

DAIRY FARM MONITOR PROJECT

SOUTH AUSTRALIA ANNUAL REPORT 2021/22



ACKNOWLEDGEMENTS

Participants

The participant farmers are thanked for their efforts in supplying data for the Dairy Farm Monitor Project in 2022. A hybrid of face-to-face and remote data collection required additional efforts this year and is greatly appreciated. For continuing participants and those new to the project, thank you for your participation.

Project participants were selected based on a distribution of farm size, feeding system, herd size and geographical location within each region and results should not be viewed as a representation of the entire South Australian dairy farm population.

Report

The report was prepared by Fiona Smith (F. Smith Agribusiness Consulting) in conjunction with Dairy Australia.

Sincere thanks to Agriculture Victoria for the redesign of the presentation of the data in the Annual Report.

Contributors/data collectors

Greg Mitchell (FPAG), Chris Scheid (proadvice) and Fiona Smith (F. Smith Agribusiness Consulting).

These people collected farm data and provided feedback and validation to ensure the accuracy and integrity of the information.

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

Appendix Tables

The appendices at the end of this report provide detailed metrics on the historical physical and financial performance and efficiency for the average of the South Australian project participants.

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EXECUTIVE SUMMARY

In 2021/22 the average South Australia Farm Monitor profitability declined on the previous year and was the third highest in the 10-years of the project (accounting for inflation).

A stable milk price of \$7.59 per kilograms of milk solids (\$/kg MS) and increased livestock trading at \$1.24/kgMS was offset by higher input costs and supply constraints, including for labour, feed and fertiliser which impacted farm business margins in 2021/22.

Farms utilised the favourable cashflow position to invest in infrastructure and machinery and repay debt, resulting in an increase in average equity across participant farms.

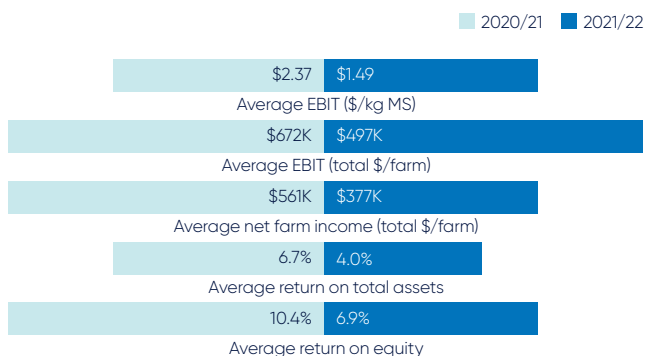
Whilst input costs increased across the year, strong livestock trading conditions and a stable milk price, provided strong cash flow for many participants. The majority of participants (79%) increased their business equity across the year through investment in infrastructure and machinery and repayment of debt along with some expansion of land holdings.

The delayed autumn break resulted in an average decline in fodder reserves on hand at year end and a drop in the average homegrown feed on milking area. Combined with higher input costs for fertiliser, chemicals and contractors the average cost of homegrown feed increased compared to last year.

Gross farm income was the fourth highest over the 10 years and profitability (average EBIT per kilogram of milk solids) was third highest (accounting for inflation).

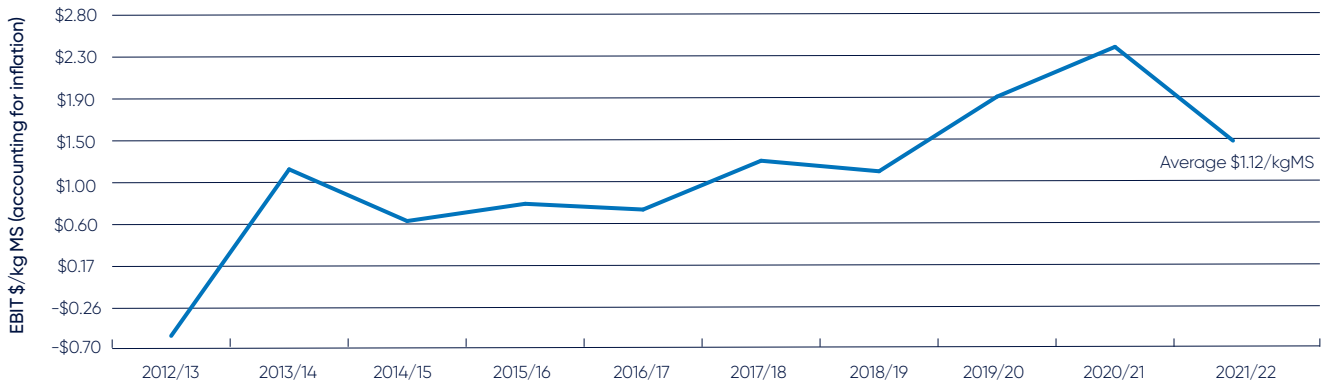
Despite stable milk incomes and good livestock trading conditions, increases in feed and overhead costs resulted in a decrease in average profit compared to the previous year for participating farms.

South Australia



How does 2021/22 compare?

Historical profitability



Average profit (per kg milk solids) in 2021/22 was above the long-term average for South Australia.

Strong profit results per farm (average \$497,085) across the state, were above the 10-year long term average of \$332,615, but down on the average of \$700,440 (adjusted for inflation) in 2020/21.

Expectations for profit in 2022/23

Participant farmers were generally optimistic in their outlook for farm business returns in the coming 12 months with 64 per cent of participants expecting better returns in 2022/23, and the remaining 36 per cent expecting returns to remain stable. Input costs were identified by participants as the greatest risk to their business followed by milk price and their ability to maintain homegrown feed production on farm.

Milk price

Milk price declined marginally from 2020/21. Milk income contributed on average, 85 per cent of gross farm income with a 2 per cent increase in livestock trading contribution to gross farm income on the previous year.



South Australia ↓ 0.3%
to \$7.59/kg MS

Greenhouse gas emissions

The average carbon footprint for South Australian dairy farm participants was 3,693 tonnes of carbon dioxide equivalents per farm in 2021/22. Over the last five years, larger herd sizes and greater milk production per farm have contributed to increasing average greenhouse gas emissions while emissions intensity has decreased since 2019/20.



SOUTH AUSTRALIA OVERVIEW

State-wide, average profitability in South Australia was positive and well above the 10-year long term average. Strong prices received for milk and livestock generally enabled farm businesses to manage the impact of higher costs.

Profitability was constrained by the late autumn break eating into fodder reserves with fodder conservation also down on last year due to spring rainfall events impacting the ability of farms to conserve high quantities of quality homegrown feed.

