Dairy Australia

Dairy Farm Monitor Project

Western Australia Annual Report 2023/24

Delivering for Dairy

Acknowledgements

Participants

Western Dairy would like to gratefully acknowledge the cooperation, patience and goodwill of the farmers who willingly supplied their farm information.

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Report

The report was prepared by Sarah Lang (Regional Finance Hub) in conjunction with Dairy Australia.

Contributors/data collectors

We acknowledge the work of dairy consultants Sarah Lang, Kirk Reynolds, Dan Parnell, Colin Bosustow and Steve Hossen who collected farm data, provided feedback and data validation.

We also acknowledge the work of Dairy Australia's farm analysts Fiona Smith and Kerry Kempton, who conducted the data checking, validation and analysis.

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 Western Australian project participants.

Further information

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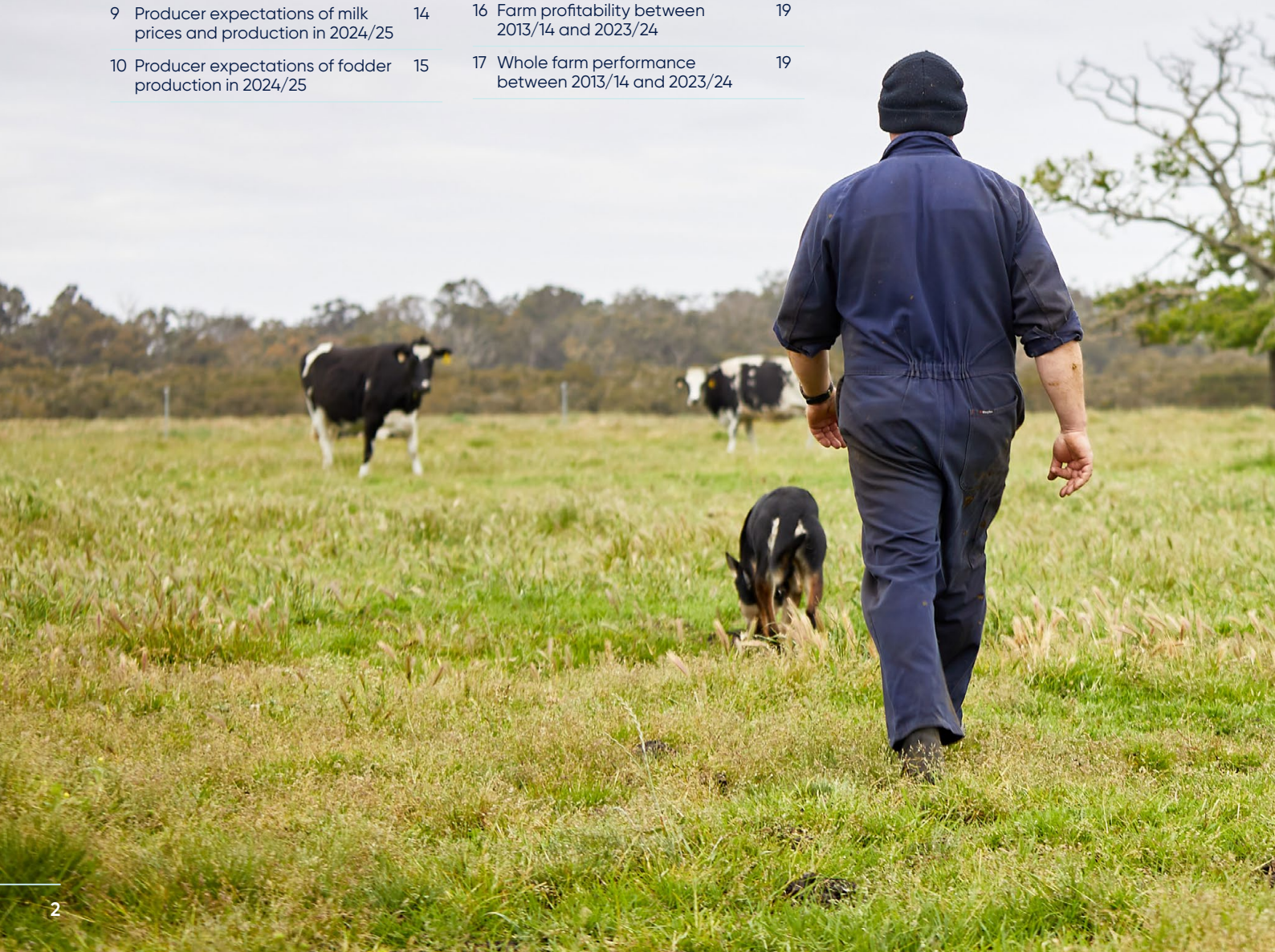
Contents

List of figures and tables

Figures

Tables



What's new in 2023/24

The Dairy Farm Monitor Report for 2023/24 includes some minor changes and updates from last year.

- The number of farms in the project increased by three to twenty six.
- "Homegrown feed as % of ME consumed" is now aligned with the DairyBase calculation and is homegrown feed consumed (including wastage) + grazed feed. Historically the calculation was homegrown feed fed (no wastage included) + grazed feed.
- Changes to ADCC estimates
  - Changes in emission factors, e.g. electricity-derived emissions have come down for most states, although diesel-derived emissions have increased. Similarly, some CH_4 and N_2O emission from fertiliser and waste management have decreased, while others have increased based on the most recent scientific results.
  - More accurate allocation of purchased feed-derived emissions to milk vs meat enterprise, based on where the purchased feed is fed on the farm. Any feed fed on the milking platform is allocated to the milk enterprise. Any feed fed on the support block is proportionally allocated to both enterprises based on the ratio of milk to meat produced. This change may increase meat emissions intensity for some farms.
  - In 2022/23 greater detail was collected about manure management at the dairy and feeding areas, fuel usage by contractors and trees, meaning historical data may not be comparable.

Executive summary

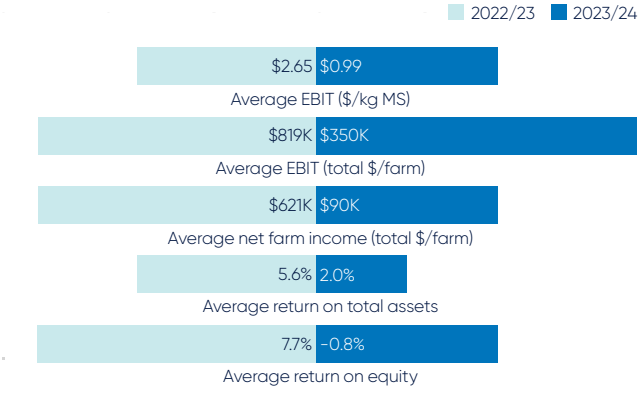
In 2023/24 the average Western Australia Dairy Farm Monitor profitability was the lowest in the 11-years of the project (accounting for inflation).

Average milk price increased to $9.54 per kilograms of milk solids ($/kg MS) or 69.0 cents per litre (c/L).

The increase in milk price was offset by higher input costs, mainly fodder and concentrate purchases. Fewer beef sales and continued low prices, reduced livestock trading profit to $1.16/kg MS (8.4c/L). Total Gross Farm income decreased to $10.75/kg MS or 77.7c/L in 2023/24 from $11.37 ($/kg MS) or 82.6c/L in 2022/23.

Only one participant recorded a higher ROE than ROTA meaning they were the only participant to grow their business in 2023/24.

Western Australia



A 3 per cent increase in the milk price was not sufficient to cover the increase in input costs, predominantly purchased feed, and lower livestock trading profit. Average EBIT declined 63 per cent from last year.

