

DairyNZ 

Economic Survey

2022-23



Contents

Introduction	1
Executive Summary	2
Owner-operator Summary	2
50:50 Sharemilkers Summary.....	4
1. Background	6
2. Survey Description	7
2.1. Survey Methodology.....	7
2.2. Ownership Structure Definitions.....	7
2.3. Sample Unit.....	7
2.4. Survey Weights.....	7
2.5. Herd Size Distributions.....	8
2.6. Survey Regions	10
2.7. Production Systems.....	11
2.8. Operating Profit Adjustments.....	11
2.9. Asset Values.....	12
2.10. GST.....	12
2.11. Statistical Methodology.....	12
3. Physical Analysis	14
3.1. Introduction	14
3.2. Rainfall Summary.....	14
3.3. Feed Use.....	15
3.4. Partial Productivity.....	16
3.5. Profit from Productivity.....	17
4. Prices Received and Paid	19
4.1. Milk Payment.....	19
4.2. Livestock Prices	20
4.3. Feed and Fertiliser Prices.....	21
4.4. On-farm Inflation.....	22
5. Owner-Operator: Operational Financial Analysis	24
5.1. Introduction	24
5.2. Revenue.....	24
5.3. Expenditure.....	26
5.4. Profitability.....	27
5.5. Cash Flow.....	33

5.6. Operating Profit Margin.....	34
6. Owner-Operator: Equity and Capital Financial Analysis	35
6.1. Introduction.....	35
6.2. Dairy Assets.....	35
6.3. Liabilities and Debt Servicing.....	36
6.4. Liquidity.....	37
6.5. Returns	38
7. Owner-Operator: Regional and Systems Financial Analysis.....	39
7.1. Regional Profitability	39
7.2. Production Systems.....	42
8. 50:50 Sharemilkers: Operational Financial Analysis.....	45
8.1. Introduction	45
8.2. Revenue.....	45
8.3. Expenditure.....	47
8.4. Profitability.....	48
8.5. Cash Flow.....	51
8.6. Operating Profit Margin.....	52
9. 50:50 Sharemilkers: Equity and Capital Financial Analysis.....	53
9.1. Introduction	53
9.2. Dairy Assets.....	53
9.3. Liabilities and Debt Servicing.....	53
9.4. Returns	55
10. 50:50 Sharemilkers: Regional Financial Analysis.....	57
10.1. Regional Profitability	57
11. Dairy Tomorrow Measures.....	60
11.1. Annual Update	60
12. Time Series Tables: Owner-Operator.....	62
13. Time Series Tables: 50:50 Sharemilkers.....	69

Introduction

The 2022-23 DairyNZ Economic Survey is the eighteenth annual survey of New Zealand dairy farmers using dairy farm business data from DairyBase®.

The Economic Survey of Factory Supply Dairy Farmers was first published in 1963-64 by the New Zealand Dairy Board. In 1988-89 the survey was undertaken by Livestock Improvement Corporation (LIC) and then Dexcel in 1999-2000, when the name was changed to Economic Survey of New Zealand Dairy Farmers. From 2005-06 DairyNZ published the survey under the new title DairyNZ Economic Survey.

DairyNZ is an industry good organisation, representing New Zealand's dairy farmers. Funded by a levy on milksolids and together with government investment, our purpose is to progress a positive future for New Zealand dairy farming and help dairy farmers successfully navigate through change. We aim to do this by leading innovation in world-class dairy farming and by working always in the best interests of New Zealand's dairy farmers. DairyBase® is owned and managed by DairyNZ on behalf of the dairy farmers of New Zealand.

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This publication is a reference compilation of dairy farmers' key financial data. DairyNZ has endeavoured to ensure that the information in this publication is accurate but does not accept liability for any error or omission. No persons involved in data collection, processing, analysis or editing will be held accountable. Data in this document can be used for other purposes provided it is correctly referenced. The correct reference for all data contained in this document is: DairyNZ Economic Survey 2022-23.

The DairyNZ Economic Survey is available as a PDF version on the DairyNZ website and as an interactive online publication allowing direct download of summary data as CSV files.



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Executive Summary

Compared to the previous season (2021-22), milksolids payout received by owner-operator farmers in the DairyNZ Economic Survey sample in 2022-23 decreased by \$0.51 to \$8.68 per kilogram of milksolids (kg MS), milksolids sold per cow increased by 5 kg MS to 418 kg MS, and stocking rate decreased by 0.1 cows to 2.8 cows/ha. As a result, milksolids sold per hectare decreased slightly in the 2022-23 season, from 1,199 kg MS/ha in 2020-21 to 1,174 kg MS/ha. Operating expenses per kilogram of milksolids increased by \$0.32 to \$6.67. The combination of a lower milksolids payout and higher operating expenses in 2022-23 resulted in an Operating profit per hectare of \$3,017, \$1,133 lower than the previous season. Operating return on dairy assets decreased from 7.6 percent (2021-22) to 5.4 percent (2022-23), and total return on assets decreased by 3.6 percentage points to 3.9 percent. The mix of lower returns from dairy operations and higher interest costs resulted in a lower Total return on equity in 2022-23 (3.5 percent) compared to the previous season (11.5 percent).

Owner-operator Summary

In the 2022-23 season owner-operators faced a decrease in milksolids payout, which together with a reduction in stocking rate and an increase in farm expenses led to a notable decline in operating profit compared to the previous season.

The milksolids payout received by owner-operators in 2022-23 was \$0.51 (6%) lower than the price received in 2021-22. Although milksolids sold per cow increased by 1 percent, milksolids sold per hectare decreased by 2 percent in the 2022-23 season due to a 3.4 percent reduction in stocking rate. The reduction in stocking rate in 2022-23 was in part associated with a reduction in the average herd size, from 419 to 407 cows. The reduction in herd size also contributed to the reduction in livestock income per kilogram of milksolids in 2022-23, from \$0.55 (2021-22) to \$0.51. Gross farm revenue per kilogram of milksolids in 2022-23 (\$9.24/kg MS) was \$0.57 lower than in the previous season, a consequence of lower income from the sale of milksolids and livestock. Farm working expenses and Operating expenses in 2022-23 (\$5.75/kg MS and \$6.67/kg MS, respectively) were the highest of the last 10 seasons, driven mainly by increases in feed, grazing off, labour and fertilisers expenses (Table 12.4). The Operating profit of \$3,017 per hectare in 2022-23 was down 27 percent on the previous season, a consequence of lower Gross farm revenue (-8 percent) and higher Operating expenses (+3 percent).

The cash surplus in 2022-23 (\$44,541) was above the 10-year average of (\$10,654). Cash surplus is the cash remaining from the farming operation during the year after rent, interest, tax, capital transactions, debt repayments, drawings, and discretionary expenses have been deducted. Factors that contributed to the high Cash surplus in 2022-23 were the increases in net off-farm income (\$36,366) and the significant reductions in net capital transactions (\$137,369) and net debt (\$38,791), compared to the previous year (Table 12.5).

In 2022-23, the total return on assets (3.9 percent) and the total return on equity (3.5 percent) were significantly lower than in the previous year but higher than their corresponding 10-year average (3.3 and 2.5 percent, respectively). In 2022-23, total liabilities decreased by \$46,773 to \$4,027,540. Closing term liabilities were \$22.22 per kilogram of milksolids, significantly lower than the peak of \$25.31 per kilogram of milksolids in 2017-18. On average, total equity growth was \$95,121, \$34,231 lower than the growth in equity from profit (\$129,388) due to negative growth in equity from capital (revaluation of assets).

Owner-operator Summary Table

Variable	2021-22	2022-23
PHYSICAL CHARACTERISTICS		
Effective hectares	144	145
Peak cows milked	419	407
Stocking rate (cows/ha)	2.9	2.8
Kg milksolids sold	172,832	169,990
Milksolids sold per hectare	1,199	1,174
Milksolids sold per cow	413	418
PRICES:		
PAYOUT RECEIVED (\$/kg MS sold)	9.19	8.68
CASHFLOW:		
Cash operating surplus	771,689	593,495
Discretionary cash	489,778	302,861
Cash available for living and growth	427,950	301,982
Cash surplus/deficit	2,543	44,541
PROFITABILITY PER HA:		
Dairy gross farm revenue per ha	11,761	10,851
Dairy operating expenses per ha	7,611	7,834
Dairy operating profit per ha	4,150	3,017
Business profit before tax per all effective hectares	2,868	1,834
PROFITABILITY PER KG MILKSOLIDS:		
Dairy gross farm revenue per kg milksolids	9.81	9.24
Farm working expenses per kg milksolids	5.32	5.75
Dairy operating expenses per kg milksolids	6.35	6.67
Dairy operating profit per kg milksolids	3.46	2.57
RETURNS:		
Operating return on dairy assets %	7.6	5.4
Total return on assets %	7.5	3.9
Total return on equity %	11.5	3.5
WEALTH CREATION:		
Growth in equity	362,987	95,121
Growth in equity from profit	297,876	129,388
Growth in equity from capital	65,148	-34,231
Growth in equity %	8.3	1.9
RISK:		
Closing debt to asset %	47.4	44.4
Closing term liabilities per kg MS	23.56	22.22

50:50 Sharemilkers Summary

In this iteration of the DairyNZ Economic Survey, the physical characteristics of 50:50 Sharemilker (herd-owning sharemilkers) farms all increased, in terms of hectares, peak cows milked and milksolids production.

The combination of a lower gross farm revenue and higher farm working expenses contributed to tightened economic performance of 50:50 sharemilker farms relative to the previous season. However, despite the deteriorated performance, on average, 50:50 sharemilkers maintained positive profitability and returns. Additionally, the proportion of 50:50 sharemilkers experiencing extreme indebtedness (>70% debt to assets ratio) in 2022-23 (1.8 percent) decreased significantly relative to 2021-22 (4.6 percent).

Dairy operating profit per hectare for 50:50 sharemilkers decreased by 37 percent to \$1,104 per hectare in 2022-23. Lower milk payouts received (-\$0.40 per kilogram of milksolids) were partially offset by an increase in milksolids per cow (+10 kg MS) and a slight increase in herd size (+15 cows). Gross farm revenue of \$4.65 per kilogram of milksolids was down \$0.40 in 2022-23. Farm working expenses of \$3.05 per kilogram of milksolids were \$0.20 higher than last season. Operating expenses per kilogram of milksolids increased by \$0.15 in 2022-23 to \$3.76.

Cash surplus in 2022-23 (\$5,853) was significantly lower than in 2020-21 and 2021-22 (\$51,154 and \$38,556, respectively). However, the cash surplus in 2022-23 was still higher than the 10-year average of \$2,625. Factors that contributed to a lower cash surplus in 2022-23 were the reduction in cash operating surplus, from \$344,252 (2021-22) to \$250,934, and the higher-than-average interest expenses (\$29,384) and drawings (\$90,535). Tax expenses in 2022-23 (\$66,548) were 81 percent above the 10-year average (\$36,578), net debt (\$48,487) was 280 percent above the 10-year average (\$12,682) and drawings were 25 percent above the 10-year average of \$72,400.