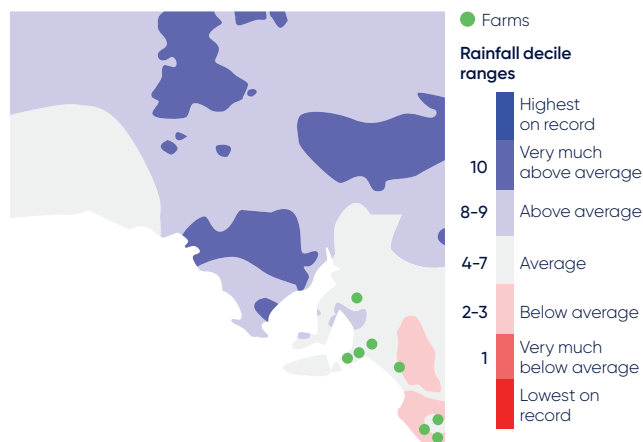
There were significant increases in costs, especially feed on the back of higher input cost for homegrown feed and higher unit prices on purchased feeds particularly concentrates. Increasing overhead costs, particularly for labour and depreciation also contributed to lower margins compared to 2020/21.

Dairying in South Australia



There were approximately **181** dairy farm businesses in SA that produced **490 million litres** or **6 per cent** of Australia's national milk production in 2021/22.

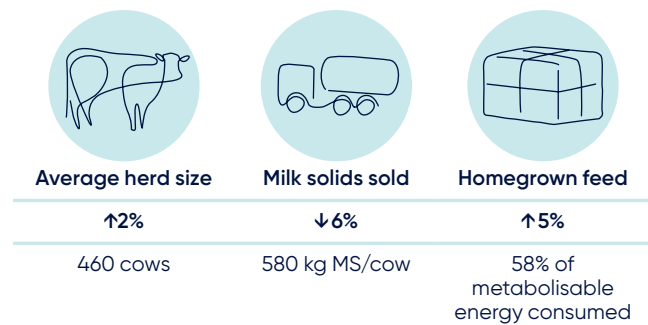
Dairy Farm Monitor Project farm locations and rainfall in 2021/22



The points on the map are representative of the general area where there are farms with some points having multiple participant farms in the same location.

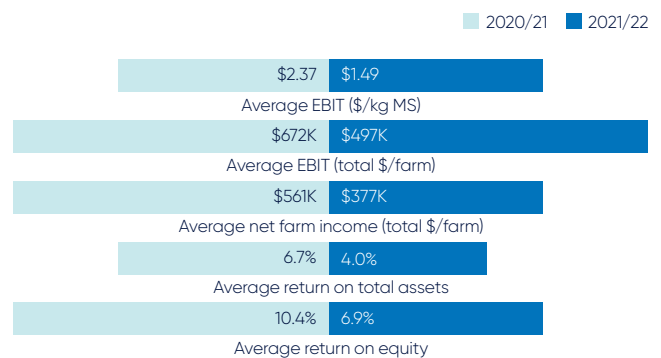
Physical farm characteristics

While the average herd size in South Australia increased to 460 cows, milk produced per cow declined from 618kgMS/cow to 580kgMS/cow. Farms grazed and conserved less feed on their milking areas this year on the back of average or below average rainfall on most participant farms combined with lower levels of fertiliser applied on average.



Profitability

In 2021/22, 93 per cent of all SA participants recorded a positive profit



2021/22 farm profitability has been influenced by:



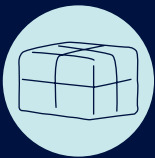
Stable average milk price of \$7.59/kg MS



↓ 3%
In herd costs to **\$0.36/kg MS**



↑ 4%
In shed costs to **\$0.24/kg MS**



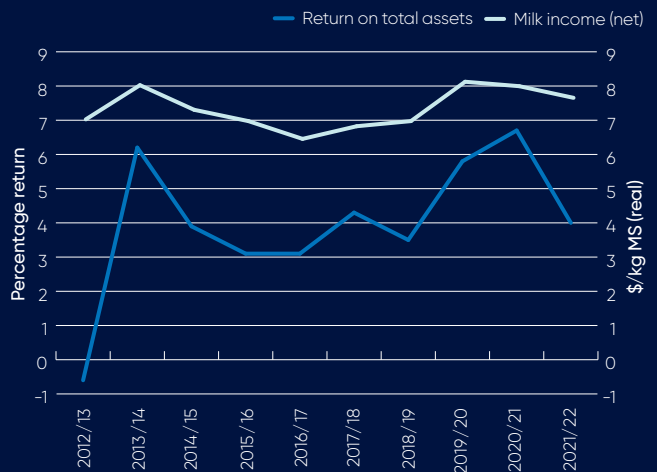
↑ 16%
In total feed costs to **\$3.67/kg MS**



↑ 20%
In overhead costs to **\$3.15/kg MS**

Increased costs across the state in most areas of the business reduced the benefit of positive livestock trading conditions and a stable milk price for the season. The delayed autumn break across much of the state impacted profitability. The state-wide average EBIT per farm was the third highest on record, accounting for inflation.

Return on total assets and milk price



PHYSICAL PARAMETERS AND SEASONAL CONDITIONS

The majority of farms received average or below average rainfall in 2021/22, largely impacted by the lack of autumn rain. The timing of rainfall events in spring also impacted the ability of farms to conserve high quality feed.

Seasonal conditions throughout the year resulted in a drop in homegrown feed on milking platforms, with a drop in fertiliser application rates to a five year low likely to have impacted this as well.

Farm systems have remained similar, although the average herd size increased in 2021/22 to the highest in the projects ten year history.

Significant rainfall in early winter impacted pasture growth which was further compounded by above average rainfall in late spring (Figure 1). This provided issues for participants in harvesting pasture either by direct grazing or through fodder conservation. Below average autumn rainfall resulted in reduced availability of homegrown feed for grazing and resulted in many farms utilising all their fodder reserves by year end.

Feed consumption and harvest

With lower homegrown feed availability across the state, the average tonnes of homegrown feed reduced by 0.3 t DM/ha (Figure 2). Whilst the proportion of fodder consumed in the diet increased there was a decline in concentrates as a proportion of the diet, largely on the back of increased concentrate prices.

The ability to grow and harvest feed may have also been impacted by lower fertiliser applications due to cost and restricted ability to utilise feed if it was grown in winter and the lack of autumn rain.

SA pasture based dairy production

Dairying in South Australia is predominantly pasture based, with 58 per cent of all consumed metabolisable energy home grown across participant farms. Spring and Autumn rainfall are important as is the availability of adequate water across irrigation areas.

Rainfall

Above average winter and spring rainfall in 2021 was followed by below average rainfall across autumn and these both impacted the physical and financial performance across South Australia. The preceding conditions as well as the conditions prevalent in a particular month influence feed availability and conditions to harvest pastures and crops as well as their timely renovation or sowing.