Average return on equity (ROE) in 2023/24 was negative 0.8 per cent in comparison to the previous year at 7.7 per cent. Equity levels decreased on 59 per cent of farms during the last 12 months due to negative EBIT.

Rainfall in 2023/24 was 30 per cent below the long-term average. A below average winter was followed by a dry spring which is the key growing period for pastures and crops. This impacted the physical and financial performance across Western Australia due to increased requirements for purchased fodder.

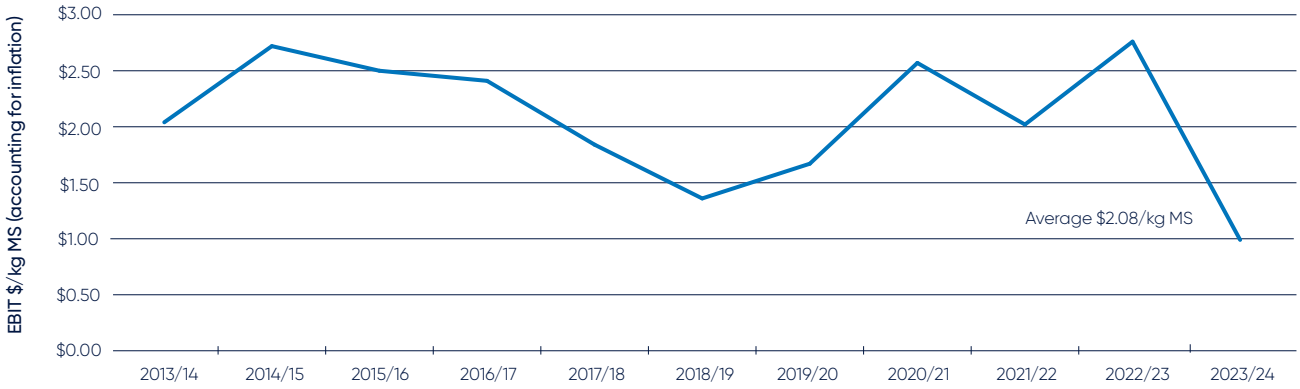
The amount of grazed pasture decreased by 0.5 t DM/milking ha to 3.1 t DM/milking ha and conserved feed decreased by 0.1 t DM/milking ha. Whilst the proportion of grazed feed consumed in the diet decreased by 13 per cent it was replaced by a 15 per cent increase in hay as a proportion of the diet.

Despite gross farm income being the third highest, profitability (average EBIT per kilogram of milk solids) was the lowest (accounting for inflation) in the 11-year history of the project.

A 36 per cent increase to finance and lease costs was driven by an increase in long term liabilities. This reduced net farm income to negative $0.12 ($/kg MS) or negative 0.8c/L compared to $1.84 ($/kg MS) or 13.4c/L in 2022/23.

How does 2023/24 compare?

Historical profitability



Average profit (per kg milk solids) in 2023/24 was $0.99/kg MS (7.1c/L) which was below the long-term average of $2.08/kg MS for Western Australia.

Profit results per farm (average $349,683) across the state, was lower than the long term average of $628,087, and the lowest in the 11 years of the project.

Milk price

Milk price increased by 3 per cent from 2022/23. Milk income contributed on average, 89 per cent of gross farm income. This increased 7 per cent from last year due to a lower livestock profit.

Western Australia ↑ 3%
to $9.54/kg MS 69.0 c/L

Expectations for profit in 2024/25

Participant farmers were more optimistic in their outlook for farm business returns in the coming 12 months than last year with 62 per cent of participants expecting better returns in 2024/25, up from 48 per cent in 2022/23 and only 4 per cent expecting a decline, down from 30 per cent in 2022/23. Milk price (46%) followed by input costs (23%) were identified by participants as the greatest risk to their business followed by climate/seasonal conditions (15%) and pasture/fodder (12%).

Greenhouse gas emissions

The average carbon footprint for Western Australian dairy farm participants was 4,593 tonnes of carbon dioxide equivalents per farm in 2023/24. Average net emissions have largely followed the trends of average milk production over the past five years with the reduction in average emissions from 2022/23 to 2023/24 largely being due to the drop in average total milk production across the participant farms.

Western Australia overview

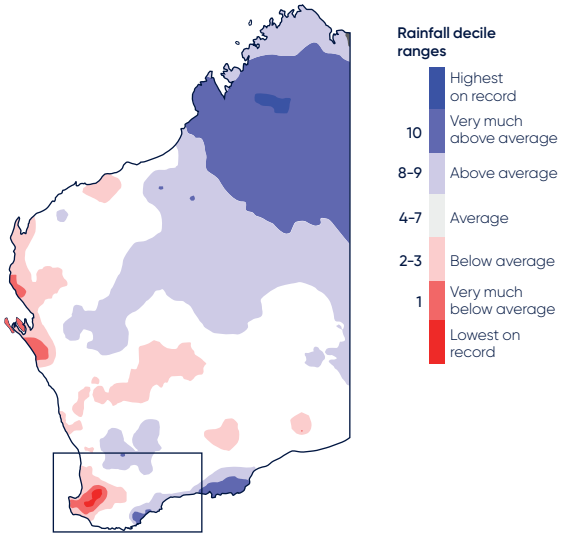
State-wide, average profitability in Western Australia was the lowest in the 11-years of the project with 69 per cent of participants recording a profit. Average profits were 63 per cent lower to $0.99/kg MS or 7.1c/L. Slightly higher prices received for milk was more than offset by the impact of higher costs and lower livestock profitability.

Profitability was constrained due to increases in input costs such fodder and concentrate purchases. Fodder conservation was also down in comparison to last year due to a dry growing season impacting fodder production. This impacted the ability of farms to conserve high quantities of quality homegrown feed.

Dairying in Western Australia

There were approximately **107 dairy farm businesses** in WA that produced **344 million litres** or **4 per cent** of Australia's national milk production in 2023/24.

Dairy Farm Monitor Project farm locations and rainfall in 2023/24



The box on the above map indicates the area where participant farms are situated.

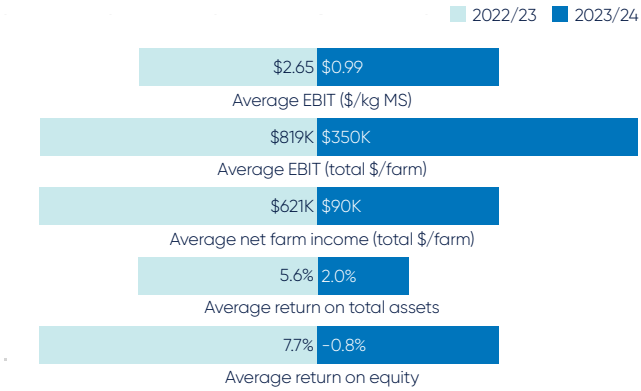
Physical farm characteristics

The average herd size of DFMP participants in Western Australia decreased to 478 cows, as did milk produced per cow dropping from 548kg MS/cow to 539kg MS/cow. Farms grazed less feed on their milking areas this year on the back of below average rainfall on most participant farms combined with lower levels of fertiliser applied on average due to low rainfall, resulting in a drop in overall homegrown feed.