50:50 Sharemilkers Summary Table

Variable	2021-22	2022-23
PHYSICAL CHARACTERISTICS		
Effective hectares	140	147
Peak cows milked	422	437
Stocking rate (cows/ha)	3.0	3.0
Kg milksolids sold	171,282	181,551
Milksolids sold per hectare	1,227	1,239
Milksolids sold per cow	406	416
PRICES:		
PAYOUT RECEIVED (\$/kg MS sold)	4.54	4.14
CASHFLOW:		
Cash operating surplus	344,252	250,934
Discretionary cash	258,608	168,587
Cash available for living and growth	249,488	181,016
Cash surplus/deficit	38,556	5,853
PROFITABILITY PER HA:		
Dairy gross farm revenue per ha	6,198	5,763
Dairy operating expenses per ha	4,434	4,659
Dairy operating profit per ha	1,764	1,104
Business profit before tax per all effective hectares	2,202	1,480
PROFITABILITY PER KG MILKSOLIDS:		
Dairy gross farm revenue per kg milksolids	5.05	4.65
Farm working expenses per kg milksolids	2.86	3.05
Dairy operating expenses per kg milksolids	3.61	3.76
Dairy operating profit per kg milksolids	1.44	0.89
RETURNS:		
Operating return on dairy assets %	26.9	15.9
Total return on assets %	23.6	6.8
Total return on equity %	42.5	9.4
WEALTH CREATION:		
Growth in equity	260,649	62,197
Growth in equity from profit	182,517	93,657
Growth in equity from capital	78,156	-31,445
Growth in equity %	36.8	7.4
RISK:		
Closing debt to asset %	36.5	36.6
Closing term liabilities per kg MS	2.67	2.29

1. Background

The 2022-23 DairyNZ Economic Survey summarises a sample of dairy farm data from the DairyBase® database. DairyBase® is available to all levy paying New Zealand dairy farmers. Annual surveys before 2005-06 were conducted by the Livestock Improvement Corporation (LIC) and Dexcel using a random sampling procedure stratified by region and herd size. In contrast, participation in DairyBase® is voluntary, and on average, it includes farms that have higher-than-average milk production levels. For this publication, groups of farms were selected to match the average regional herd size, hectares and milksolids production as published in the New Zealand Dairy Statistics 2022-23 as close as possible while maintaining a large sample size.

The purpose of DairyBase® is to improve the financial understanding and performance of dairy farmers using a benchmarking approach and is designed to link the physical and financial performance of farms. DairyBase® contains financial data from annual farm accounts, physical data supplied by the farmer, and estimated current market values of fixed assets. The DairyBase® support centre, accredited accountants and other rural professionals enter the data on behalf of their clients, and it is validated within DairyBase®. Farmers wishing to benchmark their farm performance have access to a wide range of statistics in DairyBase®, including (where numbers permit) regional, district and production system data.

2. Survey Description

2.1. Survey Methodology

Groups of farms were selected to match the average regional herd size, hectares and milksolids production as published in the New Zealand Dairy Statistics 2022-23 as close as possible while maintaining a large sample size. The initial pool of farms included 811 owner-operators and 238 50:50 sharemilkers (herd-owning sharemilkers) with data validated and committed to the DairyBase® database for the 2022-23 financial year. Businesses were then excluded for the following reasons:

- multiple herds operating under one business identity.
- herds with fewer than 50 cows.
- businesses with a significant change in the land area during the year (>10%).
- extreme outlier data.
- incomplete financial data.

The sample selection process aimed to align the regional and national average herd sizes, hectares and milksolids production for each of these two ownership structures while retaining a reasonable number of farm businesses. These regional and national averages are available in the 2022-23 New Zealand Dairy Statistics publication.

The final number of herds included in this survey comprised 266 owner-operators and 109 50:50 sharemilker herds. Of the owner-operator herds, 200 (75%) were North Island herds, and 66 (25%) were from the South Island. Of the sharemilker herds, 77 (71%) were from the North Island, and 32 (29%) were South Island herds.

2.2. Ownership Structure Definitions

An owner-operator receives 100 percent of the milk revenue and either owns, or leases, both the herd and the land. In contrast, a 50:50 sharemilker owns the herd but not the milking land and receives 50 percent of the milk revenue. Although the definition of sharemilkers used in this survey is 50:50, in practice, they may receive between 40 percent and 60 percent of the milk revenue. Herds with variable order sharemilkers, and farm owners with sharemilking arrangements, were not included in this survey.

2.3. Sample Unit

The data used in this survey reflects the total dairying enterprise of each business. Where businesses have multiple ownership types, such as partnerships and trusts, the accounts of all entities are consolidated and entered as one.

2.4. Survey Weights

All national averages in this report have been weighted by the regional proportion of herds reported in the 2022-23 New Zealand Dairy Statistics (Table 2.1). Simply averaging the regional data shown in this document does not produce the same national average. Weighting the data ensures that each region contributes a representative

proportion to the national averages. The national averages for 50:50 sharemilkers are weighted by the regional proportion of sharemilkers.

Table 2.1: Dairy Statistics 2022/23

Region	Owner-operator herds	% of Owner-operator herds	50:50 Sharemilker herds	% of 50:50 Sharemilker herds
Northland	442	7.9	171	5.7
Waikato	1,760	31.3	1,126	37.8
Bay of Plenty	287	5.1	150	5.0
Taranaki	820	14.6	453	15.2
Lower North Island	583	10.4	197	6.6
West Coast - Top of the South	305	5.4	89	3.0
Canterbury	701	12.5	361	12.1
Otago - Southland	729	13.0	431	14.5
Total New Zealand	5,627	100	2,978	100

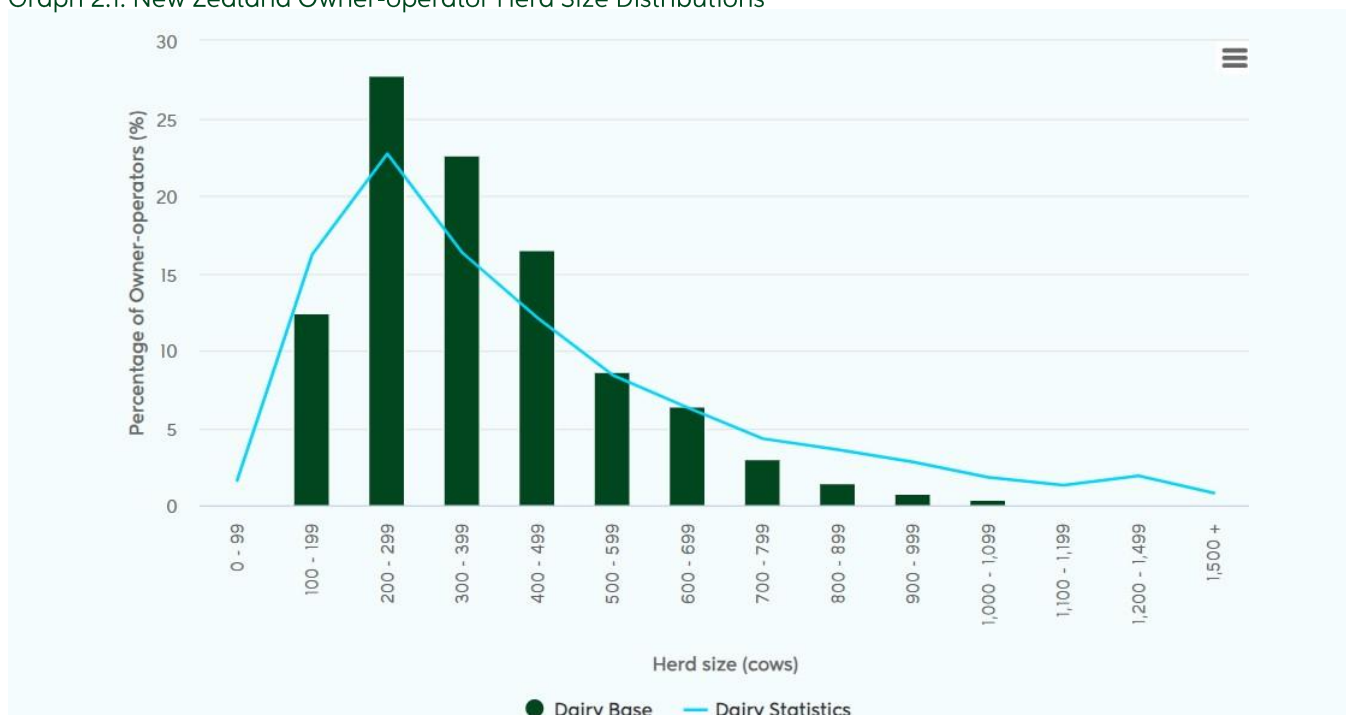
2.5. Herd Size Distributions

The average owner-operator herd in the DairyNZ Economic Survey had 407 cows, 12 cows lower than in the 2021-22 season. In comparison to the 2022-23 New Zealand Dairy Statistics national average herd size of 435, the average DairyNZ Economic Survey farm had 28 fewer cows.

Graph 2.1 shows a comparison of the owner-operator herd distribution between the 2022-23 DairyNZ Economic Survey and the 2022-23 New Zealand Dairy Statistics. In general, the DairyNZ Economic Survey:

- is over-represented by herds between 200 and 500 cows.
- is under-represented by herds with less than 200 cows, and by herds with 700 cows or more.

Graph 2.1: New Zealand Owner-operator Herd Size Distributions

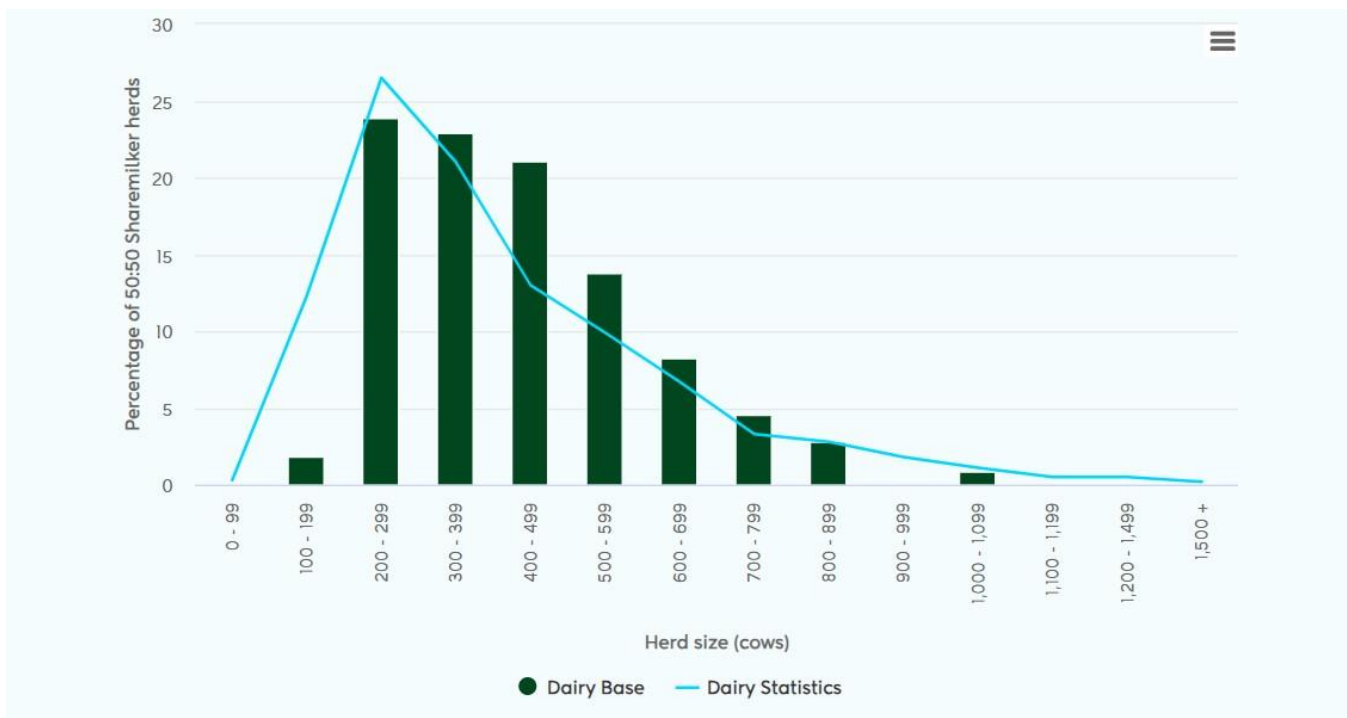


The DairyNZ Economic Survey national average herd size for 50:50 sharemilkers of 437 cows is larger than the 402 cows recorded in the 2022-23 New Zealand Dairy Statistics.