Figure 2 Estimated tonnes of homegrown feed removed

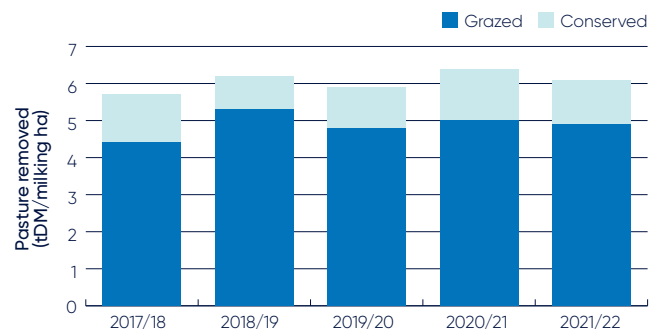
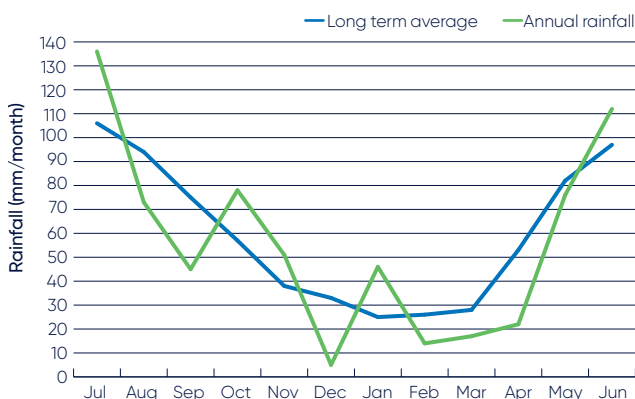


Figure 1 Monthly rainfall 2021/22

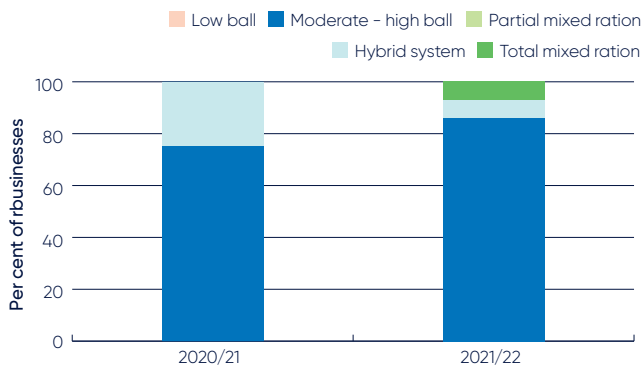


Feeding system

Moderate to high bail feeding systems were the most popular feeding system in 2021/22 (Figure 3) as was the case last year. The reduction in farms utilising a hybrid system from 2020/21 is largely due to a change in participant farms rather than showing a particular trend in the South Australian farming systems. This year there were 86 per cent of farms with a Moderate-High bail system compared to 75 per cent last year and 7 per cent utilising either a hybrid system or Total mixed ration.

South Australia is predominantly reliant on perennial pasture species, comprising approximately 76 per cent of pastures on average, with the remaining portion made up of annuals.

Figure 3 Type of feeding systems



Information on feeding systems was first collected in 2020/21 and the purpose is to capture the intensification of dairy feeding systems in South Australia over time. The type of feeding system employed reflects a longer-term decision made by the business operator to manage a certain type of feeding system, rather than a short term one to manage adverse seasonal conditions in a given year, i.e., wet soils management.

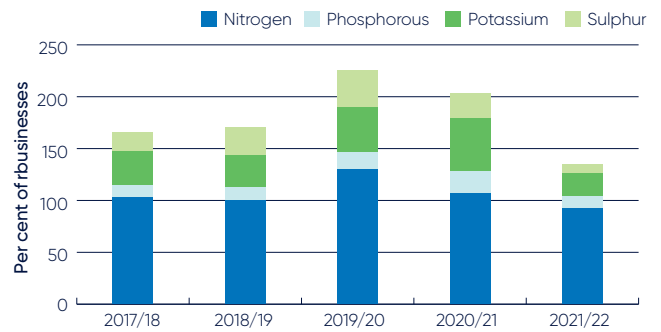
Fertiliser application

Total nutrient application on the milking area reduced considerably in 2021/22 to the lowest in five years. The significant increase in fertiliser prices and wet winter conditions combined with a dry autumn and very late autumn break resulted in farmers applying lower quantities of fertiliser.

In comparison to the previous year, Figure 4 shows that in 2021/22:

- Nitrogen applied was 92 kg/ha, a 14 per cent reduction
- Phosphorous applied was 12 kg/ha, a 43 per cent reduction
- Potassium applied was 22 kg/ha, a 57 per cent reduction
- Sulphur applied was 9 kg/ha, a 64 per cent reduction.

Figure 4 Nutrient application

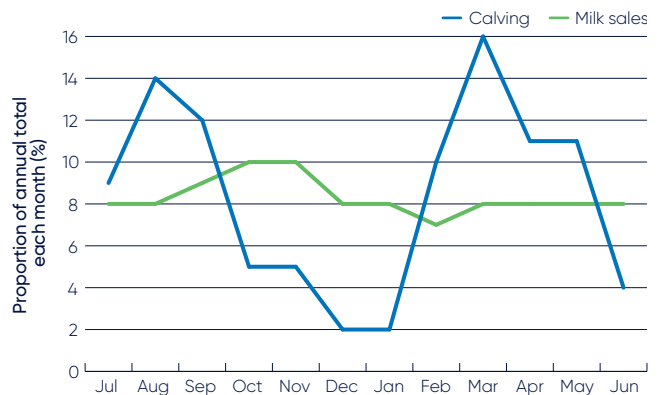


Milk solids sold

South Australian participant farms on average decreased the level of total milk production on farm due to reduced milk production per cow despite an increase in average herd size.

Milk production reflects the seasonal nature of calving. Calving pattern determines milk production and subsequently the milk payment system available to participant farms (Figure 5).

Figure 5 Monthly distribution of milk sales and calving



Calving pattern

South Australia is characterised by split calving (spring and autumn) as shown in Figure 5. The calving pattern determines the feed requirements on farm with some farms electing to calve year-round. The lowest proportion of cows calving occurs across the hotter summer months.



WHOLE FARM ANALYSIS

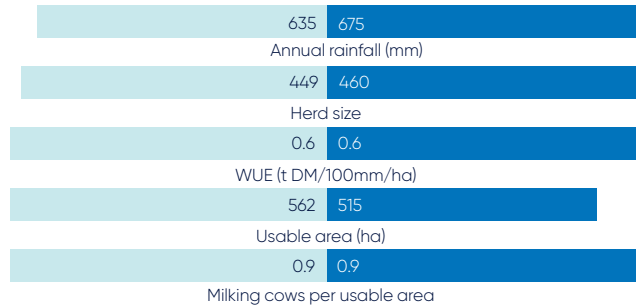
On average, farm profitability decreased in 2021/22. Earnings before Interest and Tax (EBIT) was positive for 93 per cent of participating farms.

The stable milk price and improved livestock trading conditions did not lead to increased profitability across the state. Milk income and gross farm income were both lower than 2020/21.

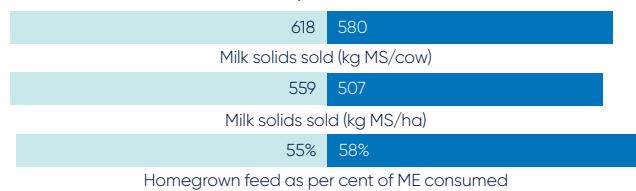
Variable costs increased by 14 per cent (primarily due to feed costs), with overhead costs higher by 20 per cent.