Average herd size	Milk solids sold	Homegrown feed
↓2%	↓2%	↓8%
478 cows	539 kg MS/cow	60% of metabolisable energy consumed

Profitability

In 2023/24, 69 per cent of all WA participants recorded a profit



In 2023/24 farm profitability for the state has been influenced by:

↑3%
in average milk price to **$9.54/kg MS (69.0c/L)**

↓29%
in fertiliser costs to **$0.69/kg MS (5.0c/L)**

↑3%
in shed costs to **$0.36/kg MS (2.6c/L)**

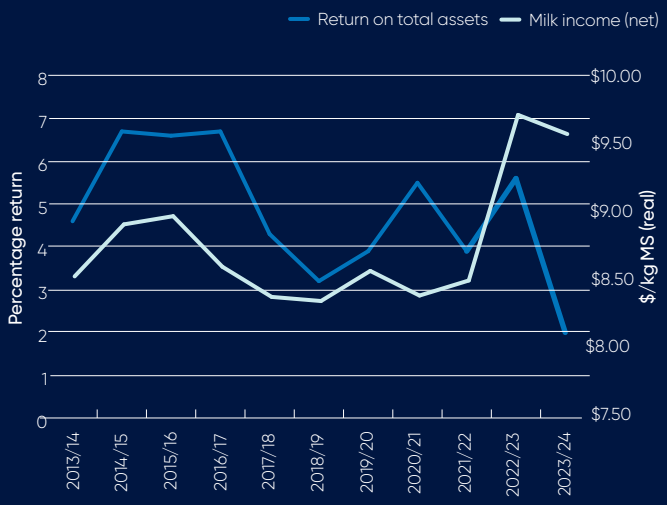
↑20%
in total feed costs to **$5.29/kg MS (38.3c/L)**

↑4%
in overheaad costs to **$3.78/kg MS (27.3c/L)**

A lower livestock profit and increased costs across the state in most areas of the business reduced the benefit of a slightly increased milk price for the season. The state-wide average EBIT per farm was the lowest on record, accounting for inflation.

A 36 per cent increase to finance and lease costs was driven by an increase in long term liabilities. This reduced net farm income to negative $0.12 ($/kg MS) or negative 0.8c/L compared to $1.84 ($/kg MS) or 13.4c/L in 2022/23.

Return on total assets and milk price



The milk price in $/kgMS (real) accounts for inflation.

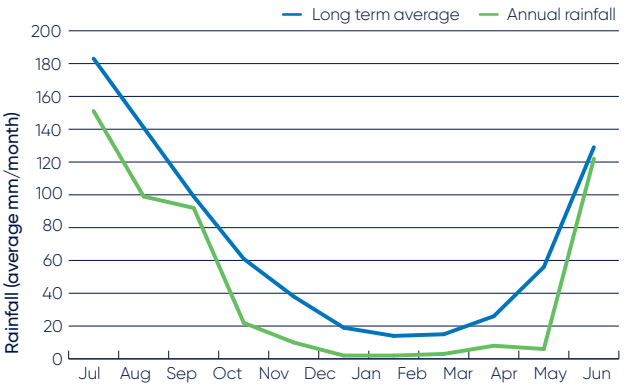
Physical parameters and seasonal conditions

All WA farms received below average rainfall in 2023/24. This resulted in low homegrown fodder production as well as increased hay prices due to lack of supply.

Lower than average rainfall throughout the year resulted in a drop in homegrown feed on milking platforms, with less spent on fertiliser as a result.

Farm systems have remained similar although the average herd size decreased to 478 in 2023/24 from 490 in 2022/23.

Figure 1 Monthly rainfall 2023/24



WA pasture based dairy production

Dairying in Western Australia is predominantly pasture based, with 60 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

Rainfall in 2023/24 was 30 per cent below the long-term average. A below average winter was followed by a dry spring which is the key growing period for pastures and crops. This impacted the physical and financial performance across Western Australia due to increased requirement for purchased fodder.

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.

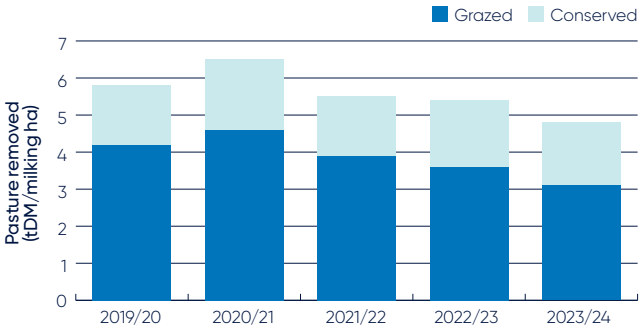
Feed consumption and harvest

Seasonal conditions impacted the ability to grow, graze and harvest feed with less homegrown feed availability across the state in comparison to last year. The amount of grazed pasture decreased by 0.5 t DM/milking ha to 3.1 t DM/milking ha and conserved feed decreased by 0.1 t DM/milking ha (Figure 2). Whilst the proportion of grazed feed consumed in the diet decreased by 13 per cent it was replaced by 15 per cent increase in hay as a proportion of the diet.

The ability to grow and harvest feed was impacted by a lower than average annual rainfall and farmers applied less fertiliser due to lack of growing season rainfall.

As a proportion of the diet, homegrown feed (grazed and conserved pasture) accounted for 60 per cent of the metabolisable energy consumed, compared to 65 per cent in the previous year.

Figure 2 Estimated tonnes of homegrown feed removed

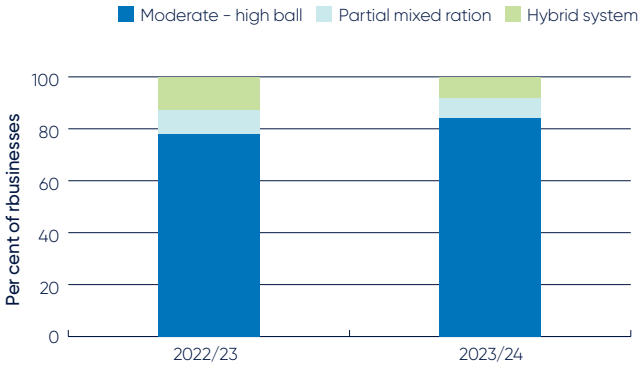


Feeding system

Moderate to high bail feeding systems were the most popular feeding system in 2023/24 (Figure 3). The increase in farms utilising a moderate-high bail ration system from 2022/23 is largely due to a change in participant farms rather than showing a particular trend in the West Australian farming systems. This year there were 85 per cent of farms with a moderate-high bail system and 8 per cent utilising either a hybrid system or partial mixed ration.

Western Australia is predominantly reliant on annual pasture species, comprising approximately 92 per cent of pastures on average, with the remaining portion made up of perennials.

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 Western 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 or drought.

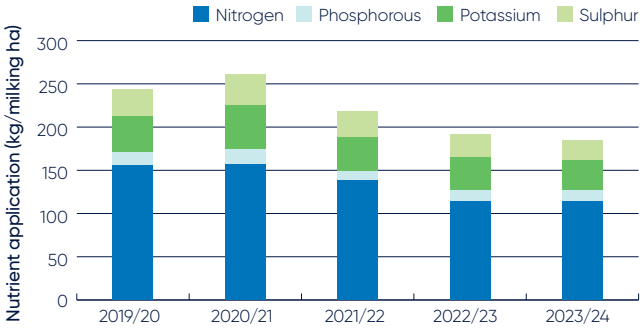
Fertiliser application

Total nutrient application on the milking area reduced by 4 per cent to 185 kg/milking ha. The lower than average rainfall resulted in farmers applying lower quantities of fertiliser.