As compared with the 2022-23 New Zealand Dairy Statistics (Graph 2.2), for 50:50 sharemilkers, the DairyNZ Economic Survey:

- has no herds under 100 cows, herds between 900 and 1000 cows, and herds with more than 1,100 cows.
- is over-represented by herds between 400 and 600 cows.
- is under-represented by herds between 100 and 300 cows.

Graph 2.2: New Zealand 50:50 Sharemilker Herd Size Distributions



2.6. Survey Regions

This survey uses geographic districts as defined by the 73 Territorial Local Authorities (TLAs). These districts are amalgamated into eight regions, five in the North Island and three in the South Island. Regions 6 and 7, and the TLAs included in them were updated in the 2021-22 Dairy Economic Survey, to reflect similar changes in DairyBase®. Since 2021-22, the Marlborough and Kaikoura districts were moved from the Marlborough - Canterbury region to the West Coast - Top of the South region. For regions 6 and 7, part of the differences between values before and after the 2021-22 season (sections 7.1 and 10.1) is due to the rearrangement of the TLAs that were part of them.

1 Northland

1. Far North district
2. Whangarei district
3. Kaipara district
4. Rodney district
5. North Shore district
6. Waitakere district

2 Waikato

7. Auckland city
8. Thames/Coromandel district
9. Manukau city
10. Papakura district
11. Franklin district
12. Hauraki district
13. Waikato district
14. Matamata/Piako district
15. Hamilton city
16. Waipa district
17. South Waikato district
18. Otorohanga district
19. Waitomo district
20. Taupo district
21. Ruapehu district

3 Bay of Plenty

22. Tauranga district
23. Western Bay of Plenty district
24. Opotiki district
25. Kawerau district
26. Rotorua district
27. Gisborne district
28. Whakatane district
29. Wairoa district

4 Taranaki

30. New Plymouth district
31. Stratford district
32. South Taranaki district

5 Lower North Island

33. Hastings district
34. Napier city
35. Rangitikei district
36. Wanganui district
37. Central Hawkes Bay district
38. Manawatu district
39. Palmerston North city
40. Tararua district
41. Horowhenua district
42. Kapiti Coast district
43. Masterton district
44. Carterton district
45. Upper Hutt district
46. Porirua city
47. Wellington city
48. Lower Hutt city
49. South Wairarapa district

6 West Coast – Top of the South

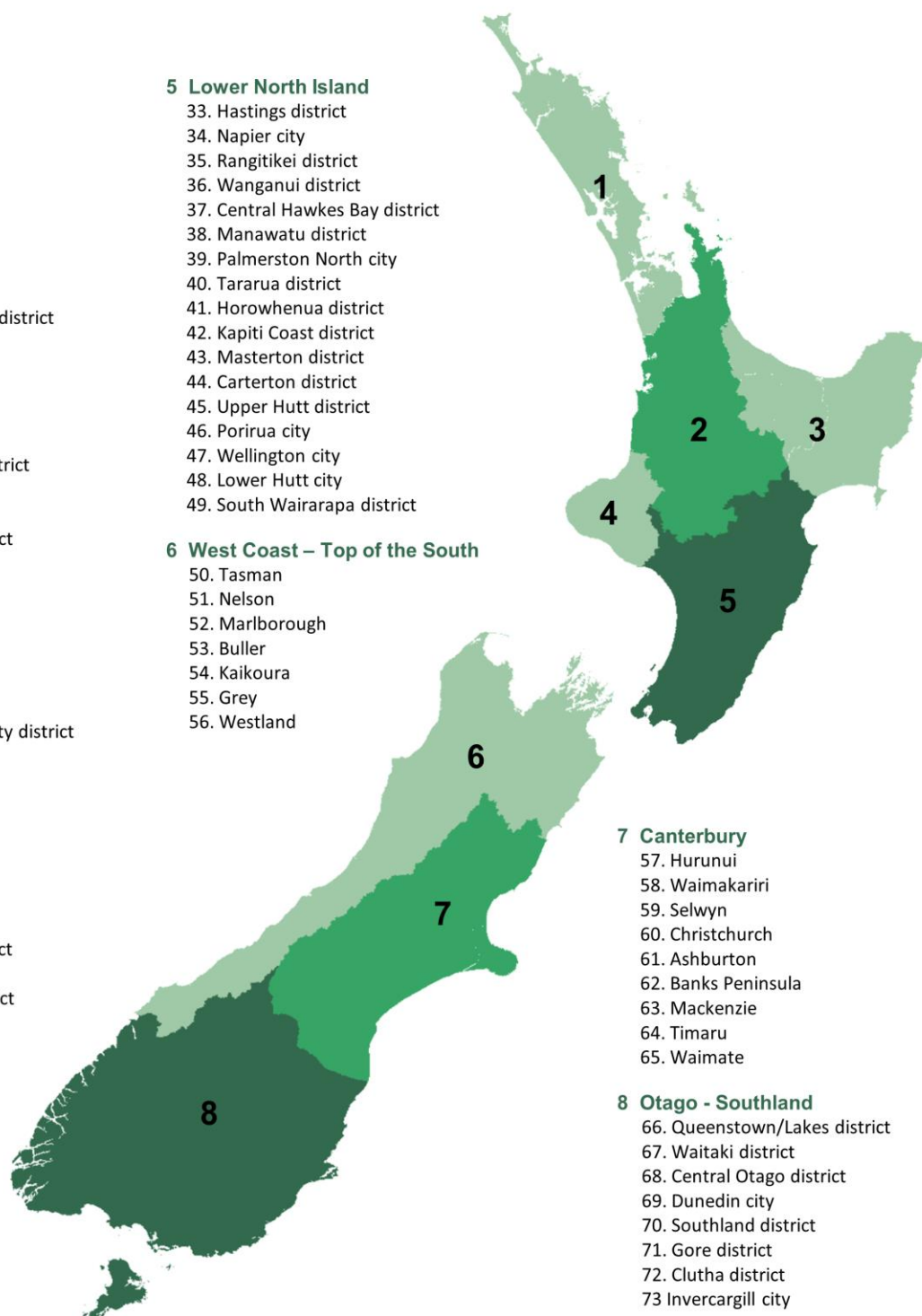
50. Tasman
51. Nelson
52. Marlborough
53. Buller
54. Kaikoura
55. Grey
56. Westland

7 Canterbury

57. Hurunui
58. Waimakariri
59. Selwyn
60. Christchurch
61. Ashburton
62. Banks Peninsula
63. Mackenzie
64. Timaru
65. Waimate

8 Otago - Southland

66. Queenstown/Lakes district
67. Waitaki district
68. Central Otago district
69. Dunedin city
70. Southland district
71. Gore district
72. Clutha district
73. Invercargill city



2.7. Production Systems

Farms are categorised into one of five production systems based on the timing, purpose and amount of imported feed used, both purchased as supplements and grazing off for dry cows. Young stock grazing policies are excluded when categorising herds into the five production systems described below.

System 1: All grass, self-contained, all adult stock on the dairy platform.

- No feed is imported. No supplement is fed unless harvested off the effective milking area, and dry cows are not grazed off the effective milking area.

System 2: Feed imported fed to dry cows (either supplement or grazing off).

- 90-99 percent of total feed is home grown feed. Variation in percentage as most cows are wintered off in high rainfall areas or cold climates.

System 3: Feed imported to extend lactation and for dry cows.

- 80-89 percent of total feed is home grown feed.

System 4: Feed imported and used at both ends of lactation and for dry cows.

- 70-79 percent of total feed is home grown feed.

System 5: Imported feed used all year.

- 50-69 percent of total feed is home grown feed, though it could be less than 50 percent in some cases.

This publication refers to low, medium and high input systems. These are defined as:

- **Low:** system 1 and system 2.
- **Medium:** system 3.
- **High:** system 4 and system 5.

2.8. Operating Profit Adjustments

Non-cash adjustments for resources used but not accounted for by cash income or expenditure are made when calculating the operating profit. A summary of these adjustments is shown below. For more detail, refer to the DairyBase® Operating Profit Adjustments and DairyBase® Livestock Values documents. An example of non-cash adjustments is the value of change in dairy livestock. This is the value due to a change in livestock numbers which is added or subtracted (if negative) to net dairy cash income to form gross farm revenue. This adjustment is made because the revenue from net dairy cash income can be affected by changes in herd size. For example, in drought years, more stock is sold and therefore, revenue through net livestock sales will be considerably higher. Similarly, livestock will be purchased in the years following a drought to increase numbers to a more normal level. The adjustment offsets these changes with a value for change in livestock on hand.

The operating profit adjustments include:

- **The value of change in dairy livestock.** This is calculated as follows: closing livestock numbers less opening livestock numbers, valued at closing herd scheme values (Inland Revenue).
- **Labour adjustment.** This has two components: unpaid management based on the size of the herd and time worked, and unpaid labour valued at an hourly market rate.
- **Feed inventory adjustment.** This is estimated as closing supplementary feed on hand less opening supplementary feed on hand, valued at a standard 42 cents per kilogram of dry matter in 2022-23.
- **Owned support block adjustment.** This value is based on the regional market lease rate per hectare.
- **Depreciation.** This is the depreciation recorded in the annual financial statements of the farm.

2.9. Asset Values

DairyBase® calculates market values for land and buildings by using the most recent rateable valuations for each farm and adjusting these to 1 June 2022 and 1 June 2023 market values using sales data supplied by Quotable Value and REINZ, plus discussions with regional real estate agents and valuers. Opening and closing livestock values for each year are calculated using the Inland Revenue herd value scheme NAMV (National Average Market Values) for the appropriate age group of animals. Plant, machinery and vehicle values are recorded at book value. Off-farm assets and investments are shown as market values.

2.10. GST

The financial data is GST exclusive as these transactions are neutral to the farm operation.

2.11. Statistical Methodology

Multiple methodologies are used in the DairyNZ Economic Survey to generate statistics.

Tables and graphs that use time series data are generated using an average of sums methodology. The average of sums involves summing all values together. While per farm values will be equivalent to the arithmetic mean, values that are divided by the number of cows, hectares, and milksolids will report the average value divided by the average denominator.

The average of sums approach ensures that table entries add up to totals and sub-totals. However, a consequence of this methodology is that the averages reported are not equivalent to the arithmetic mean and can be biased depending on the data distribution. This bias can be severe in small samples, such as those used to produce the regional and production system tables. To circumvent issues of this kind, we now report the median of the data in the tables and graphs that are most at risk of showing such bias i.e. regional data. The median is the number that divides the data into two halves, such that half of the data is below, and half the data is above this value. It is a robust and unbiased representation of the centre of the data. In the affected tables, entries will no longer add up to totals and sub-totals but provide a more accurate and representative value for the data. For example, in Table 7.1, we can see that by adding milk sales (net of dairy levy), net livestock sales (sales - purchases) and other dairy cash income, they do not add up to net dairy cash income, in contrast to the equivalent table presented in the 2018-19 version of the DairyNZ Economic Survey.

The median is used in several different figures and tables:

- In Figure 3.1, we use the median deviation from the 30-year median rainfall. We do this because the arithmetic average is not robust to severe weather events that may misrepresent the true average rainfall a region receives in a season.
- In Tables 7.1, 7.2, 10.1 and 10.2, we report the median values for the table entries. Issues applying the average of sums methodology on these tables were identified in 2020. It was decided that accurate representation of these values was more important than ensuring the values added up in the table.

3. Physical Analysis

3.1. Introduction

The DairyNZ Economic Survey reports the trends in the financial performance of dairy farms but not all the trends in physical performance. While not presented, there are key physical indicators of milk production such as the days in milk, cow condition, reproductive performance, soil fertility, and fertiliser use data available in DairyBase®. It is the combination of the physical performance of the farm reflected through milksolids production, the cost of production and milk prices that drives the financial results. To find out more about the physical performance of dairy farms refer to New Zealand Dairy Statistics, available on the DairyNZ or LIC websites.