Physical parameters

Rainfall, area and cows



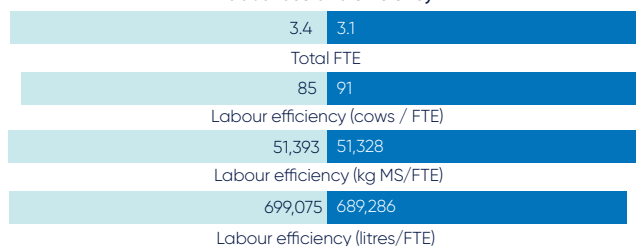
Milk production



Pasture production

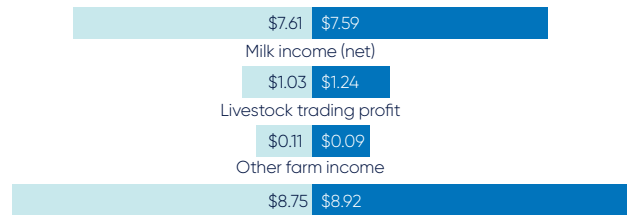


Labour use and efficiency



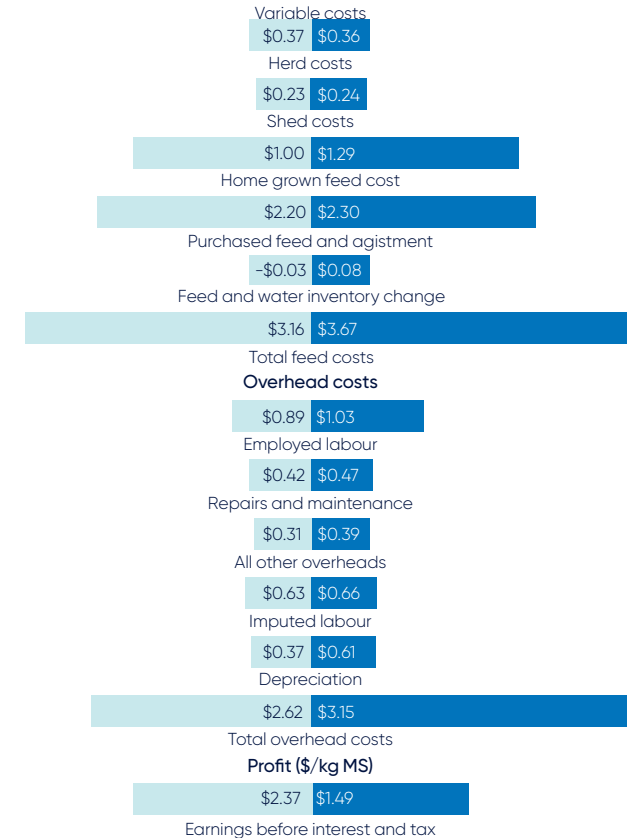
Financial parameters

Income (\$/kg MS)



Gross farm income

Costs (\$/kg MS)



Gross farm income

Higher gross farm income (nominal) was recorded in 2021/22 than the previous year. When accounting for inflation, it is the fourth highest over the 10 years of the DFMP. The key drivers were a stable milk price and increased livestock trading profit.

Variable costs

Variable costs increased by \$0.52/kg MS with higher homegrown feed costs being the largest component followed by purchased feed costs.

Homegrown feed costs increased by \$0.29/kg MS with fertiliser contributing \$0.09/kg MS, pasture and cropping up \$0.10/kg MS and fuel & oil and irrigation costs contributing a further \$0.03 and \$0.05/kg MS respectively.

Purchased feed costs also increased, largely on the back of higher concentrate prices and an increased reliance on agistment on participant farms.

The reduced conservation of fodder across spring combined with challenging conditions in autumn resulted in half of the farms drawing down on fodder reserves over the course of the year, while the other half were able to build feed inventory by year end.

Whilst shed and herd costs remained similar to last year shed power increased on average. Energy efficient technology (mostly solar) was adopted on some farms to mitigate increasing grid energy costs.

Overhead costs

Total overhead costs increased on average by 20 per cent in 2021/22.

Increased spending on employed labour and increased depreciation costs accounted for \$0.14 and \$0.24/kg MS respectively.

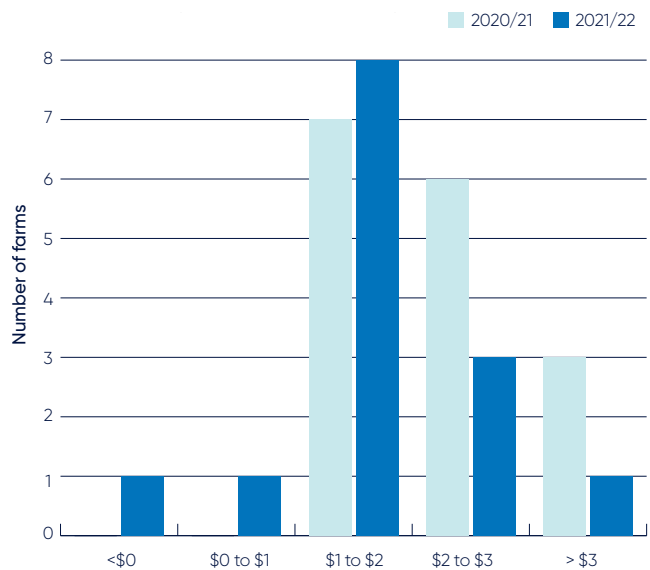
The majority of farms increased the hourly rate for employed labour with wage rates and availability of labour frequently raised by farmers as a prominent issue. A number of participant farms invested in labour productivity technologies in the 2021-22 year in an attempt to offset these rising costs.

The high value of assets on some farms, including considerable infrastructure investment in 2021/22 has seen an increase in the non-cash cost of depreciation. Some of this increase is due to the separation of significant buildings on farms in 2021/22 to ensure depreciation is being captured accurately and allowing sufficient allocation to asset replacement in the future.

Earnings before interest and tax

In 2021/22 93 per cent of participants had a positive EBIT (Figure 6). Average EBIT per farm (total dollars) was the third highest in the 10 years of the DFMP, accounting for inflation. Average EBIT (\$/kg MS) was lower year-on-year and again the third highest on record, accounting for inflation.

