1	53.5	62.9
TA0055	0.7	2.2	0.9	6.6	25.4	3.8	1.6	55.9	69.1
TA0056	2.1	8.9	0.2	0.0	20.0	0.0	4.8	54.8	63.1
TA0058	1.6	0.3	0.4	0.0	24.0	0.0	-0.5	56.2	65.2
TA0060	1.2	3.8	0.2	0.4	28.7	3.3	-1.7	55.1	65.0
TA0061	1.2	0.6	0.0	1.6	40.8	2.2	1.8	61.6	68.6
TA0063	0.6	1.6	0.0	1.5	37.8	9.2	0.8	63.9	74.5
TA0067	0.4	2.8	0.1	9.9	25.2	12.4	-2.7	63.7	70.5
TA0068	3.9	1.9	0.0	0.0	21.3	0.2	-3.9	39.4	48.4
TA0069	1.1	2.9	0.0	3.6	30.0	10.3	-2.3	61.1	70.0
TA0070	3.2	2.3	0.0	4.1	10.7	0.0	3.6	37.0	43.6
TA0071	2.7	0.5	0.0	0.0	19.0	0.0	0.8	30.8	37.1
TA0072	1.0	4.2	0.0	4.1	32.4	9.8	-1.7	59.4	67.1
Average	1.6	2.8	0.1	2.9	24.5	5.1	-0.7	51.8	60.8
Top 25*	0.8	2.1	0.0	2.6	28.6	11.5	0.0	59.7	70.3

Table A7 Overhead costs – percentage

Farm number	Rates	Farm insurance	Motor vehicle expenses	Repairs and maintenance	Other	Employed labour	Total cash	Depreciation	Imputed owner/operator and family labour	Total
	per cent of costs	per cent of costs	per cent of costs	per cent of costs	per cent of costs	per cent of costs	per cent of costs	per cent of costs	per cent of costs	per cent of costs
TA0001	1.4	1.9	2.6	6.3	6.5	9.5	28.2	2.8	13.6	44.6
TA0006	1.0	0.9	0.2	3.7	4.0	11.1	20.8	4.6	13.0	38.4
TA0007	2.3	2.5	0.5	8.2	2.1	12.0	27.5	10.3	23.7	61.5
TA0008	0.8	1.6	0.2	7.0	1.5	11.0	22.2	4.9	5.1	32.2
TA0011	0.6	1.0	0.3	8.8	2.0	12.5	25.2	6.5	16.2	47.9
TA0012	2.4	1.0	2.2	3.0	2.3	24.2	35.0	3.6	1.1	39.7
TA0016	0.6	1.1	0.3	4.8	0.8	18.9	26.6	5.7	1.0	33.2
TA0026	1.0	1.1	0.5	6.6	1.5	14.2	25.0	2.7	0.0	27.7
TA0028	0.5	1.1	0.1	9.5	1.3	19.5	31.9	2.4	0.0	34.3
TA0031	0.6	1.9	1.9	8.9	1.6	16.6	31.4	7.1	4.4	42.9
TA0035	0.5	1.1	1.7	8.0	2.2	13.1	26.6	3.5	6.1	36.2
TA0038	1.1	1.9	0.5	6.8	0.7	20.1	30.9	6.4	7.9	45.3
TA0044	1.4	1.2	2.1	8.1	4.7	25.2	42.7	10.6	11.4	64.7
TA0046	0.6	1.4	0.9	6.0	3.7	19.7	32.4	7.0	4.0	43.4
TA0048	0.5	2.2	0.5	9.1	1.1	0.0	13.5	5.9	18.1	37.5
TA0050	0.4	0.6	0.6	7.8	1.0	19.7	30.0	1.0	0.0	31.0
TA0051	1.0	2.3	1.3	2.9	2.1	14.3	23.9	10.1	16.0	50.0
TA0052	0.5	0.6	0.9	2.1	0.5	19.7	24.2	3.0	0.0	27.2
TA0053	0.5	0.9	0.1	7.6	1.4	0.0	10.5	10.1	0.8	21.5
TA0054	1.0	1.6	1.3	7.0	1.0	3.9	15.8	6.0	15.2	37.1
TA0055	0.6	0.8	1.2	5.8	2.6	0.0	11.0	3.4	16.5	30.9
TA0056	0.9	1.6	0.3	8.5	0.6	0.9	12.8	5.4	18.7	36.9
TA0058	0.9	0.9	0.3	6.1	2.3	15.0	25.6	3.0	6.2	34.8
TA0060	0.6	0.6	1.8	6.2	0.5	10.1	19.7	2.1	13.2	35.0
TA0061	0.6	0.9	0.2	7.7	1.8	14.9	26.2	2.4	2.8	31.4
TA0063	0.7	0.8	0.1	5.1	0.7	11.7	19.3	0.9	5.4	25.5
TA0067	0.4	0.6	0.5	6.8	1.6	15.4	25.3	2.5	1.8	29.5
TA0068	0.5	0.0	1.0	5.2	1.5	21.7	30.0	9.4	12.2	51.6
TA0069	0.3	0.7	0.1	7.1	2.0	15.8	25.9	4.1	0.0	30.0
TA0070	1.8	1.9	0.5	7.5	1.7	13.8	27.2	8.0	21.2	56.4
TA0071	1.0	2.3	0.5	3.4	1.3	9.1	17.7	10.4	34.8	62.9
TA0072	0.7	1.1	0.0	6.7	1.0	22.6	32.1	0.8	0.0	32.9
Average	0.9	1.3	0.8	6.5	1.9	13.6	24.9	5.2	9.1	39.2
Top 25*	0.5	0.9	0.5	6.2	1.2	15.2	24.4	3.6	1.7	29.7