3.2. Rainfall Summary

NIWA supplies daily climate data for various points across New Zealand with their Virtual Climate Station Network. These data are collated into district-level averages for each month, weighted for areas where more farms are located. Within each region, median rainfall for the October to December (spring), January to March (summer), April to June (autumn) and July to September (winter) periods was calculated. The variation in the median regional rainfall from the thirty-year-weighted median is shown in Figure 3.1. See section 2.11 for an explanation of the median methodology used here. Overall, most regions had significantly wetter summers than the thirty-year weighted median, with only the West Coast - Top of the South and Otago - Southland regions experiencing less rain in summer than the long-term average.

Graph 3.1: Variation in rainfall

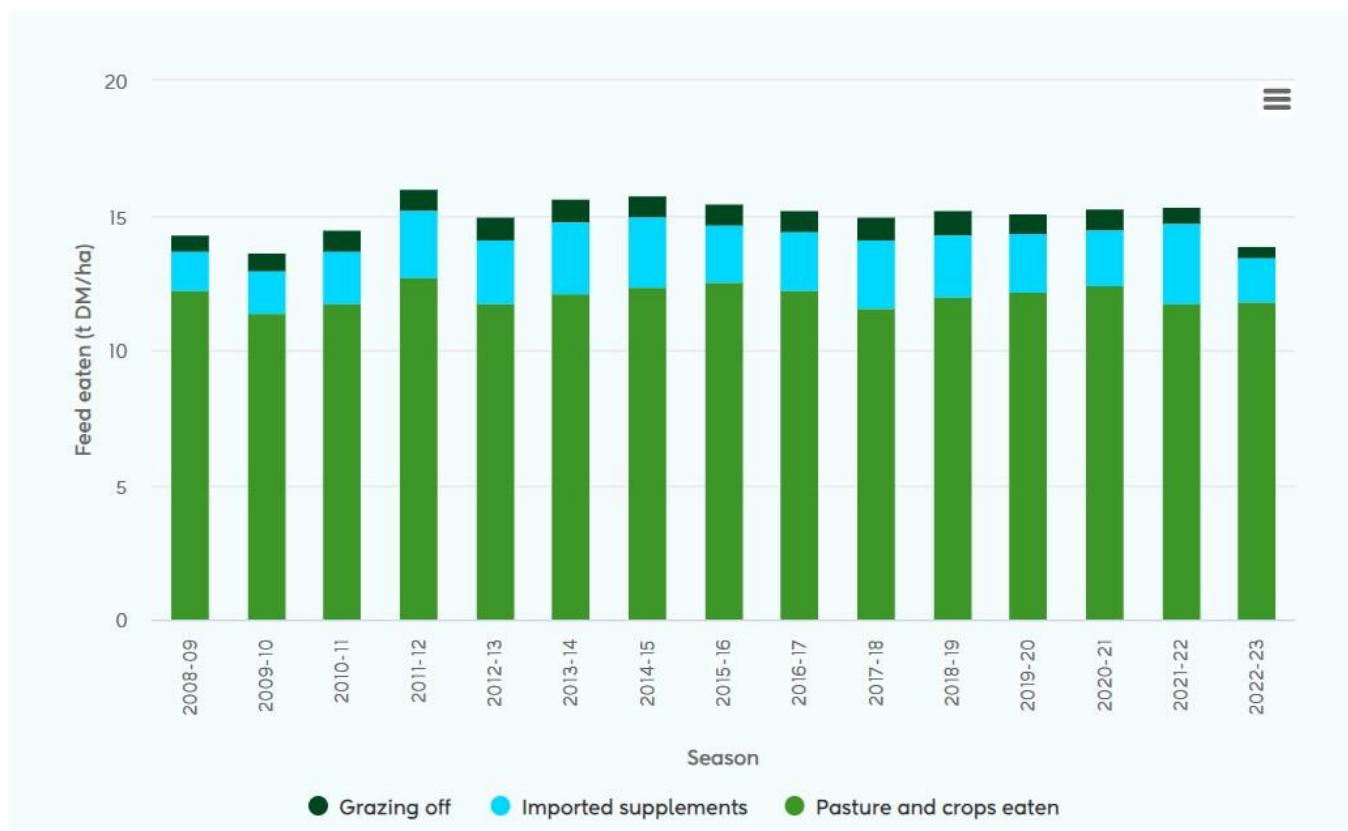


3.3. Feed Use

Pasture and crop eaten, grazing off farm, and imported feed were estimated from the subsample of farms in DairyBase® that completed a physical analysis. Pasture and crop eaten marginally increased from 11.73 tDM/ha in 2021-22 to 11.82 tDM/ha in 2022-23, while the use of imported supplements decreased from 2.97 tDM/ha to 1.62 tDM/ha (Figure 3.2).

In 2022-23, of the total feed eaten per hectare, approximately 85 percent corresponded to pasture and crops eaten, 12 percent to imported supplements and 3 percent to grazing off. On average total feed eaten per hectare decreased in 2022-23 relative to 2021-22 and the 10-year average (15.2 tDM/ha).

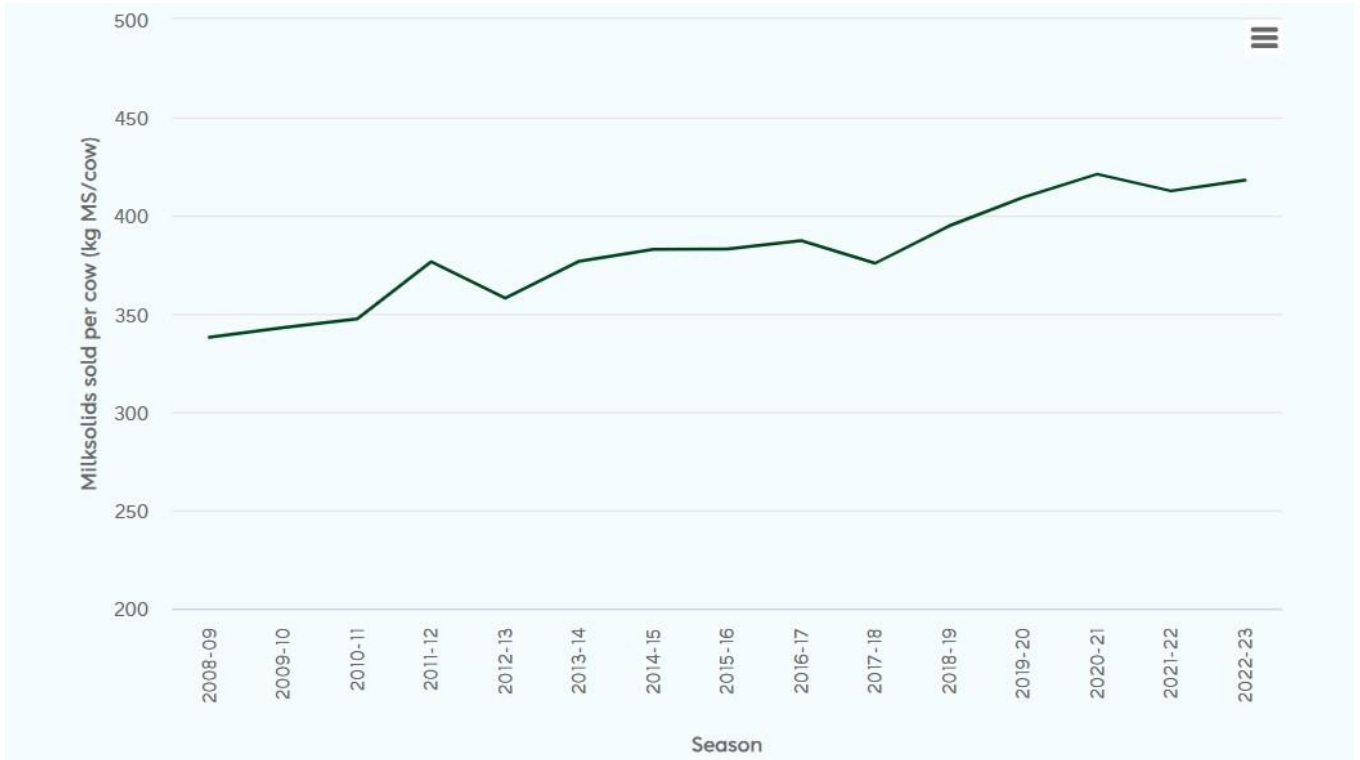
Graph 3.2: Trends in feed use



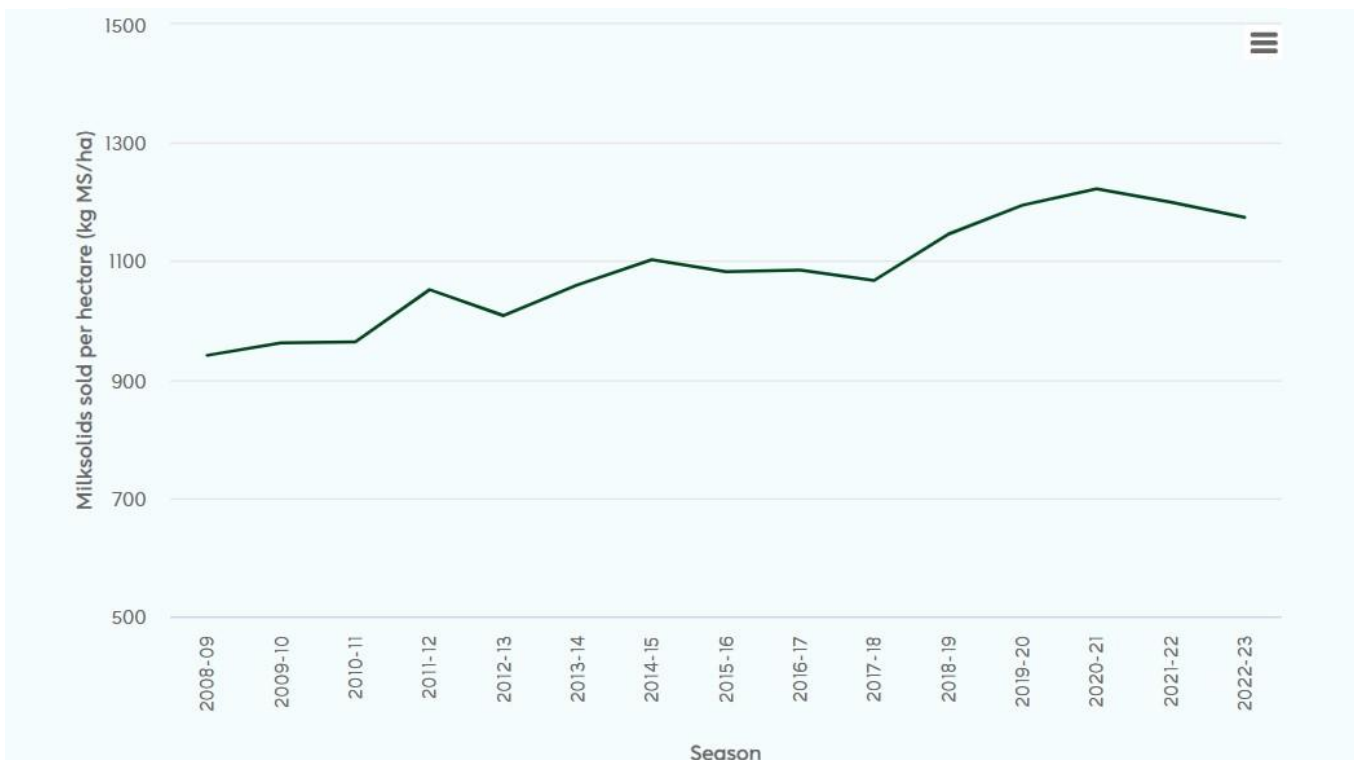
3.4. Partial Productivity

Milk production per cow increased from last season while milk production per hectare decreased from last season (Figure 3.3 and 3.4, respectively). On the average dairy farm in the DairyNZ Economic Survey, milksolids sold per cow increased from 413 kg in 2021-22 to 418 kg in 2022-23. Milksolids sold per hectare decreased from 1,199 kg in 2021-22 to 1,174 kg in 2022-23.