Figure 6 Average EBIT per kg MS



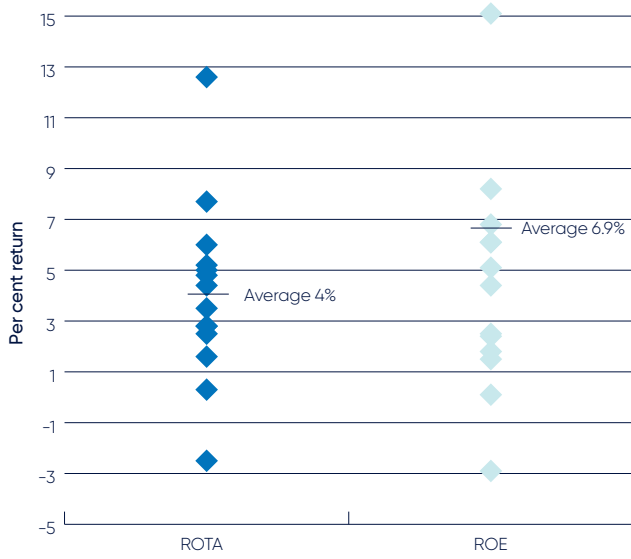
Return on total assets and equity

A positive return on total assets (ROTA) was recorded for 93 per cent of participants (Figure 7). In 2021/22 average ROTA reduced to 4.0 per cent compared to 6.7 per cent the previous year. The lower returns were a result of lower total EBIT combined with increasing values on total assets managed across participant farms.

Average return on equity (ROE) in 2021/22 decreased to 6.9 per cent relative to the previous year at 10.4 per cent. Equity levels increased on the majority of farms during the last 12 months.

With the cost of financing lower than the returns from accessing additional assets (e.g. land and infrastructure upgrades), half of the participants recorded higher ROE than ROTA meaning they have been able to grow their business.

Figure 7 Average returns ROTA and ROE



* One farm operates with mainly leased assets and has a very high ROE of 39.5. Dot point is not represented on graph due to scaling.



BUSINESS CONFIDENCE SURVEY

Participant farmers were confident in their outlook for farm business returns in the coming 12 months (2022/23).

All participant farms expected milk price to increase or remain stable with the majority of farms expecting milk production to remain stable or increase.

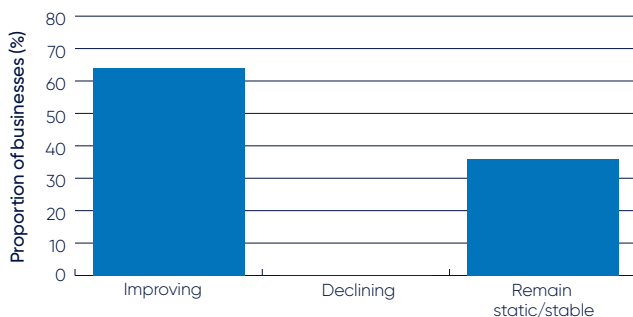
Input costs was the major issue listed for the coming 12 months with milk price being the most significant issue for the coming 5 years.

In 2022/23 costs were expected to increase across most categories except irrigation and repairs and maintenance, which are anticipated to remain stable.

Expectations for business profit 2022/23

The participant survey considers different aspects of farming, from climate outlook to expectations about market conditions for dairy products. Expectations for business profit in the coming year were generally positive with 64 per cent of farms expecting an increase in returns and the remaining 36 per cent expecting returns to remain stable (Figure 8).

Figure 8 Expected change to farm business profit in 2022/23

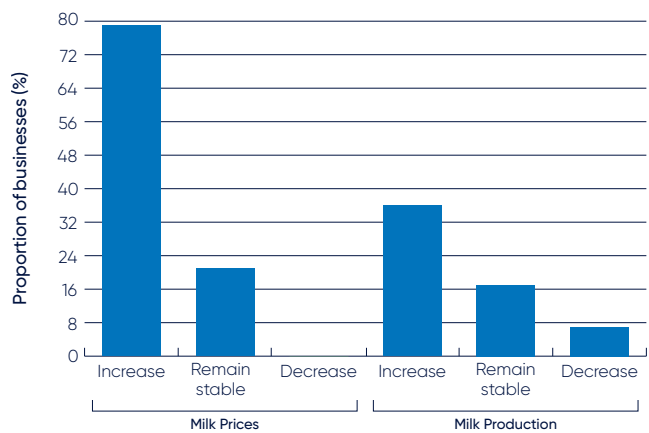


Price and production expectations – milk

Participants were confident in their outlook for milk price, and milk production for 2022/23. This is mainly due to the timing of milk price announcements (1 June), with farmers having more informed choices on their milk factory at the time of the DFMP survey (August–October 2022).

The majority of respondents were expecting milk price to increase with the remaining 21 per cent expecting it to remain stable. Around 57 per cent were expecting milk production to remain stable while 36 per cent expected it to increase in the coming year. Only 7 per cent predicted milk production would decrease in 2022/23 (Figure 9).

Figure 9 Producer expectations of milk prices and production in 2022/23

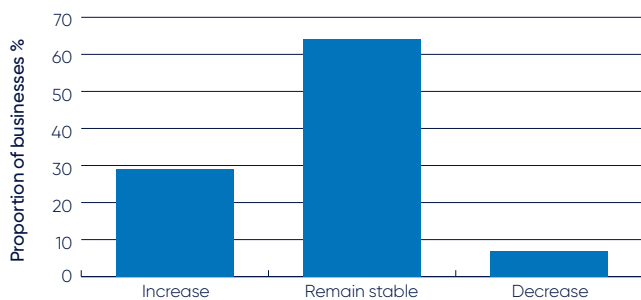


Production expectations – fodder

Fodder production in 2022/23 was expected to remain stable for 64 per cent of participant farms with a further 29 per cent expecting an increase in fodder after the impacts of frequent rainfall events in spring of 2021/22 caused a drop in fodder production on a number of farms (Figure 10).

Current spring rainfall is predicted to once again impact the ability of participant farms to harvest high quality fodder.

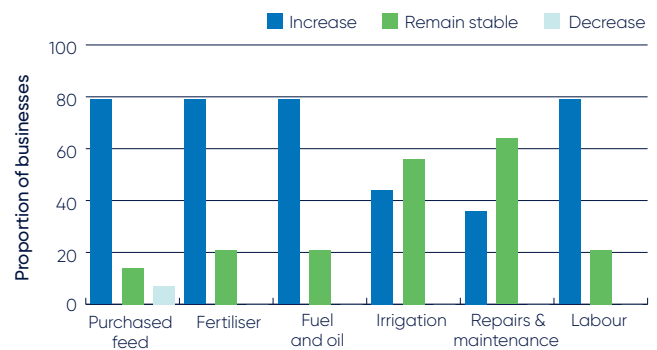
Figure 10 Producer expectations of fodder production in 2022/23



Cost expectations

Participants expected the majority of input costs to rise in 2022/23 with 79 per cent of respondents expecting increases in purchased feed, fertiliser, fuel and oil, and labour (Figure 11). Irrigation costs and repairs and maintenance were expected to stay stable with many farms having performed significant catch-up work on repairs and maintenance in 2021/22.

Figure 11 Producer Expectations of costs for the dairy industry in 2022/23



Comments from participants

Respondents indicated concern for power prices and reliability with some expecting power outages to impact their business. Others noted that businesses need to adapt to reducing carbon emissions and that there should be a consistent way of benchmarking this across the industry.

Another key concern was around rising wage rates and overall labour expenses and availability. A number of participants have begun investing in or investigating technologies in an attempt to improve labour efficiency and reduce overall labour costs in their businesses.