Table A8 Capital structure

Farm assets					Other farm assets (per usable hectare)				
	Land value	Land value	Permanent water value	Permanent water value	Plant and equipment	Livestock	Hay and grain	Other assets	Total assets
	\$/ha	\$/cow	\$/ha	\$/cow	\$/ha	\$/ha	\$/ha	\$/ha	\$/ha
Average	19,715	9,717	1,172	592	963	4491	120	570	24,227

Liabilities			Equity	
	Liabilities per usable hectare		Equity per usable hectare	Average equity
	\$/ha	Liabilities per milking cow	\$/ha	per cent
		\$/cow		
Average	9,016	4,601	15,773	63

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

Income					Variable costs							
Milk income (net)		Gross farm income			Herd costs		Shed costs		Feed costs		Total variable costs	
Year	Nominal (\$ kg/MS)	Real (\$ kg/MS)	Nominal (\$ kg/MS)	Real (\$ kg/MS)	Nominal (\$ kg/MS)	Real (\$ kg/MS)	Nominal (\$ kg/MS)	Real (\$ kg/MS)	Nominal (\$ kg/MS)	Real (\$ kg/MS)	Nominal (\$ kg/MS)	Real (\$ kg/MS)
2013–14	6.87	7.44	7.59	8.22	0.28	0.30	0.23	0.25	2.51	2.72	3.02	3.27
2014–15	6.19	6.61	6.90	7.37	0.29	0.31	0.20	0.21	2.65	2.83	3.13	3.34
2015–16	5.55	5.87	6.10	6.45	0.29	0.31	0.17	0.18	2.81	2.97	3.27	3.46
2016–17	5.03	5.22	5.84	6.06	0.28	0.29	0.20	0.21	2.38	2.47	2.87	2.98
2017–18	5.95	6.05	6.70	6.81	0.30	0.30	0.18	0.18	2.47	2.51	2.95	3.00
2018–19	6.16	6.16	6.90	6.90	0.30	0.30	0.18	0.18	2.78	2.78	3.27	3.27
Average		6.22		6.97		0.30		0.20		2.71		3.22

Overhead costs							Profit							
Cash overhead costs		Non-cash overhead costs		Total overhead costs			Earnings before interest and tax		Interest and lease charges		Net farm income			
Year	Nominal (\$ kg/MS)	Real (\$ kg/MS)	Nominal (\$ kg/MS)	Real (\$ kg/MS)	Nominal (\$ kg/MS)	Real (\$ kg/MS)	Nominal (\$ kg/MS)	Real (\$ kg/MS)	Nominal (\$ kg/MS)	Real (\$ kg/MS)	Nominal (\$ kg/MS)	Real (\$ kg/MS)	Return on total assets per cent	Return on equity per cent
2013–14	1.41	1.53	\$0.73	0.79	2.14	2.32	2.44	2.64	0.47	0.51	1.97	2.13	9.6	12.9
2014–15	1.34	1.43	\$0.60	0.64	1.94	2.07	1.84	1.96	0.42	0.45	1.42	1.51	7.8	9.9
2015–16	1.43	1.51	\$0.48	0.51	1.91	2.02	0.92	0.97	0.56	0.59	0.36	0.38	3.9	0.8
2016–17	1.30	1.35	\$0.68	0.71	1.98	2.05	0.99	1.03	0.63	0.66	0.36	0.37	3.7	1.9
2017–18	1.36	1.38	\$0.73	0.74	2.09	2.13	1.80	1.83	0.66	0.67	1.14	1.16	6.3	6.7
2018–19	1.35	1.35	0.84	0.84	2.19	2.19	1.44	1.44	0.66	0.66	0.78	0.78	5.2	6.5
Average		1.43		0.70		2.13		1.65		0.59		1.05	6.1	6.5