Graph 3.3: Milksolids production per cow

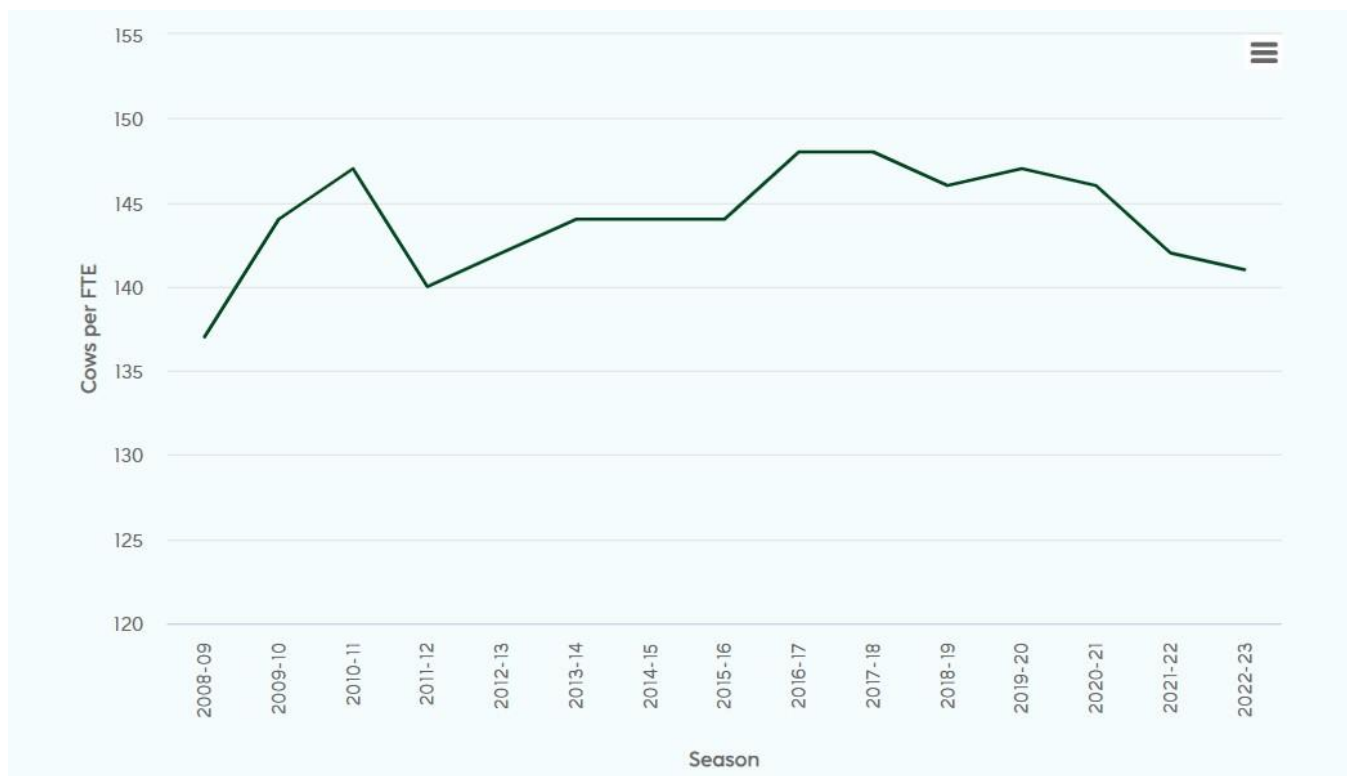


Graph 3.4: Milksolids production per hectare



The number of cows per FTE has decreased slightly in the last four seasons, from 147 cows per FTE in 2019-20 to 141 cows per FTE in 2022-23 (Figure 3.5).

Graph 3.5: Cows per FTE

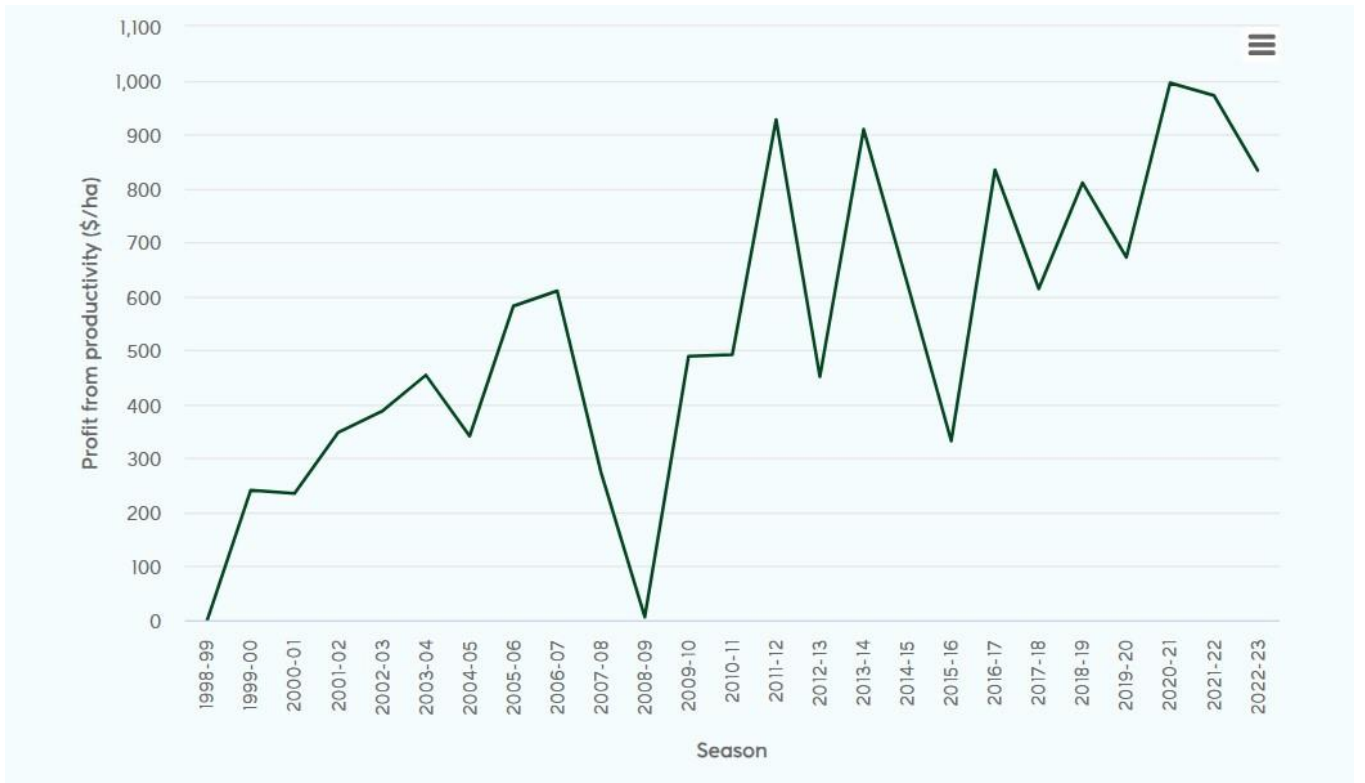


3.5. Profit from Productivity

Productivity improvements over time are essential to sustain or grow business profits and compete successfully with alternative uses for resources. DairyNZ has developed a measure for productivity based on operating profits. Operating profit from productivity (PFP) is defined as the difference between actual operating profit and the operating profit that would have occurred with no productivity changes since a base year (i.e. in the absence of milksolids production increases and with operating expenses per kilogram of milksolids increasing annually at the rate of dairy farm input price inflation), see Figure 3.6. PFP is a measure of cost-efficient milksolids production increases since the base year, valued at the end of the year operating profit margin per kilogram of milksolids. It excludes the cost of capital, although depreciation and changes in hectares are accounted for. The three main contributory components of PFP are milksolids production increases since the base year, operating expenses savings in inflation-adjusted terms since the base year, and end-year operating profit per kilogram of milksolids (influenced by milk prices). DairyNZ and dairy farmers are increasingly focused on achieving cost-efficient milksolids production, and PFP provides a means for monitoring the value of productivity gains over time.

PFP decreased from \$972 per hectare in 2021-22 to \$833 in 2022-23 (1998-99 base year PFP = \$0/ha). Figure 3.6 shows the gains made in PFP were relatively steady from 1990-91 to 2006-07. However, fluctuations in milk prices, seasonal rainfall and inflation have caused PFP to be more volatile since then.

Graph 3.6: Gains in Profit from Productivity



4. Prices Received and Paid

4.1. Milk Payment

In 2021-22, owner-operators in DairyBase® received an average cash payout of \$8.68/kg milksolids sold (net of the industry good levy but includes advance and final payments). This was \$0.51 less than the previous season. The 2022-23 New Zealand Dairy Statistics publication reported an average nominal payout (including dividend payments) of \$9.26/kg MS.

International dairy prices (Graph 4.1) decreased steadily during the 2022-23 season. Between May 2022 and May 2023, the price of whole milk powder, skim milk powder, cheese and butter decreased by 18 percent, 33 percent, 21 percent and 13 percent, respectively.

Graph 4.1: World Milk Commodity Prices (US \$/tonne)



The 2022-23 average nominal milk payout reported by the New Zealand Dairy Statistics publication of \$9.26 per kilogram of milksolids was \$1.00 above the decade average in inflation-adjusted terms (\$8.23) (Graph 4.2). Although the milk payout per kilogram of milksolids decreased in 2022-23, it is still the second highest of the last 9 seasons.

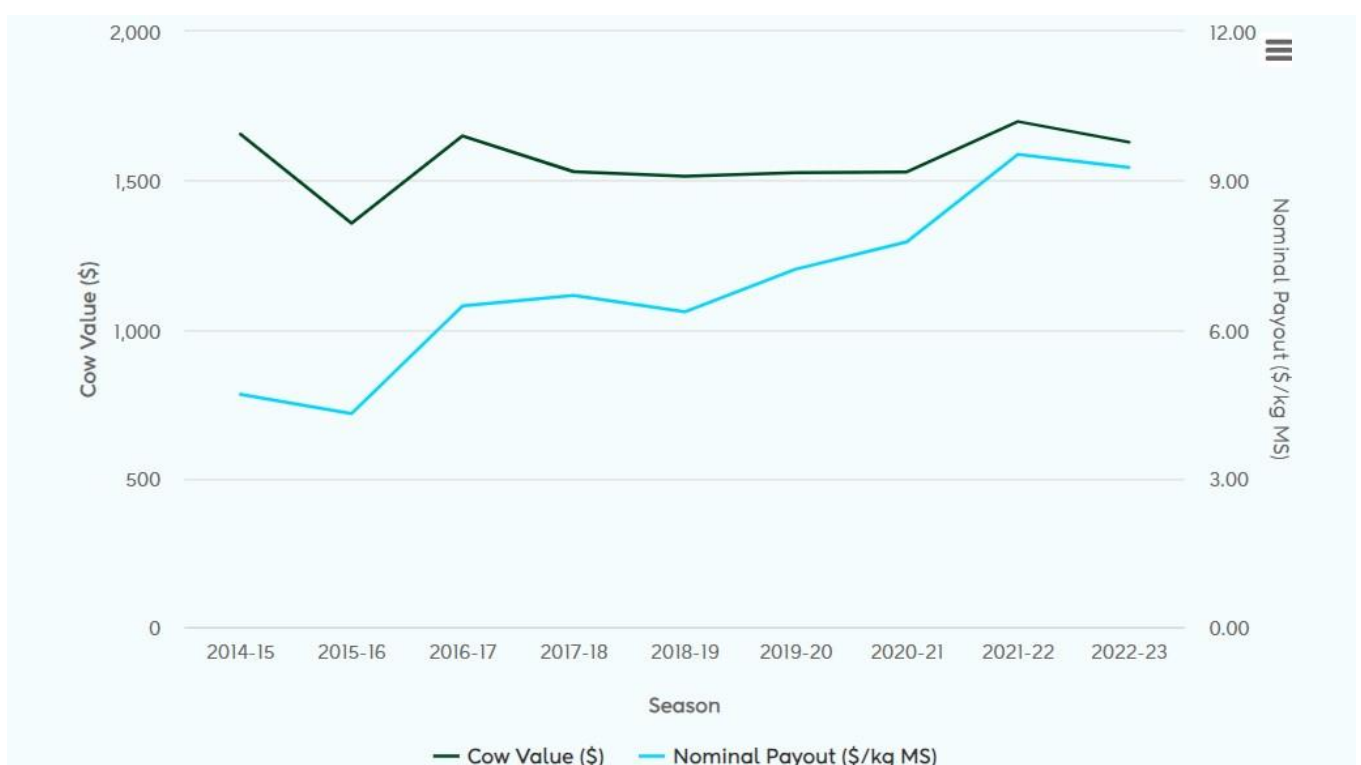
Graph 4.2: Trend in Milk Payout (Nominal and Real)



4.2. Livestock Prices

The value of mixed aged dairy cows decreased to \$1,628 in 2022-23 (from \$1,697 in the 2021-22 season). Dairy cow values, in nominal terms, were close to the decade average of \$1,574. Historically, dairy cow values have followed the trend in milk prices, often with a slight time lag (Graph 4.3).