In comparison to the previous year, Figure 4 shows that in 2023/24:

- Nitrogen applied was 114 kg/ha, same as last year.
- Phosphorous applied was 13 kg/ha, same as last year.
- Potassium applied was 35 kg/ha, an 8 per cent reduction.
- Sulphur applied was 23 kg/ha, a 15 per cent reduction.

Figure 4 Nutrient application

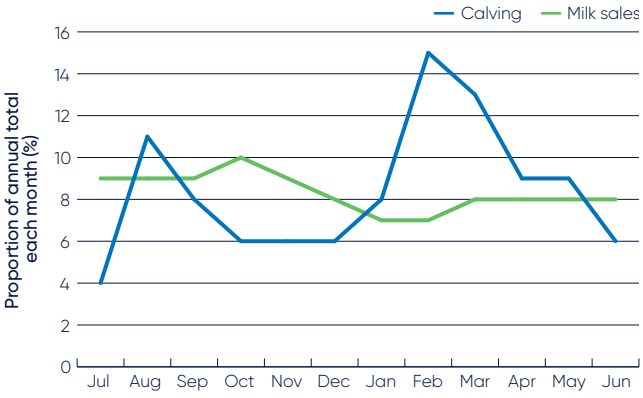


Milk solids sold

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).

Total milk production (kg/MS) declined on Western Australian participant farms due to a decrease in herd size, and a drop in per cow production.

Figure 5 Monthly distribution of milk sales and calving



Calving pattern

Western Australia is characterised by split calving (spring and autumn) as shown in Figure 5. Many factors influence choice of calving pattern on individual farms, including matching feed supply with animal demand, receiving seasonal milk price, rainfall and irrigation, ease of management and herd fertility management.

The lowest proportion of cows calving occurs across July and December.

Whole farm analysis

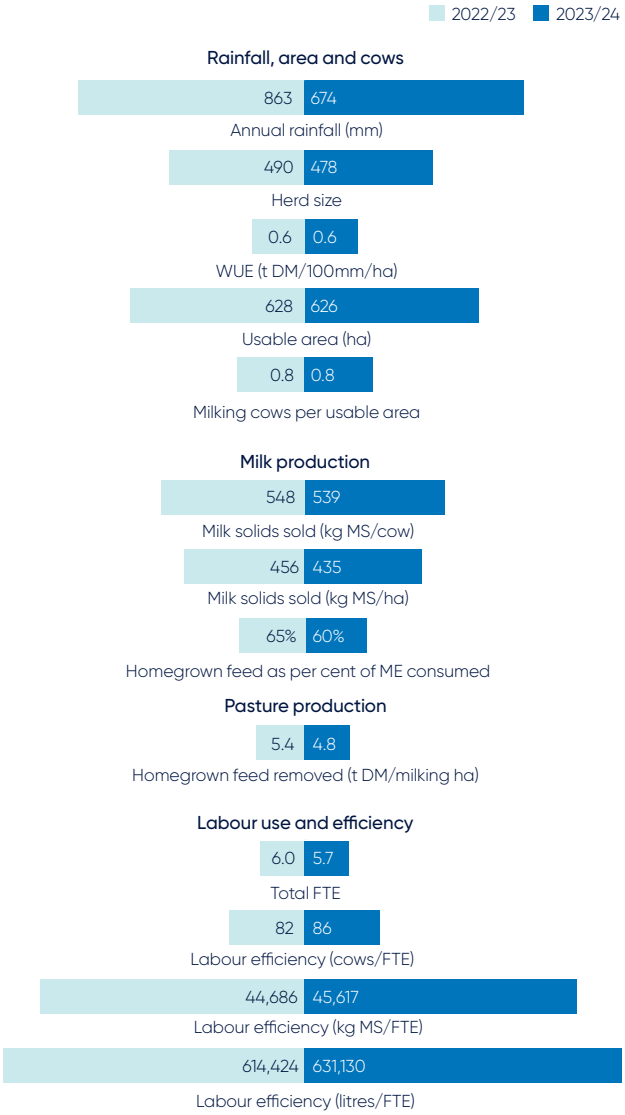
In 2023/24 the highest milk price was recorded in the 11 years of DFMP at $9.54 kg/MS or 69c/L.

On average, farm profitability decreased by 63 per cent in 2023/24 from the previous year. Earnings before Interest and Tax (EBIT) was positive for 69 per cent of participating farms.

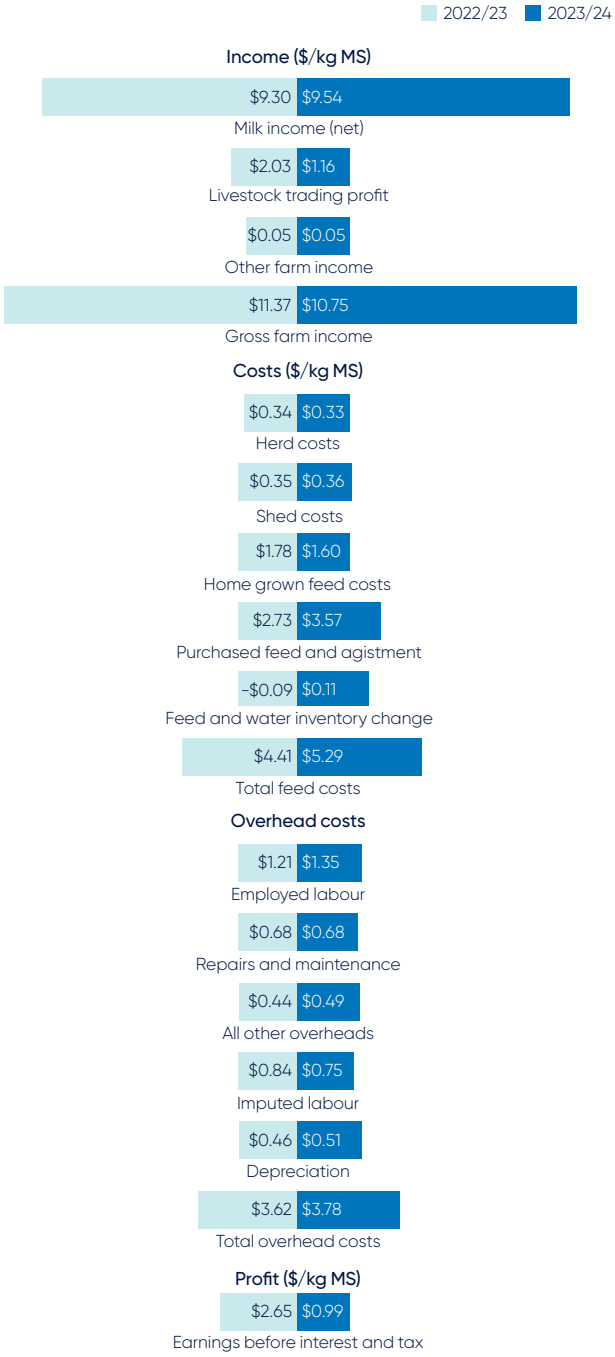
Livestock trading profit declined 43 per cent due to reduced prices and lower numbers sold.

Variable costs increased by 17 per cent (primarily due to feed costs), with overhead costs also higher by 4 per cent.

Physical parameters



Financial parameters



Gross farm income

A 5 per cent reduction in gross farm income to $10.75/kg MS or 77.7c/L was recorded in 2023/24. When accounting for inflation, it is the 3rd highest over the 11 years of the DFMP. The key driver was an increased milk price.

Variable costs

Variable costs increased 17 per cent or $0.88/kg MS (6.2c/L) with higher purchased feed costs being the largest component.