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

Appendix B Glossary of terms, abbreviations and standard values

All other income	Income to the farm from all sources except milk. Includes livestock trading profit, dividends, interest payments received, and rent from farm cottages.	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.
Annual hours	Total hours worked by a person during the given twelve month period.	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.
Appreciation	An increase in the value of an asset in the market place. Often only applicable to land value.	Finance costs	See interest and lease costs.
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.	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.
Cash overheads	All fixed costs that have a cash cost to the business. Includes all overhead costs except imputed labour costs and depreciation.	Grazed area	Total usable area minus any area used only for fodder production during the year
Cost of production	The cost of producing the main product of the business; milk. Usually expressed in terms of the main enterprise output i.e. dollars per kilogram of milk solids. It is reported at the following levels; <ul style="list-style-type: none"> • Cash cost of production; variable costs plus cash overhead costs • Cost of production excluding inventory changes; variable costs plus cash and non-cash overhead costs • Cost of production including inventory changes; variable costs plus cash and non-cash overhead costs, accounting for feed inventory change and livestock inventory change minus livestock purchases 	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)).
Cost structure	Variable costs as a percentage of total costs, where total costs equal variable costs plus overhead costs.	Gross farm income	Farm income including milk sales net of levies and charges, livestock trading profit and other farm income, exclusive of GST.
Debt servicing ratio	Interest and lease costs as a percentage of gross farm income.	Gross margin	Gross farm income minus total variable costs.
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.	Herd costs	Cost of artificial insemination (AI) and herd tests, animal health and calf rearing.
Earnings before interest and tax (EBIT)	Gross farm income minus total variable and total overhead costs.	Imputed	An estimated amount, introduced into economic management analysis to allow reasonable comparisons between years and between other businesses.
EBIT %	The ratio of EBIT compared to gross income. Indicates the percentage of each dollar of gross income that is retained as EBIT.	Imputed labour cost	An allocated allowance for the cost of owner/operator, family and sharefarmer time in the business, valued at \$30.33 per hour.
Employed labour cost	Cash cost of any paid employee, including on-costs such as superannuation and WorkCover.	Interest and lease costs	Total interest plus total lease costs paid.
Equity	Total assets minus total liabilities. Equal to the total value of capital invested in the farm business by the owner/ operator(s).	Labour cost	Cost of the labour resource on farm. Includes both imputed and employed labour costs.
Equity	Total equity as a percentage of the total assets owned. The proportion of the total assets owned by the business.	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 equity as a percentage of the total assets owned. The proportion of the total assets owned by the business.	Labour resource	Any person who works in the business, be they the owner, family, sharefarmer or employed on a permanent, part time or contract basis.
Farm income	See gross farm income.	Liability	Money owed to someone else, e.g. family or a financial institute such as a bank.



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

List of abbreviations

AI	Artificial insemination
CH ₄	Methane gas
CO ₂	Carbon dioxide gas
CO ₂ -e	Carbon dioxide equivalent
CoP	Cost of production
DFMP	Dairy Farm Monitor Project
DM	Dry matter of feed stuffs
DEDJTR	Department of Economic Development, Jobs, Transport and Resources, Victoria
EBIT	Earnings before interest and tax
FTE	Full time equivalent.
GWP	Global Warming Potential
ha	Hectare(s)
hd	Head of cattle
HRWS	High Reliability Water Shares
kg	Kilograms
LRWS	Low Reliability Water Shares.
ME	Metabolisable energy (MJ/kg)
MJ	Megajoules of energy
mm	Millimetres. 1mm is equivalent to 4 points or 1/25 of an inch of rainfall
MS	Milk solids (proteins and fats)
N ₂ O	Nitrous oxide gas
Q1	First quartile, i.e. the value of which one quarter, or 25, of data in that range is less than
Q3	Third quartile, i.e. the value of which one quarter, or 25, of data in that range is greater than
RoTA	Return on total assets
RoE	Return on equity
t	Tonne = 1,000kg

Livestock values

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

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

Imputed owner/operator and family labour

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



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