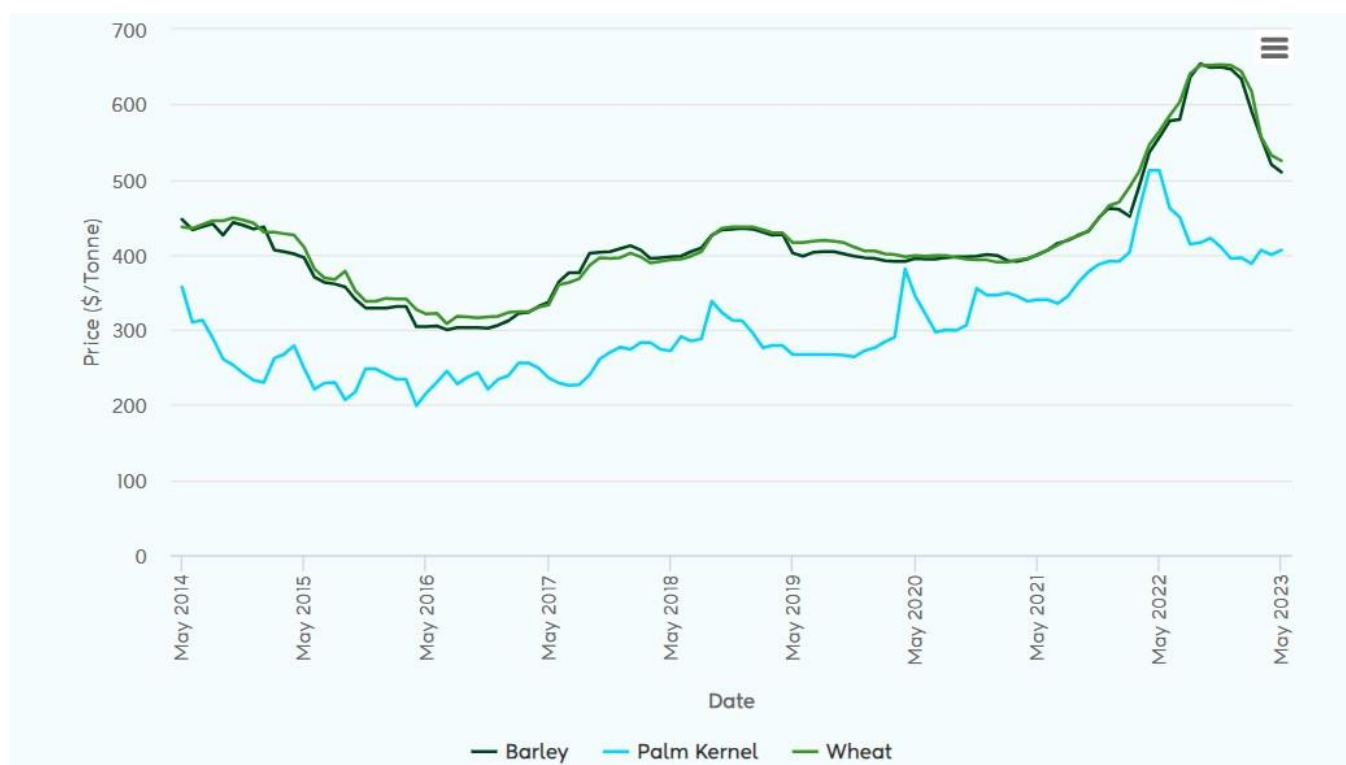
Graph 4.3: Trend in Cow Values Relative to Milk Payout



4.3. Feed and Fertiliser Prices

The price for barley and wheat increased by about 13 percent and 12 percent respectively in the first half of the season and decreased in the second half of the season to values below those observed at the beginning of the season (Graph 4.4). During the 2022-23 season, the price per tonne of barley varied between \$578 (June 2022), \$654 (September) and \$510 (May 2023). The price per tonne of wheat varied between \$585 (June 2022), \$653 (September) and \$525 (May 2023). In contrast to the change in the price of barley and wheat, the price of PKE decreased in the first half of the season (from \$462/tonne in June to \$395/tonne in December) and remained relatively stable in the second half of the season.

Graph 4.4: Feed Prices



During the 2022-23 season the price of urea and Di-Ammonium Phosphate (DAP) fertilisers decreased steadily, especially in the second half of the season (Graph 4.5). The price per tonne of urea decreased from \$1,454 in June 2022 to \$1,330 in January 2023 and \$1,049 in May 2023, this represented a 28 percent decrease in price during the season. The price per tonne of DAP decreased by about 10 percent, from \$1,362 to \$1,229. The price per tonne of superphosphate remained relatively constant, and although it decreased during the middle of the year (from \$497 to \$442), it returned to its opening price by May 2023 (\$500).

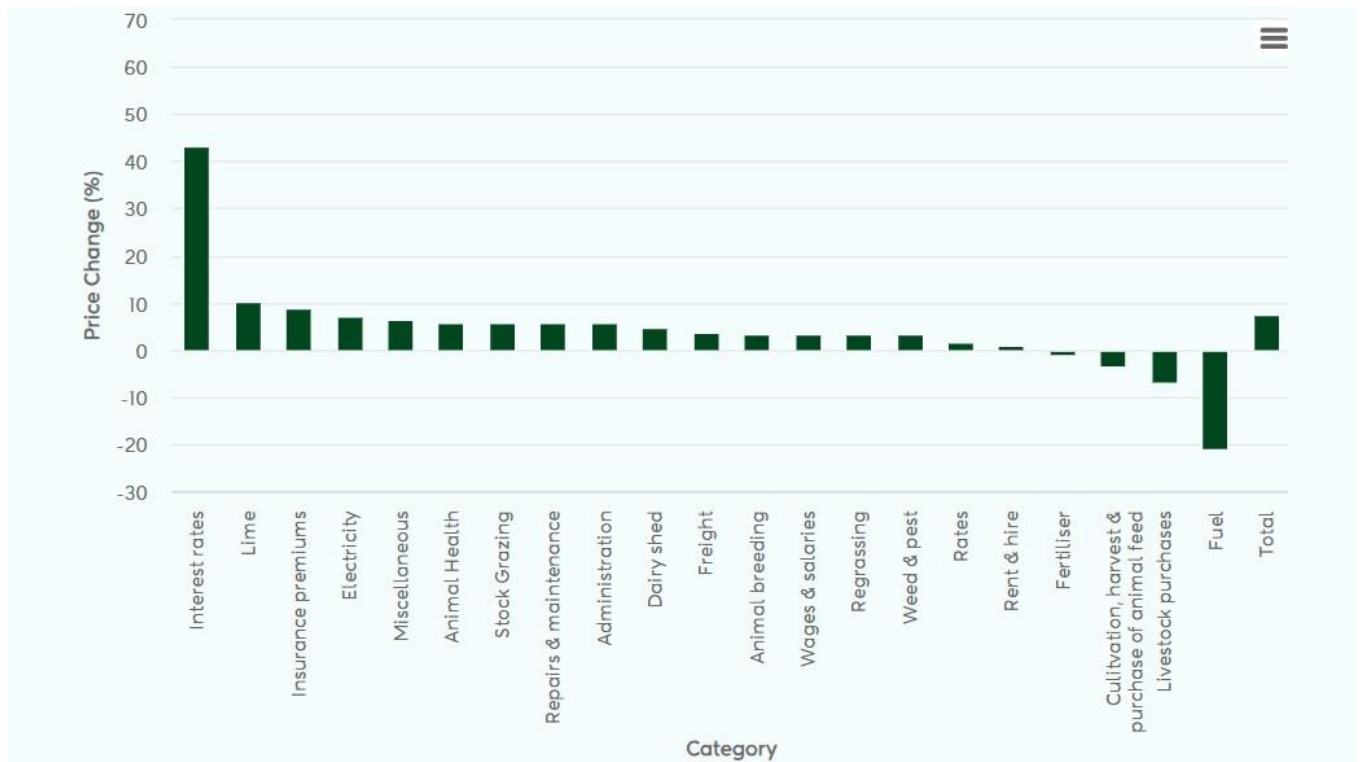
Graph 4.5: Fertiliser Prices



4.4. On-farm Inflation

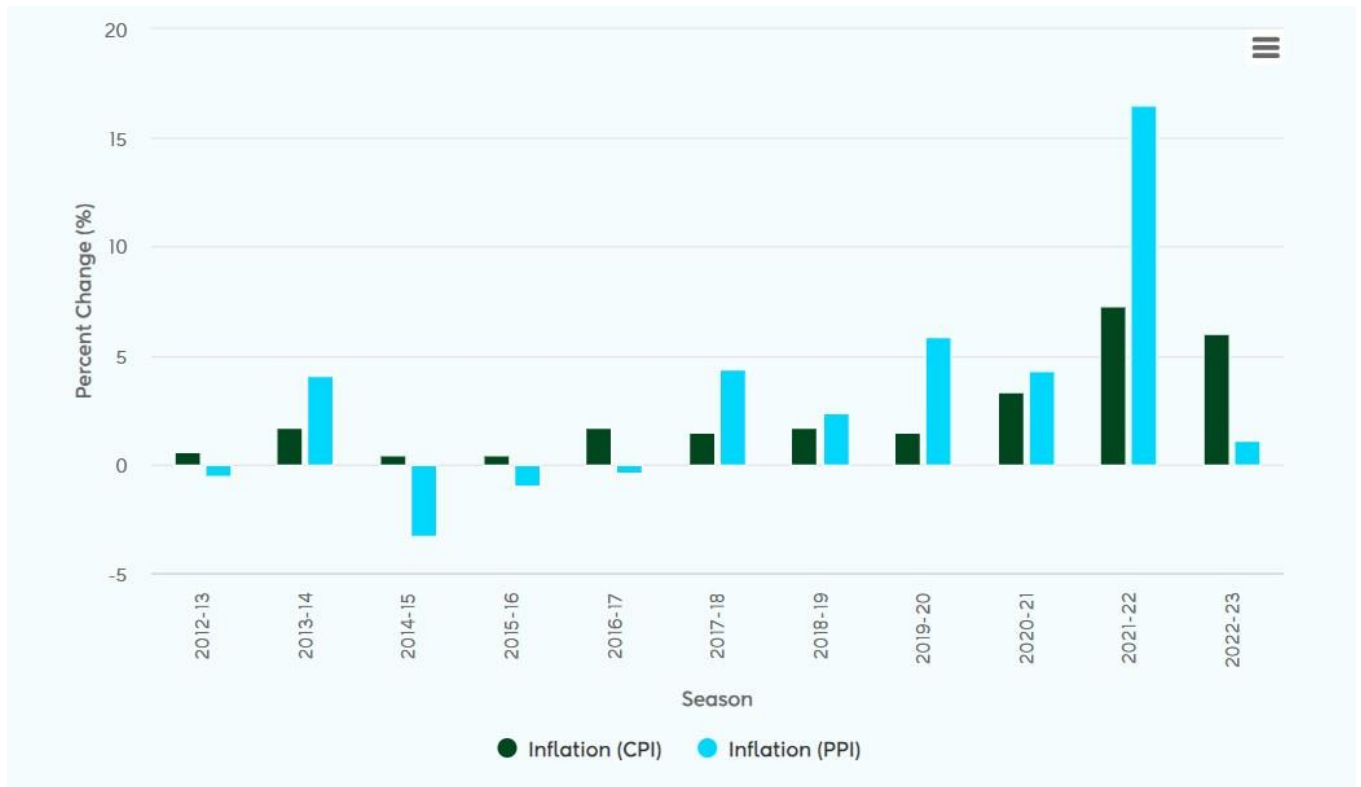
Statistics New Zealand compiles the movement of on-farm input prices in the Farm Expenses Price Index for dairy farms. The percentage movement of each category is weighted by a three-year rolling average of the contribution of each category to total expenditure. In the year to June 2023, the overall change in expense price index was a 7.4 percent increase. The price movements of individual categories for the 2022-23 season are shown in Graph 4.6. The categories that experienced price reductions were fertiliser (-1%), cultivation, harvest & purchase of animal feed (-3%), livestock purchases (-7%) and fuel (-21%). The most notable increase was for interest rates (+43%).