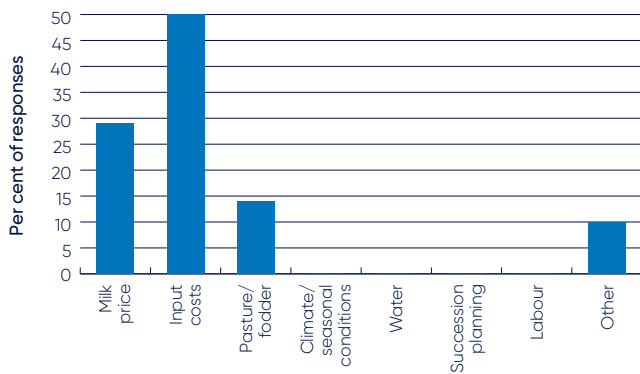
ISSUES OF IMPORTANCE TO DAIRY BUSINESSES

Participants were asked to rank issues based on the level of importance to their business – with a ranking of (1) being most important and (7) being least important. The results are shown in Figure 12 for the short-term issues and Figure 13 for medium term issues.

Short term issues – Next 12 months

The most important issue in the coming 12 months was input costs with 50 per cent of respondents ranking this as number 1 which was not surprising given the increase in variable and overhead costs in the past year. Milk price, ranked number 2 by 29 per cent of respondents, was then ahead of pasture and fodder production (at 14 per cent) as being a major issue.

Figure 12 Major issues for individual businesses – 12 month outlook

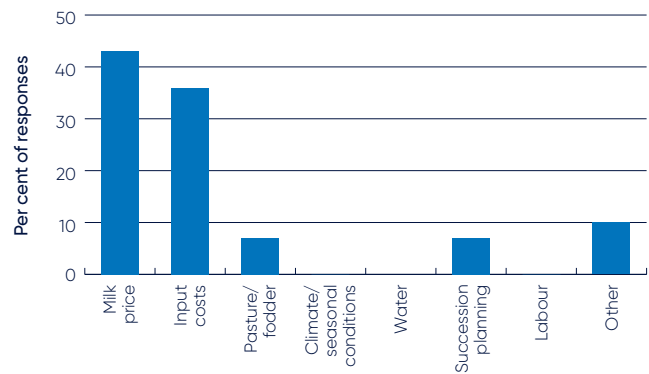


Medium to long term issues – Next five years

Milk price remains the major consideration for participants farms as was the case in 2020/21 although input costs were noted as an increased consideration over the coming five years.

Milk price ranked number 1 with 43 per cent of respondents followed by input costs at 36 per cent. A number of participant farms ranked input costs as number one but mentioned increasing labour costs as part of the conversation which is why labour has not been ranked independently as a consideration. It is worth noting that a number of South Australian farms undertook infrastructure changes on farm with the aim of improving labour efficiency and reducing overall labour costs in their businesses.

Figure 13 Major issues for individual businesses – 5 year outlook



2021/22 GREENHOUSE GAS EMISSIONS

The average carbon footprint for South Australian farm monitor farms was 3,693 tonnes of carbon dioxide equivalents (t CO₂-e) per farm in 2021/22.

Methane from cow rumination (enteric) accounted for an average of 62 per cent of on-farm emissions.

Larger herd sizes and greater total farm milk production have contributed to the trend of increased greenhouse gas (GHG) emitted per farm over the last 5-years.

Total emissions

Over the last five years, average GHG emissions have been trending upwards, mostly due to larger herd sizes and greater milk production per farm. In 2021/22, the average carbon footprint (net GHG emissions) for SA participants was estimated to be 3,693 t CO₂-e/farm (Figure 14).

In 2021/22, there was a decrease in methane emissions per farm, combined with decreases in pre-farm emissions (fertiliser manufacture, production of purchased fodder, grain and concentrates), nitrous oxide emissions (gas produced from wastes – dung/urine, applied fertiliser and effluent ponds), resulting in a decrease in average net emissions since last year. There was a marginal increase in carbon dioxide emissions from fossil fuel consumption (electricity or petrochemicals) whilst carbon capture from trees was not noted as an offset on any of the participating farms.

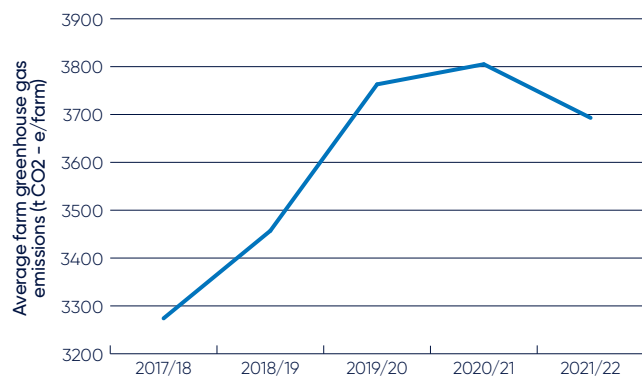
Enteric methane accounted for approximately 62 per cent of emissions and is sensitive to changes in livestock weights and numbers on individual farms.

High fertiliser prices and seasonal conditions saw the reduced use of fertiliser on farm. Farms are also increasing their adoption of alternative energy sources such as solar power. All these factors have played a role in the declining trend for farm emissions since 2019/20.

Emissions intensity

The emissions intensity allocated to milk production (once meat production is considered), has fluctuated over the five years but was lower in 2021/22 than the previous years with the exception of 2020/21 (Table 1). Although GHG emissions have increased over this period, emissions intensity has declined as average milk production has increased. Regional and farm variation was also observed over this period. These averages reflect the profiles of the participating farms and should not be taken as representative of the dairy industry.

Figure 14 Estimated average GHG emissions between 2017/18 and 2021/22 (CO₂ equivalent)



NOTE: Greenhouse gas emission estimates are calculated using the Australian Dairy Carbon Calculator embedded within DairyBase.

Changes to the emission accounting framework in 2021-22 include new factors for methane, nitrous oxide, fertiliser, purchased feeds, electricity and fuel. The scope considered other livestock on dairy farms (dairy beef) and the allocated proportion of GHG to meat production. Carbon capture and storage from trees was recorded more accurately in 2021/22. Data from all five years was analysed using the 2021/22 accounting framework.

Table 1 Estimated average GHG emissions and intensity between 2017/18 and 2021/22 (CO² equivalent)

Emission source	Units	17/18	18/19	19/20	20/21	21/22
Sample size		19	20	18	16	14
Methane	t CO ² -e/farm	2,302	2,453	2,618	2,680	2,652
Pre-farm	t CO ² -e/farm	370	360	465	451	388
Nitrous oxide	t CO ² -e/farm	345	362	415	400	377
Carbon dioxide	t CO ² -e/farm	257	281	265	274	277
Tree carbon	t CO ² -e/farm	0	0	0	0	0
Net GHG emissions	t CO ² -e/farm	3,274	3,457	3,763	3,805	3,693
Emissions intensity	t CO ² -e/FPCM (milk)	0.88	0.88	0.89	0.85	0.88
Emissions intensity	t CO ² -e/t MS (milk)	12.4	12.4	12.6	12.0	12.3
Emissions intensity	t CO ² -e/kg lwt (meat)	4.2	4.2	4.2	4.0	4.5

HOW DOES 2021/22 COMPARE

Stable milk prices in 2021/22 and favourable livestock trading conditions helped buffer the impact of higher costs.