Fodder purchases increased by $0.35/kg MS (2.6c/L) largely on the back of higher hay prices and grain/concentrates increased by $0.50/kg MS (3.5c/L). Fuel and oil remained the same as last year.

The lower than average rainfall and lower feed reserves from last year resulted in a reduction in feed on hand by year end. Participants applied less fertiliser due to low growing season rainfall.

Whilst shed costs increased this year this was offset by a similar decrease in herd costs.

Overhead costs

Total overhead costs increased on average by 4 per cent in 2023/24.

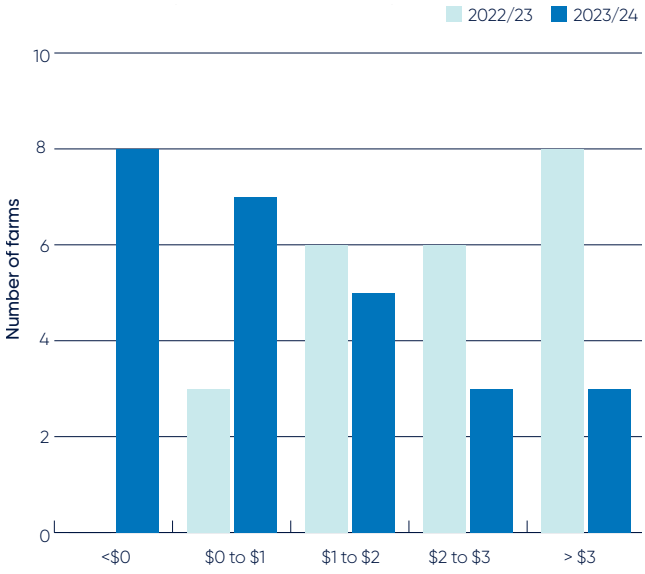
Repairs and maintenance remained stable at 0.68/kg MS (4.9 c/L) and increased depreciation costs accounted for $0.51/kg MS (4.0 c/L).

Spending on employed labour increased 12 per cent or $0.14/kg MS (1.0c/L). Availability of labour and accommodation were frequently raised by farmers as a prominent issue.

Earnings before interest and tax

In 2023/24, 69 per cent of participants had a positive EBIT (Figure 6). Average EBIT per farm (total dollars) was the lowest in the 11 years of the DFMP, accounting for inflation. Average EBIT ($0.99/kg MS) was 63 per cent lower in comparison to 2022/23 predominantly influenced by higher quantities of fodder purchased at higher prices.

Figure 6 Average EBIT per kg MS



Return on total assets and equity

Returns were the lowest in the 11-years of the project and the first year in the project's history that return on equity was negative.

A positive return on total assets (ROTA) was recorded for 69 per cent of participants (Figure 7). In 2023/24 average ROTA decreased to 2.0 per cent compared to 5.6 per cent the previous year. The lower returns were a result of lower total EBIT across participant farms.

Average return on equity (ROE) in 2023/24 was negative 0.8 per cent in comparison to the previous year at 7.7 per cent. Equity levels decreased on 58 per cent of farms during the last 12 months due to negative EBIT.

The cost of financing was higher than the returns from accessing the additional assets and only one participant recorded a higher ROE than ROTA meaning they were the only participant to grow their business in 2023/24.

Figure 7 Average returns ROTA and ROE

Business confidence

Participant farmers were more confident in their outlook for farm business returns in the coming 12 months (2024/25) than they were last year.

All participants expected milk price to either increase (4 per cent) or remain stable (96 per cent), and 50 per cent of farms are expecting milk production to increase.

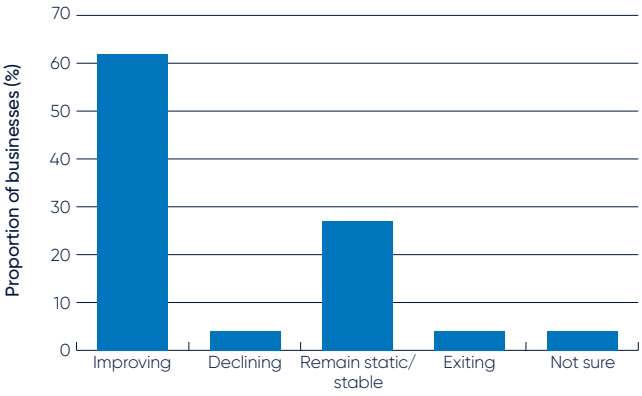
Milk price remains the major issue listed for the coming 12 months and 5 years, followed by input costs.

In 2024/25, the majority of farms were expecting costs to remain stable across all categories except labour which is expected to increase and purchased feed which is expected to decrease.

Expectations for business profit 2024/25

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 more positive than last year with 62 per cent of farms expecting an increase in returns and 27 per cent expecting returns to remain stable. Only 1 farm is expecting returns to decrease (Figure 8) and 1 farm expecting to exit the industry and unsure.

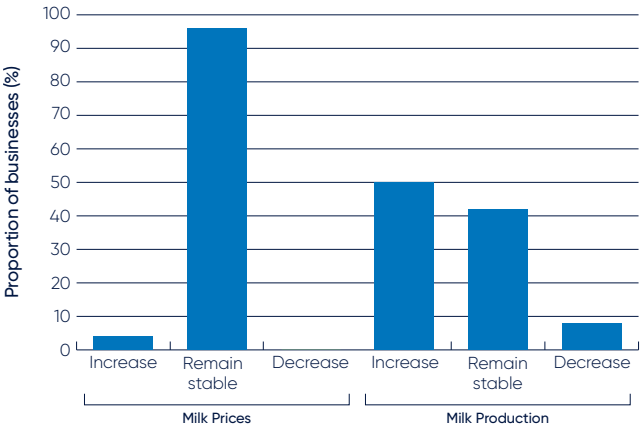
Figure 8 Expected change to farm business profit in 2024/25



Price and production expectations – milk

Participants were neutral in their outlook for milk price, but positive in their milk production outlook for 2024/25. Only 4 per cent of respondents were expecting milk price to increase with the remaining 96 per cent expecting it to remain stable. Around 50 per cent were expecting milk production to increase while 42 per cent expected it to remain stable in the coming year. Only 8 per cent predicted milk production would decrease in 2024/25 which is less than last year (Figure 9).

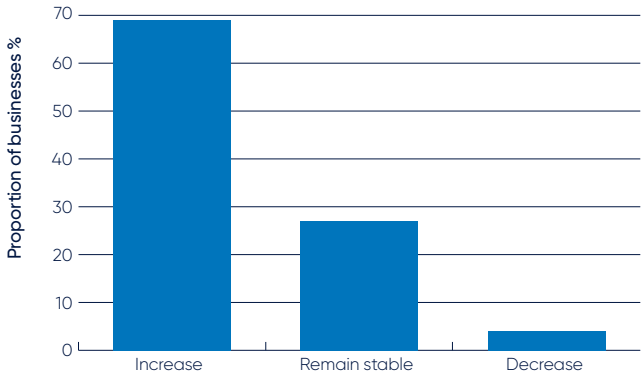
Figure 9 Producer expectations of milk prices and production in 2024/25



Production expectations – fodder

Fodder production in 2024/25 is expected to increase for 69 per cent of participant farms with a further 27 per cent expecting stable fodder production. Only 4 per cent of farms are expecting a decrease in fodder production due to consecutive years of below average rainfall (Figure 10).