Graph 4.6: Dairy Input Price Changes



The Producer Price Index (Stats NZ NZSIOC Level 3, June 2022 to June 2023) decreased to 1.1 percent, from 16.5 percent the previous year (Graph 4.7). General inflation, as measured by the Consumer Price Index (CPI), decreased from 7 percent to 6 percent in 2022-23, but it was still high compared to other earlier seasons.

Graph 4.7: Dairy Farm Producer Price Index and CPI Changes



5. Owner Operator: Operational Financial Analysis

5.1. Introduction

Dairy operating profit of \$3,017 per hectare in 2022-23 was down 27 percent on the previous season. The milk payout received of \$8.68 per kilogram of milksolids sold was down \$0.51 (about 6 percent) on the average price received in 2021-22. Milksolids sold per cow increased by 5 kg, but milksolids sold per hectare decreased by 25kg in 2022-23. Net livestock income (sales minus purchases) per kilogram of milksolids sold decreased slightly, from \$0.55 in 2021-22 to \$0.51 in 2022-23. Gross farm revenue was \$9.24 per kilogram of milksolids in 2022-23, \$0.57 lower than the previous season. Farm working expenses (FWE) of \$5.75 per kilogram of milksolids was significantly higher (+\$0.43) than the last season. Compared to the previous season, operating expenses increased by \$0.32 in 2022-23 to a record-high of \$6.67 per kilogram of milksolids (third consecutive record-high in a row). The cash available for living and growth in 2022-23 was \$301,982 per farm, 29% lower than the previous season.

5.2. Revenue

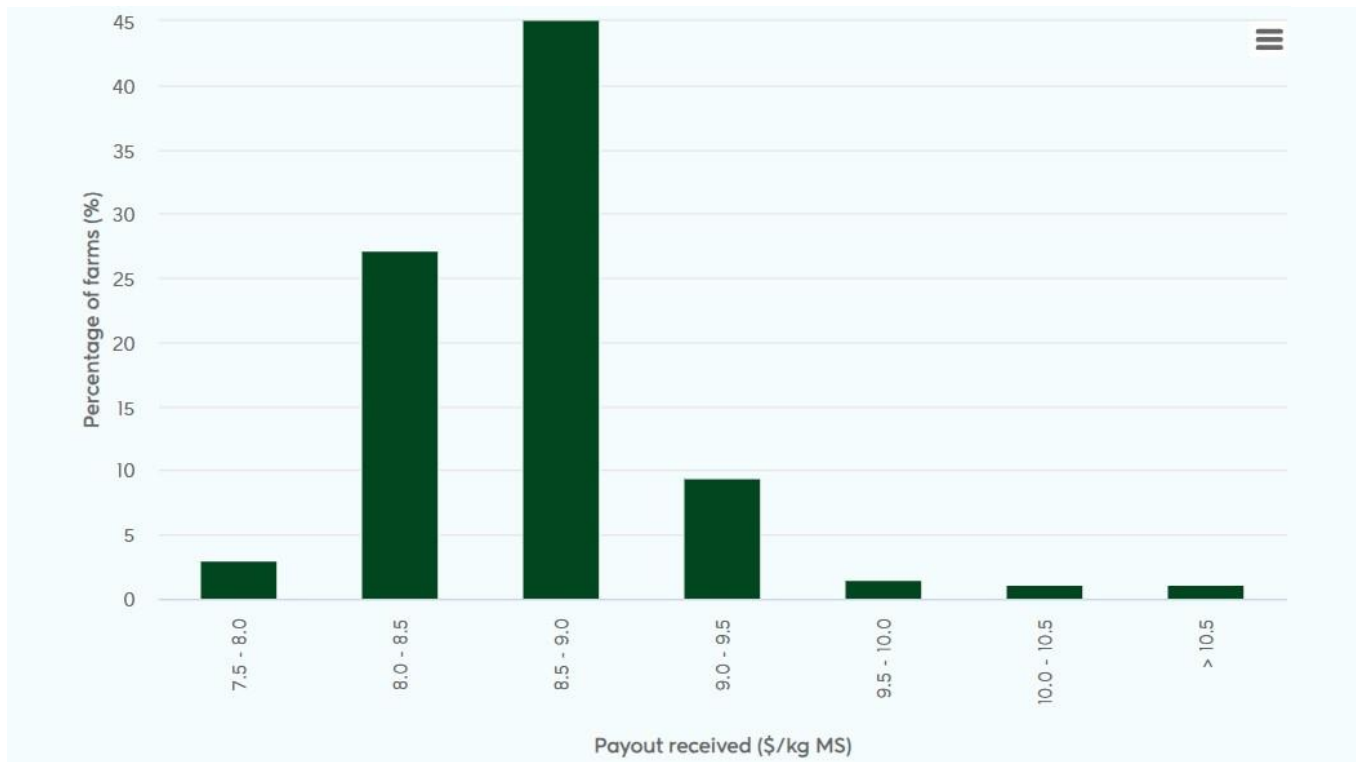
The milk payout received (including dividend payments) in 2022-23 decreased by \$0.51 (about 6 percent) from the previous season to \$8.68 per kilogram of milksolids sold. Milk sales per farm (net of dairy levies) decreased by \$113,169 (about 7 percent) from last season to \$1,570,293, the second highest of the last 10 seasons. Milk revenue in 2022-23 accounted for 94 percent of gross farm revenue. Net revenue from livestock sales decreased by \$8,974 to \$86,782 in 2022-23. Livestock revenue accounted for 5.5 percent of the total gross farm revenue per farm. Table 12.1 describes average revenue per farm, while revenue values normalised by cows and effective hectares can be found in tables 12.2 and 12.3 respectively.

During the 2022-23 season, the milksolids payout (\$/kg MS) received by farmers varied between 7.5 and 10.5 (Graph 5.1). These differences are driven by:

- Variations in the milk composition (fat, protein, lactose, minerals),
- Transport distances,
- Annual account balance dates,
- Milk company supplied,
- Different systems such as organics,
- Penalties incurred,
- Whether the farm operated in the previous season.

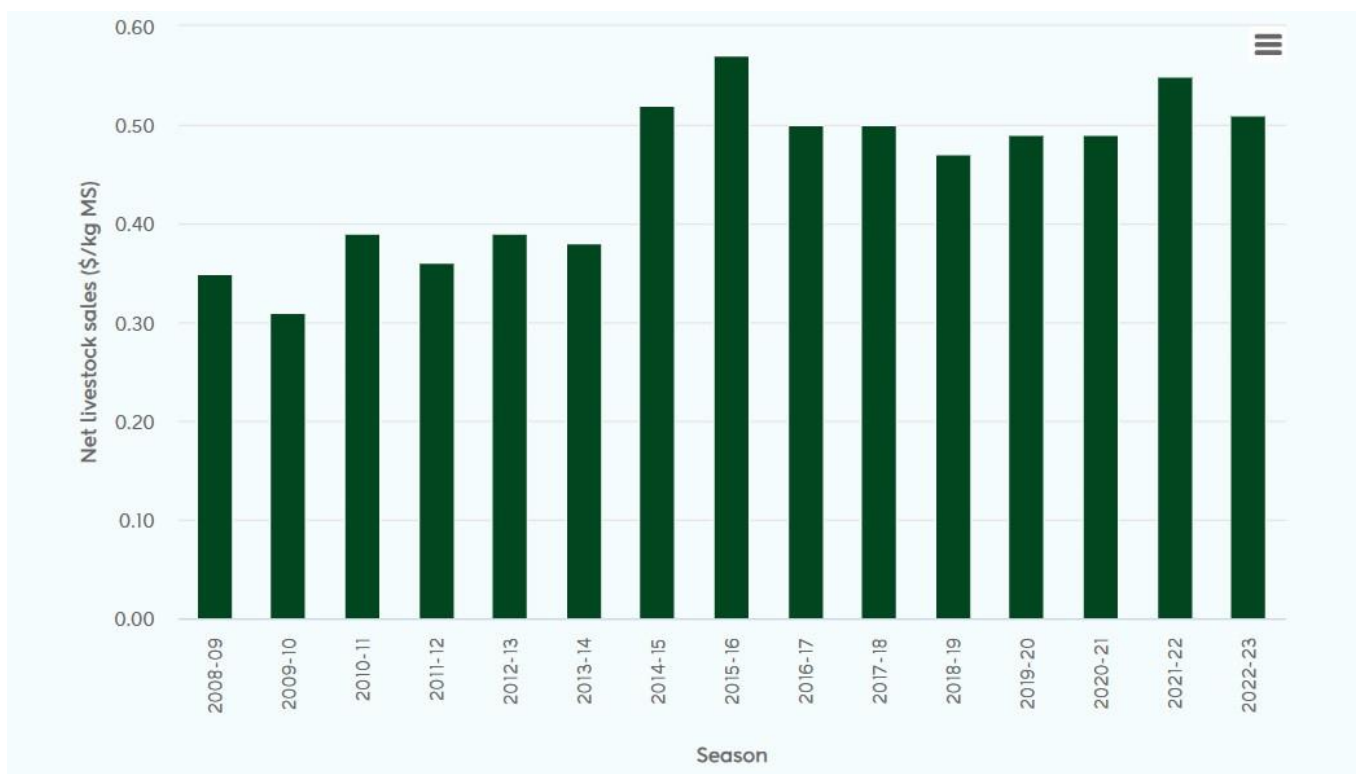
Ninety three percent of farms received a milksolids payout (milk price plus dividend) between \$8.0 and \$9.5 per kilogram of milksolids in 2022-23. The highest percentage was between \$8.50 and \$9.00, with 57 percent of farms receiving a milk payout in this range.

Graph 5.1: Distribution of Milk Payout Received



Cash income from net livestock sales (\$/kg MS) decreased from \$0.55 in 2021-22 to \$0.51 in 2022-23 (-7 percent).