Strong profit results per farm (average \$497,085) across the state, were well above the 10-year long term average of \$332,615.

The comparatively lower EBIT (compared to 2020/21) over a larger asset base decreased the resulting return on total assets.

Farm profit (EBIT) in 2021/22 was the third highest (accounting for inflation) since the start of the DFMP in 2012/13 (Figure 15). Average EBIT was \$497,085 in 2021/22, compared to the long-term average of \$332,615. Net farm income was \$376,988 in 2021/22, compared to the long-term average of \$208,739.

Average ROTA was 4.0 per cent in 2021/22, decreasing from 6.7 per cent the previous year (FIGURE 16), which is the fifth highest in the last 10 years. The average ROE decreased to 6.9 per cent in 2021/22 from 10.4 per cent in 2020/21. This is compared to the long term average of 3.9 per cent.

Figure 15 Farm profitability between 2011/12 and 2021/22

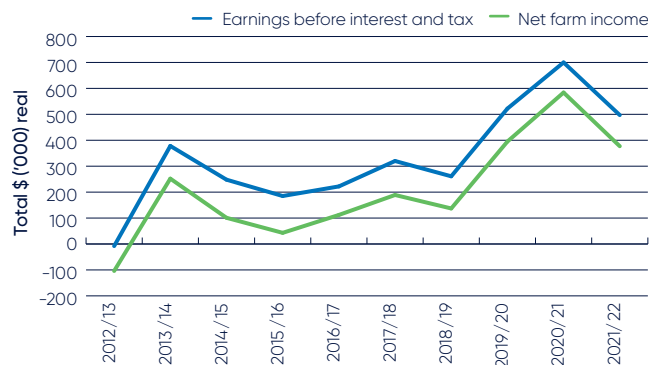
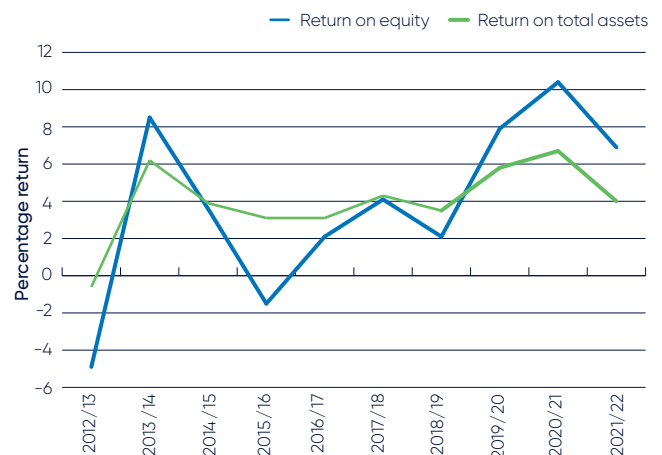


Figure 16 Whole farm performance between 2011/12 and 2021/22





Appendices

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	13,011	15,749	1,880	2,259	1,196	2,661	172	194	19,114

Liabilities			Equity	
	Liabilities per usable hectare		Equity per usable hectare	Average equity
	\$/ha	Liabilities per milking cow	\$/ha	%
		\$/cow		
Average	4,246	4,461	14,868	77.5

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 (\$/kgMS)	Real (\$/kgMS)	Nominal (\$/kgMS)	Real (\$/kgMS)	Nominal (\$/kgMS)	Real (\$/kgMS)	Nominal (\$/kgMS)	Real (\$/kgMS)	Nominal (\$/kgMS)	Real (\$/kgMS)	Nominal (\$/kgMS)	Real (\$/kgMS)
2012/13	5.83	6.97	6.40	7.65	0.32	0.38	0.28	0.33	2.96	3.54	3.56	4.25
2013/14	6.83	7.96	7.74	9.02	0.30	0.35	0.26	0.30	3.04	3.54	3.61	4.21
2014/15	6.35	7.23	7.03	8.01	0.29	0.33	0.22	0.25	3.28	3.74	3.79	4.32
2015/16	6.15	6.92	7.10	7.99	0.34	0.38	0.24	0.27	3.13	3.52	3.71	4.17
2016/17	5.78	6.39	6.75	7.46	0.40	0.44	0.27	0.30	2.49	2.75	3.16	3.49
2017/18	6.24	6.77	7.08	7.68	0.31	0.34	0.29	0.31	2.80	3.04	3.40	3.69
2018/19	6.46	6.91	7.32	7.83	0.29	0.31	0.24	0.26	3.30	3.53	3.83	4.10
2019/20	7.62	8.06	8.64	9.14	0.36	0.38	0.26	0.27	3.53	3.73	4.14	4.38
2019/20	7.61	7.93	8.75	9.12	0.37	0.39	0.23	0.24	3.16	3.29	3.76	3.92
2021/22	7.59	7.59	8.92	8.92	0.36	0.36	0.24	0.24	3.67	3.67	4.28	4.28
Average		7.27		8.28		0.37		0.28		3.43		4.08

Note: 'Real' dollar values are the nominal values converted to 2021/22 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 A9 Historical data – average farm income, costs and profit per kilogram of milk solids (continued)

Year	Overhead costs						Profit							
	Cash overhead costs		Non-cash overhead costs		Total overhead costs		Earnings before interest and tax		Interest and lease charges		Net farm income			
	Nominal (\$/kgMS)	Real (\$/kg MS)	Nominal (\$/kgMS)	Real (\$/kg MS)	Nominal (\$/kgMS)	Real (\$/kg MS)	Nominal (\$/kgMS)	Real (\$/kg MS)	Nominal (\$/kgMS)	Real (\$/kg MS)	Nominal (\$/kgMS)	Real (\$/kg MS)	Return on total assets %	Return on equity %
2012/13	1.55	1.85	1.60	1.91	3.15	3.76	(0.31)	(0.37)	0.53	0.63	(0.84)	(1.00)	-0.6%	-4.9%
2013/14	1.54	1.79	1.31	1.53	2.85	3.32	1.27	1.48	0.52	0.61	0.75	0.87	6.2%	8.5%
2014/15	1.50	1.71	1.03	1.17	2.52	2.87	0.72	0.82	0.55	0.63	0.16	0.18	3.9%	3.6%
2015/16	1.60	1.80	1.00	1.12	2.60	2.92	0.79	0.89	0.57	0.64	0.22	0.25	3.1%	-1.5%
2016/17	1.68	1.86	1.04	1.15	2.71	2.99	0.88	0.97	0.47	0.52	0.40	0.44	3.1%	2.1%
2017/18	1.61	1.75	0.89	0.96	2.50	2.71	1.18	1.28	0.54	0.59	0.65	0.70	4.3%	4.1%
2018/19	1.50	1.61	0.90	0.96	2.40	2.57	1.09	1.17	0.49	0.52	0.60	0.64	3.5%	2.1%
2019/20	1.70	1.80	0.95	1.01	2.66	2.81	1.84	1.95	0.46	0.48	1.39	1.47	5.8%	7.9%
2020/21	1.62	1.69	1.00	1.04	2.62	2.73	2.37	2.47	0.41	0.43	1.96	2.04	6.7%	10.4%
2021/22	1.88	1.88	1.27	1.27	3.15	3.15	1.49	1.49	0.42	0.42	1.07	1.07	4.0%	6.9%
Average		1.77		1.21		2.98		1.21		0.55		0.67	4.0%	3.9%

Note: 'Real' dollar values are the nominal values converted to 2021/22 dollar equivalents by the consumer price index (CPI) to allow for inflation.