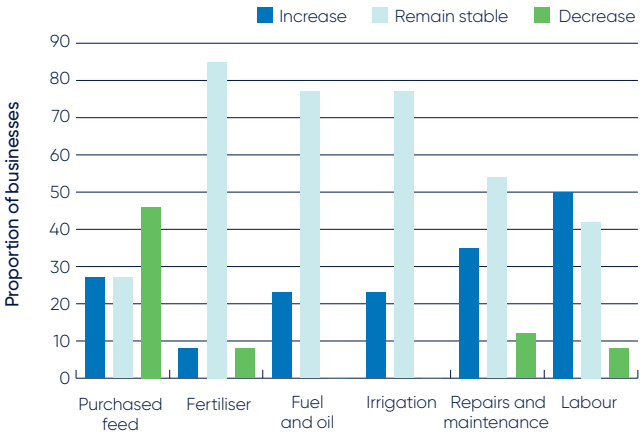
Figure 10 Producer expectations of fodder production in 2024/25



Cost expectations

In 2024/25, the majority of participants are expecting fertiliser, fuel and oil, irrigation and repairs and maintenance to remain stable (Figure 11). All participants expect fuel and oil costs to increase or remain stable. No participants are expecting a decrease in irrigation costs. 46 per cent of participants are expecting purchased feed costs to decrease.

Figure 11 Producer expectations of costs for the dairy industry in 2024/25



Comments from participants

Respondents are hoping for at least an average rainfall during the growing season, or some will face possible herd reduction decisions due to high hay prices.

Respondents also indicated they are feeling the effects of high finance costs and the increased reliance on finance in the last 12 months.

Others noted that lack of available land for both purchase and lease and the cost per hectare is restricting growth and reducing production. Aging infrastructure and high finance costs are also a concern. This is also impacting succession.

Another key concern was around continued lack of available employees. A shortage of available accommodation was again noted as being a barrier for attracting full time staff.

Some farmers are looking to exit the industry in the next 12 months.

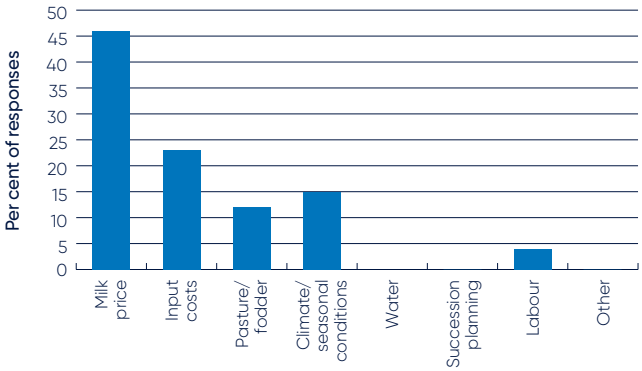
Issues of importance to dairy businesses

Participants were asked to rank issues based on the level of importance to their business – with a ranking of (1) being most important and (8) 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 milk price with 46 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. Input costs (ranked number 2 by 23 per cent of respondents) was then ahead of climate/seasonal conditions (15 per cent) and pasture/fodder (12 per cent) as being a major issue.

Figure 12 Major issues for individual businesses – 12 month outlook

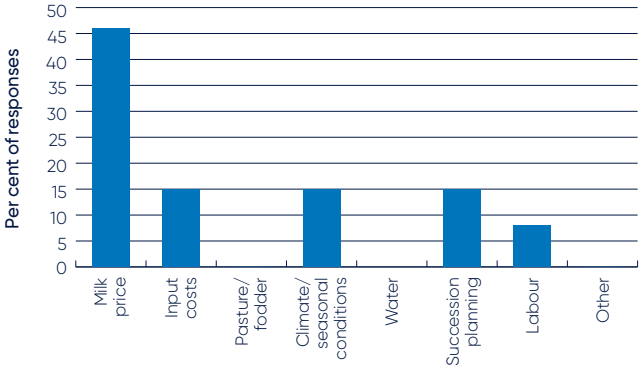


Medium to long term issues – Next five years

Milk price remains the major consideration for 46 per cent of participants farms which is higher than the 26 per cent in 2022/23, followed by input costs, climate/seasonal conditions and succession planning (15 per cent respectively) as key considerations over the coming five years.

Only 8 per cent indicated labour as a major concern.

Figure 13 Major issues for individual businesses – 5 year outlook



2023/24 Greenhouse gas emissions

The average carbon footprint for Western Australian dairy farm monitor farms was 4,593 tonnes of carbon dioxide equivalents (t CO_2-e) per farm in 2023/24.

Methane from cow rumination (enteric) accounted for 67 per cent of on-farm emissions (median).

Emissions intensity was 0.94 t CO_2-e/FPCM (Milk) which was slightly lower to the previous year.

Total emissions

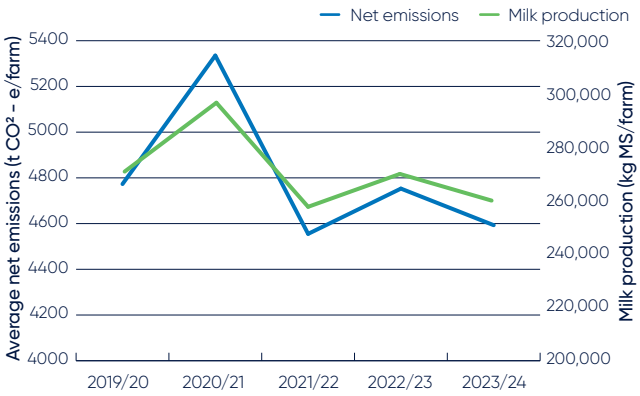
In 2023/24, the average carbon footprint (net GHG emissions) for WA participants was estimated to be 4,593t CO_2-e/farm (Figure 14). Prior to 2020/21 average farm GHG emissions had been trending upwards, mostly due to larger herd sizes and greater milk production per farm. Since 2020/21 there was a change in data capture including carbon sequestration in trees and in 2022/23 user defined inputs for manure management were captured rather than utilising state defaults, accounting for some of the variation in total farm emissions.

In 2023/24, there was a decrease in farm emissions largely due to lower milk production from a smaller average herd. There was a decrease 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), carbon dioxide emissions from fossil fuel consumption (electricity, petrochemicals and/or fuel from contractors).

The increased use of purchased fodder, grain and concentrates and the separation of the Urea component of fertiliser blends was offset by smaller herd size and smaller amount of homegrown feed produced contributing to an decrease in farm emissions. The change in data capture in 2022/23 to include an estimate for the fuel used by contractors on farm for activities such as fodder conservation and sowing has also contributed to the increase from 2021/22 to 2022/23.

Enteric methane decreased on the previous year accounting for approximately 67 per cent of emissions and is sensitive to changes in livestock weights and numbers on individual farms.

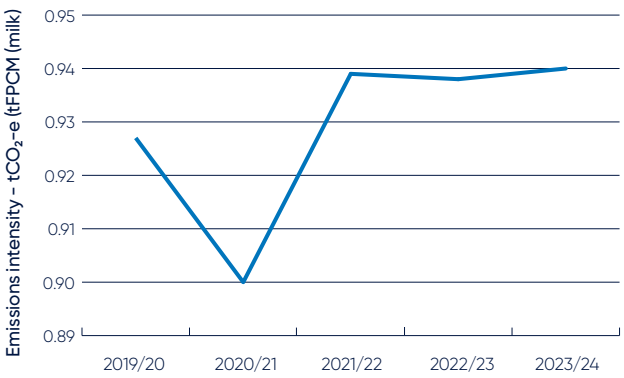
Figure 14 Estimated average net farm GHG emissions and milk solid production between 2019/20 and 2023/24 (CO_2 equivalent)



Emissions intensity

The emissions intensity allocated to milk production (once meat production is considered), increased to 0.94 t CO_2-e/t FPCM from 0.93 in 2022/23 (Figure 15 and Table 1). Emissions intensity is calculated by dividing total emissions by the amount of fat and protein corrected milk (FPCM); standard of 4.0% fat and 3.3% protein. Regional and farm variation was also observed over this period.