Table A10 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)
2012/13	340	141	0.70	320	1.2	527	622	4.8	1.2	51%	304	363
2013/14	526	164	0.60	453	1.4	469	660	7.9	0.9	57%	343	400
2014/15	529	159	0.70	362	1.3	581	738	-11.5	4.1	44%	364	415
2015/16	447	131	0.70	355	1.4	586	751	6.4	1.4	48%	366	412
2016/17	565	200	0.60	394	1.3	539	630	5.7	1.9	64%	304	336
2017/18	527	205	0.60	399	1.1	569	628	4.4	1.3	54%	340	369
2018/19	573	226	0.63	414	1.1	574	600	5.3	0.9	61%	485	519
2019/20	592	238	0.61	446	1.0	577	579	4.8	1.1	57%	505	535
2020/21	562	256	0.6	449	0.9	618	559	5.0	1.4	55%	412	429
2021/22	515	225	0.6	460	0.9	580	507	4.9	1.2	58%	455	427
Average	518	195	0.6	405	1.2	562	627	3.8	1.5	55%		420

*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 A Glossary of terms, abbreviations and standard values

All other farm income	Income to the farm from all sources except milk. Includes livestock trading profit, dividends, interest payments received, and rent from farm houses.	Feeding Systems	<p>Low bail Low bail is defined by the one-tonne annual cap of grain or concentrates fed in the dairy bail – i.e. cows are fed up to one tonne of grain and concentrate in the dairy at milking time throughout lactation and livestock graze pasture all year round.</p> <p>Moderate – High bail The level of grain or concentrate fed in the bail is more significant than one tonne per annum, and livestock graze pasture all year round.</p> <p>Partial mixed ration In the partial mixed ration (PMR) system, livestock animals graze on pasture for most of the year, if not all of the year, while being fed a PMR on a feed pad.</p> <p>Hybrid system Hybrid systems are classified as grazing pasture for fewer than nine months of the year while feeding a partial mixed ration on a feed pad with grain or concentrates.</p> <p>Total mixed ration A total mixed ration or TMR is classified by zero-grazing, where cows are contained and fed a TMR throughout the year.</p>
Allocation	Water that is actually available to use or trade in any given year, including new allocations and carryover. Previously known as temporary water. Full allocation means irrigators receive 100 per cent of their HRWS.	Finance costs	See interest and lease costs.
Allocation trade	The transfer of a volume of allocation water between a seller and buyer. Water is traded within a current irrigation season. Previously this was known as trading of temporary water entitlement and some irrigators still use this term.	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, often only applicable to land value.	Grazed pasture	Total metabolisable energy available is the sum of metabolisable energy from all feed sources except pasture, calculated as (weight (kg) x dry matter content (DM per cent) 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, livestock trading and other income such as income from grants and rebates.
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 structure	Variable costs as a percentage of total costs, where total costs equal variable costs plus overhead costs.	Herd costs	Cost of artificial insemination (AI) and herd tests, animal health and calf rearing.
Concentrates	Refers to feeds with a concentrated source of energy such as grains, pellets and other grain mixes.	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.
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 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 kg MS. Measures 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).	Liability	Money owed to someone else, e.g., family or a financial institute such as a bank.
Equity per cent	Total equity as a percentage of the total assets owned. The proportion of the total assets owned by the business.		
Feed costs	Cost of fertiliser, irrigation (including effluent), hay and silage making, fuel and oil, pasture improvement, fodder purchases, grain/concentrates, agistment and lease costs associated with any of the above costs, and feed inventory change.		
Feed inventory change	An estimate of the feed on hand at the start and end of the financial year to capture feed used in the production of milk and livestock.		

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.
Milk income	Income from the sale of milk. This is net of compulsory levies and charges.
Milking area	The area of land grazed by milking cows to produce milk.
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 rent 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 noncash 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.
Top 25%	Regional or State average for the Top 25% of participant farms ranked by return on total assets; can also be referred to as the top group, top performers within a region or the state.
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 use efficiency	Homegrown 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 change).

Water inventory change	An estimate of the values irrigation water on hand at the start and end of the financial year to capture water used in the production of pasture and crops.
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List of abbreviations

AI	Artificial insemination
CH ₄	Methane
CO ₂	Carbon dioxide
CO ₂ -e	Carbon dioxide equivalent
CoP	Cost of production
DFMP	Dairy Farm Monitor Project
DM	Dry matter of feed stuffs
DJPR	Department of Jobs, Precincts and Resources, Victoria
EBIT	Earnings before interest and tax
FPCM	Fat and protein corrected milk
FTE	Full time equivalent
ha	Hectare(s)
hd	Head
HRWS	High Reliability Water Shares
kg	Kilograms
LRWS	Low Reliability Water Shares.
ME	Metabolisable energy (MJ/kg DM)
MJ	Megajoules of energy
ML	Megalitres
mm	Millimetres. 1 mm is equivalent to 4 points or 1/25th of an inch of rainfall
MS	Milk solids (protein and fat)
N ₂ O	Nitrous oxide
Q1	First quartile, i.e., the value of which one quarter, or 25 per cent, of data in that range is less than the average
Q3	Third quartile, i.e., the value of which one quarter, or 25 per cent, of data in that range is greater than the average
ROTA	Return on total assets
ROE	Return on equity
t	Tonne = 1,000 kg

Standard values

Pasture consumption

The pasture consumption calculation assumes 11 ME for homegrown feed.

Livestock values

The standard values used to estimate the inventory values of livestock were determined by breed and liveweight.

Example values for Friesians were:

Category	Opening value (\$/hd)	Closing value (\$/hd)
Mature cows (550kg)	\$2,200	\$2,200
2-year-old heifers	\$1,650	\$2,200
1-year old heifers	\$825	\$1,650
21/22 calves		\$825
Mature bulls	\$3,300	\$3,300

Imputed owner/operator and family labour

In 2021/22, the imputed owner/operator and family labour rate was \$34/hr based on a full time equivalent (FTE) working 48 hours/week for 50 weeks of the year.



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