Figure 15 Estimated median emissions intensity between 2019/20 and 2023/24 (CO_2 equivalent)



The data

This year, several changes to the national inventory have been accounted for in the greenhouse analysis. In addition, a more accurate allocation of purchased feed emissions to milk versus meat has been made based on where the supplement is fed (i.e. milking area vs support area). It is important to note that the calculations with this year's data also re-estimates the historical data with the updated methodology.

Since 2020/21 there was a change in data capture including carbon sequestration in trees and in 2022/23 user defined inputs for manure management were captured rather than utilising state defaults, accounting for some of the variation in total farm emissions. An enhanced effort on improving the data collection process for estimating GHG emissions is likely to have also contributed to the higher emissions.

Note

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

Table 1 Estimated average GHG emissions and intensity between 2019/20 and 2023/24 (CO_2 equivalent)

Emission source	Units	2019/20	2020/21	2021/22	2022/23	2023/24
Sample size		25	21	26	23	26
Methane	t CO^2-e/farm	3,204	3,653	3,129	3,349	3,205
Pre-farm	t CO^2-e/farm	599	635	540	558	562
Nitrous oxide	t CO^2-e/farm	624	736	604	612	577
Carbon dioxide	t CO^2-e/farm	346	312	283	347	353
Tree carbon	t CO^2-e/farm	0	0	-1	-113	-105
Net GHG emissions	t CO^2-e/farm	4,773	5,335	4,555	4,753	4,593
Emissions intensity	t CO^2-e/FPCM (milk)	0.93	0.91	0.93	0.93	0.94
Emissions intensity	t CO^2-e/t MS (milk)	13.2	12.8	13.1	13.1	13.3
Emissions intensity	t CO^2-e/kg lwt (meat)	4.5	4.3	5.1	6.2	7.2

How does 2023/24 compare?

An increase in milk prices in 2023/24 was not sufficient to offset higher costs and a lower livestock profit.

In 2023/24 the average Western Australian Dairy Farm Monitor profitability was the lowest in the 11-years of the project (accounting for inflation) with 69 per cent of participants recording a profit.

Poor profit results per farm (average $349,683) across the state, was below the 11-year long term average of $628,087 (accounting for inflation).

Farm profit (EBIT) in 2023/24 was the lowest (accounting for inflation) since the start of the DFMP in 2013/14 (Figure 16). Average EBIT was $349,683 in 2023/24, compared to the long-term average of $628,087. Average net farm income was $90,312 in 2023/24, compared to the long-term average of $418,069.

Average ROTA was 2.0 per cent in 2023/24, decreasing from 5.6 per cent the previous year (Figure 17), which is the lowest in the last 11 years. The average ROE decreased to negative 0.8 per cent in 2023/24 down from 7.7 per cent in 2022/23. This is compared to the long-term average of 7.6 per cent.

A lower livestock profit and increased costs across the state in most areas of the business reduced the benefit of an increased milk price for the season.

A 36 per cent increase in finance and lease costs was driven by an increase in long term liabilities. This reduced net farm income to negative $0.12 /kg MS compared to $1.84/kg MS in 2022/23.

Figure 16 Farm profitability between 2013/14 and 2023/24

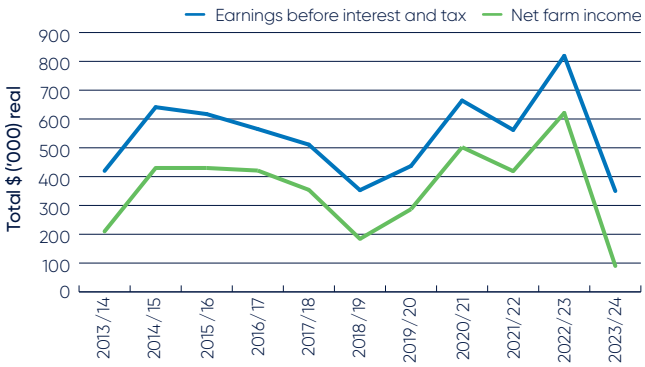
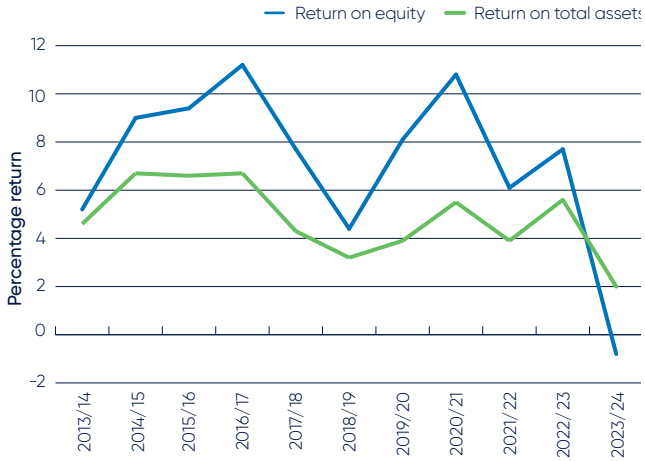


Figure 17 Whole farm performance between 2013/14 and 2023/24



Appendices

Table A6 Capital structure

Farm assets				
	Land value	Land value	Permanent water value	Permanent water value
	$/ha	$/cow	$/ha	$/cow
Average	13,629	17,541	406	461
Top 25%	11,655	14,855	469	520

Other farm assets (per usable hectare)				
Plant and equipment	Livestock	Hay and grain	Other assets	Total assets
$/ha	$/ha	$/ha	$/ha	$/ha
1,460	2,996	104	258	18,853
1,069	3,129	207	264	16,793

Liabilities		
Liabilities per usable hectare	Liabilities per milking cow	Liabilities per kgMS
$/ha	$/cow	$/kgMS
5,070	6,567	12.64
4,944	6,063	10.73

Equity	
Equity per usable hectare	Average equity
$/ha	%
13,782	70
11,849	72

Table A7 Historical data – average farm income, costs and profit per kg of milk solids

	Income				Variable costs							
	Milk income net		Gross farm income		Herd costs		Shed costs		Feed costs		Total variable costs	
Year	Nominal $/kgMS	Real $/kgMS	Nominal $/kgMS	Real $/kgMS	Nominal $/kgMS	Real $/kgMS	Nominal $/kgMS	Real $/kgMS	Nominal $/kgMS	Real $/kgMS	Nominal $/kgMS	Real $/kgMS
2013/14	6.62	8.50	7.75	9.95	0.24	0.31	0.26	0.33	3.29	4.23	3.79	4.87
2014/15	7.07	8.87	8.26	10.37	0.25	0.31	0.26	0.33	3.31	4.15	3.82	4.79
2015/16	7.22	8.94	8.29	10.27	0.26	0.32	0.24	0.30	3.45	4.27	3.95	4.89
2016/17	7.05	8.57	8.12	9.87	0.26	0.31	0.26	0.32	3.24	3.94	3.76	4.57
2017/18	7.00	8.35	8.16	9.74	0.26	0.31	0.27	0.32	3.52	4.20	4.05	4.83
2018/19	7.07	8.32	8.25	9.71	0.28	0.33	0.27	0.32	3.85	4.53	4.40	5.19
2019/20	7.35	8.54	8.74	10.16	0.27	0.32	0.28	0.32	3.86	4.49	4.41	5.13
2020/21	7.30	8.36	9.17	10.50	0.29	0.33	0.25	0.29	3.38	3.87	3.93	4.50
2021/22	7.72	8.47	10.02	10.99	0.33	0.36	0.31	0.34	4.14	4.54	4.79	5.26
2022/23	9.30	9.68	11.37	11.84	0.34	0.35	0.35	0.36	4.41	4.59	5.10	5.31
2023/24	9.54	9.54	10.75	10.75	0.33	0.33	0.36	0.36	5.29	5.29	5.98	5.98
Average		**8.74**		**10.38**		**0.33**		**0.33**		**4.37**		**5.03**

Table A7 Historical data – average farm income, costs and profit per kg of milk solids (continued)

	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 $/kgMS	Real $/kgMS	Nominal $/kgMS	Real $/kgMS	Nominal $/kgMS	Real $/kgMS	Nominal $/kgMS	Real $/kgMS	Nominal $/kgMS	Real $/kgMS	Nominal $/kgMS	Real $/kgMS	RoTA %	RoE %
2013/14	1.50	1.92	0.86	1.10	2.36	3.03	1.59	2.04	0.65	0.83	1.01	1.30	4.2	4.2
2014/15	1.47	1.84	0.8	1.00	2.26	2.84	2.17	2.72	0.59	0.74	1.66	2.08	6.3	8.2
2015/16	1.51	1.87	0.82	1.02	2.33	2.89	2.02	2.50	0.53	0.66	1.54	1.91	6.4	9.1
2016/17	1.56	1.90	0.83	1.01	2.39	2.91	1.98	2.41	0.53	0.64	1.48	1.80	6.5	18.3
2017/18	1.53	1.82	0.52	0.62	2.57	3.07	1.54	1.84	0.53	0.63	1.01	1.21	4.3	7.7
2018/19	1.71	2.01	0.98	1.15	2.69	3.17	1.16	1.36	0.60	0.70	0.56	0.66	3.2	4.4
2019/20	1.84	2.13	1.05	1.23	2.89	3.36	1.44	1.67	0.56	0.65	0.88	1.02	3.9	8.1
2020/21	2.12	2.43	0.88	1.01	3.00	3.44	2.24	2.57	0.52	0.60	1.72	1.97	5.5	10.8
2021/22	2.16	2.37	1.23	1.35	3.39	3.72	1.84	2.02	0.54	0.59	1.30	1.43	3.9	6.1
2022/23	2.32	2.42	1.30	1.35	3.62	3.77	2.65	2.76	0.81	0.84	1.84	1.92	5.6	7.7
2023/24	2.52	2.52	1.26	1.26	3.78	3.78	0.99	0.99	1.10	1.10	-0.12	(0.12)	2.0	-0.8
Average		**2.11**		**1.10**		**3.27**		**2.08**		**0.73**		**1.38**	**4.7**	**7.6**

Note: 'Real' dollar values are the nominal values converted to 2022/23 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 A8 Historical data – average farm physical information

	Total usable area	Milking area	Total water use efficiency	Number of milking cows	Milking cows	Milk sold	Milk sold	Estimated grazed pasture*	Estimated conserved feed*	Home-grown feed	Concentrate price	
Year	ha	ha	t DM/ 100mm/ha	hd	hd/ha	kg MS/ cow	kg MS/ ha	t DM/ ha	t DM/ ha	% of ME	Nominal $/t DM	Real $/t DM
2013/14	606	280	0.4	522	0.9	505	453	3.3	1.5	62	418	537
2014/15	625	296	0.6	543	0.9	535	486	3.6	1.7	64	421	528
2015/16	575	283	0.5	545	1.0	557	541	4.1	1.7	59	445	551
2016/17	499	268	0.6	498	1.0	558	570	5.1	1.3	63	404	491
2017/18	586	277	0.5	497	0.9	580	521	4.0	1.9	59	429	512
2018/19	579	286	0.6	497	0.9	566	515	4.2	1.6	62	488	575
2019/20	582	273	0.7	481	0.9	561	507	4.2	1.6	64	507	589
2020/21	678	312	0.6	524	0.8	569	471	4.6	1.9	69	494	566
2021/22	603	284	0.6	471	0.8	557	464	3.9	1.6	67	513	563
2022/23	628	296	0.6	490	0.8	548	456	3.6	1.8	65	532	554
2023/24	626	288	0.6	478	0.8	539	435	3.1	1.7	60	572	572
Average	**599**	**286**	**0.6**	**504**	**0.9**	**552**	**493**	**4.0**	**1.7**	**46**		**549**

* 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.
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.
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.
Appreciation	An increase in the value of an asset in the market, often only applicable to land value.
Asset	Anything managed by the farm, whether it is owned or not. Assets include owned land and buildings, leased land, plant and machinery, fixtures and fittings, trading stock, farm investments (i.e., Farm Management Deposits), debtors, and cash.
Cash overheads	All fixed costs that have a cash cost to the business. Includes all overhead costs except imputed labour costs and depreciation.
Cost structure	Variable costs as a percentage of total costs, where total costs equal variable costs plus overhead costs.
Concentrates	Refers to feeds with a concentrated source of energy such as grains, pellets and other grain mixes.
Debt servicing ratio	interest and lease costs as a percentage of gross farm income.
Depreciation	Decrease in value over time of capital asset, usually as a result of using the asset. Depreciation is a non-cash cost of the business but reduces the book value of the asset and is therefore a cost.
Earnings before interest and tax (EBIT)	Gross income minus total variable and total overhead costs.
Employed labour cost	Cash cost of any paid employee, including on-costs such as superannuation and Workcover.
Equity	Total assets minus total liabilities. Equal to the total value of capital invested in the farm business by the owner/operator(s).
Equity 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.
Feeding systems	**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. **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. **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. **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. **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.
Finance costs	See interest and lease costs.
Full time equivalent (FTE)	Standardised labour unit. Equal to 2,400 hours a year. Calculated as 48 hours a week for 50 weeks a year.
Grazed pasture	Calculated using the back-calculation approach. Grazed pasture is calculated as the difference 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, walking distance to shed, terrain and number of animals. 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)).
Gross farm income	Farm income including milk sales, livestock trading and other income such as income from grants and rebates.
Gross margin	Gross farm income minus total variable costs.
Herd costs	Cost of artificial insemination (AI) and herd tests, animal health and calf rearing.
Imputed	An estimated amount introduced into economic management analysis to allow reasonable comparisons between years and between other businesses.
Imputed labour cost	An allocated allowance for the cost of owner/operator, family, and sharefarmer time in the business.

Interest and lease costs	Total interest plus total lease costs paid.
Labour cost	Cost of the labour resource on farm. Includes both imputed and employed labour costs.
Labour efficiency	FTEs per cow and per kg MS. Measures productivity of the total labour resources in the business.
Liability	oney 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.
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.

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. 1mm is equivalent to 4 points or 1/25th of an inch of rainfall
MS	Milk solids (protein and fat)
N_2O	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 = 1,000kg

Standard values

Pasture consumption

The pasture consumption calculation assumes 11 ME for homegrown feed.

Livestock values

The standard vales 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
23/24 calves		$825
Mature bulls	$3,300	$3,300

Imputed owner/operator and family labour

In 2023/24, the imputed owner/operator and family labour rate was $36/hr based on a full time equivalent (FTE) working 48 hours/week for 50 weeks of the year.

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5714 | Jan 2025