Graph 5.2: Net Livestock Sales (\$/kg MS)



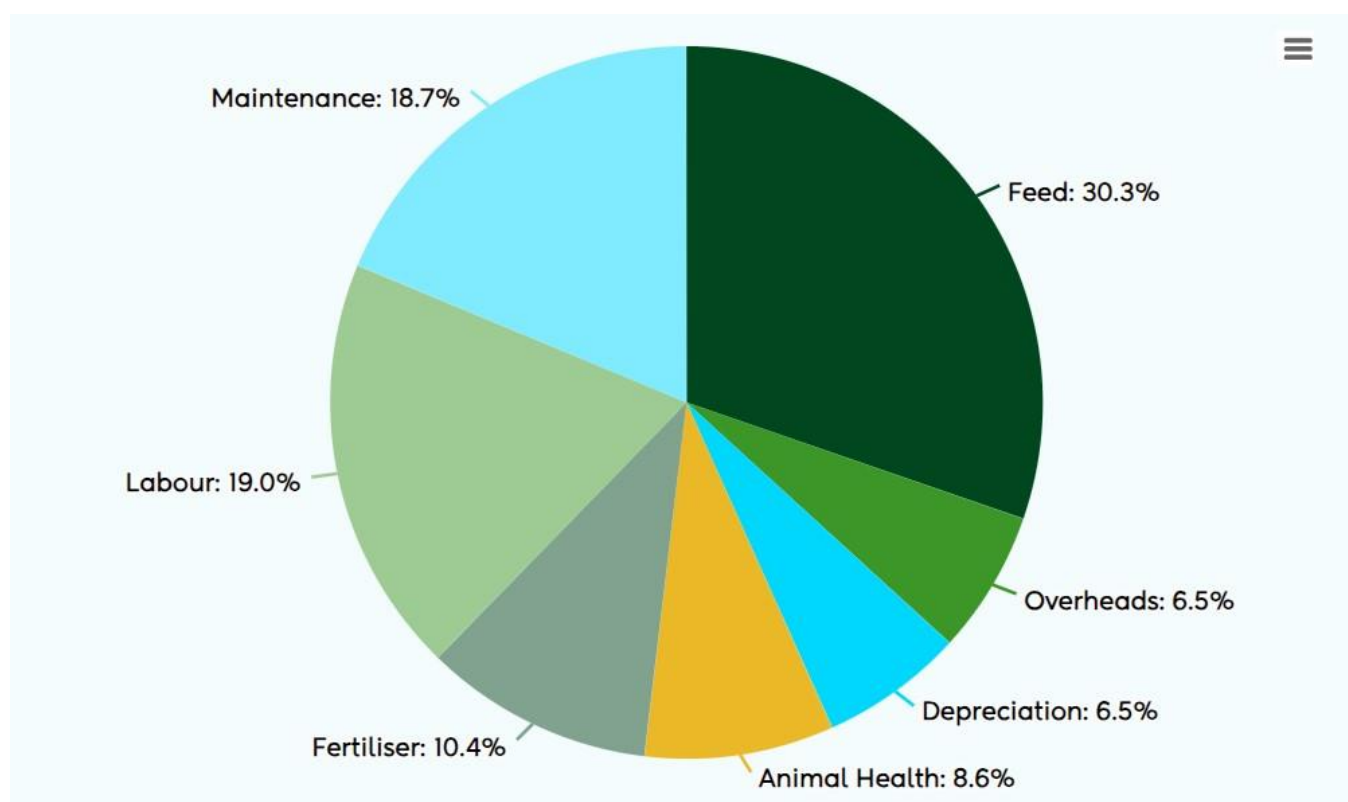
Dairy gross farm revenue on a typical New Zealand dairy farm was \$1,571,170, 7 percent lower than the previous season (\$1,694,953 in 2021-22). On a per hectare basis, gross farm revenue of \$10,851 was 8 percent lower than the per hectare gross farm revenue in 2021-22 (\$11,761). At \$8.68 per kilogram of milksolids, gross farm revenue in 2022-23 was \$0.57 (6%) below the previous season when measured on a per kilogram of milksolids sold basis.

Tables 12.1, 12.2, 12.3 and 12.4 in chapter 12 show net cash income, cash farm working expenses and the adjustments made to calculate operating profit for the average New Zealand owner-operator on a per farm, per cow, per hectare and per kilogram of milksolids sold basis, respectively.

5.3. Expenditure

Graph 5.3 shows the major 2022-23 expenditure categories. Feed continues to be the largest expenditure category at 30.3 percent in 2022-23 and has been the largest expense category since 2007-08. Labour was the second-highest operating expense for dairy farms at 19.0 percent of total operating expenditure. Maintenance and fertiliser contributed 18.7 and 10.4 percent, respectively.

Graph 5.3: Proportion of Dairy Operating Expenditure



Changes in the total farm expenditure are affected by the farm area, herd size and milksolids produced. Therefore, it is more appropriate to consider spending per cow, hectare, or kilogram of milksolids to measure the movement of expenses for individual items. Average farm working expenses (i.e. cash expenses) per kilogram of milksolids increased by \$0.43 (+8%) to \$5.75. This was the highest expenditure recorded in the last 10 seasons.

Dairy operating expenses per kilogram of milksolids were \$6.67, \$0.32 above the 2021-22 season. As with many of the trends over the season this was the highest level of operating expenses in the last decade with a larger change than typically observed. This was the second time that operating expenses per kilogram of milksolids exceeded \$6.

Table 5.1 shows the distribution (%) of dairy expenses in the last 10 seasons. The proportion (%) of feed expenditure in the 2022-23 season (30.3%) was the highest of the last 10 seasons and was associated to the high feed costs and inflation during that season. The proportion of fertiliser expenses in the 2022-23 season (10.4 percent) was also the highest of the last 10 seasons.

Table 5.1: Proportion (%) of Dairy Operating Expenditure in the last 10 years.

Season	Animal health expenditure (%)	Depreciation expenditure (%)	Feed expenditure (%)	Fertiliser expenditure (%)	Labour expenditure (%)	Maintenance expenditure (%)	Overheads expenditure (%)
2013-14	8.1	7.5	27.7	11.6	19.2	19.8	6.1
2014-15	8.6	8.5	27.2	10.1	20.8	18.3	6.5
2015-16	7.8	9.2	26.5	9.9	22.6	17	7
2016-17	8.6	9.2	24.6	10.2	21.4	19	7
2017-18	8.6	8.7	25.4	9.9	21.1	19.8	6.5
2018-19	8.6	8.2	27.9	9.1	20.5	18.8	6.9
2019-20	8.9	8.2	27.2	9.2	20.2	19.6	6.7
2020-21	8.8	7.9	27.9	8.8	20.3	19.5	6.8
2021-22	8.6	7.1	28.9	9.6	19.1	20.1	6.6
2022-23	8.6	6.5	30.3	10.4	19	18.7	6.5

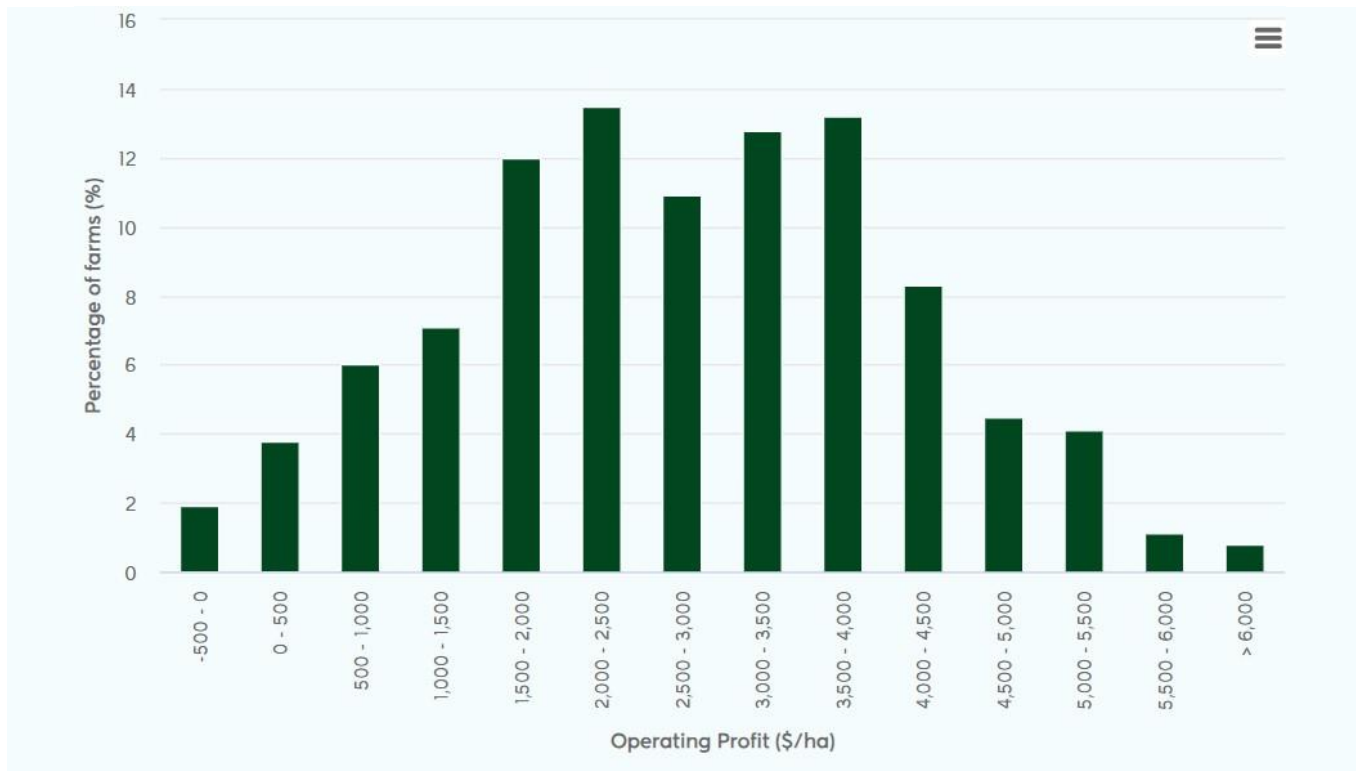
Table 12.4 shows the changes in the categories of operating expenses per kilogram of milk solids. Many of these expenses have followed close to their long-term trend. Feed and fertiliser saw increases greater than the preceding years, driving up dairy operating expenses and therefore there is a large variation in operating expenses from 2021-22 to 2022-23.

5.4. Profitability

Operating profit is a key indicator of dairy farm financial performance. This measure, expressed on a per hectare basis, is beneficial for comparing the profitability between farms. Operating profit incorporates adjustments to allow comparisons between farms, but does not include interest, tax, rent payments or capital expenditure. Table 12.3 shows the revenue and expenditure items included in operating profit on a per hectare basis.

Graph 5.4 shows the distribution of 2022-23 operating profit per hectare. Operating profit per hectare was distributed around the mean (\$3,017) per hectare, reflecting a wide range between farms. More than 87 percent of farmers had operating profits between \$0 and \$4,500 per hectare, while 10.5 percent of farmers had operating profits over \$4,500 per hectare. In contrast to the 2021-22 season where no farmers had a negative operating profit per hectare, 1.9 percent of farmers recorded a negative operating profit in 2022-23 (Graph 5.4).

Graph 5.4: Distribution of Owner-operating Profit (\$/hectare)



Graph 5.5 shows the distribution of operating profit (\$/ha) in the last ten seasons. The distribution of operating profit has noticeable shifts across seasons, and it is clearly influenced by the milksolids payout received (\$/kg milksolids sold), with a higher spread at high payouts and a narrower spread at lower payouts. In 2022-23, the range in operating profit (\$/ha) was smaller than in the previous season, with 50% of farms (between the 25th and 75th percentile) having an operating profit per hectare spanning \$1,919 (between \$1,793 and \$3,712), and 10% of farms having an operating profit per hectare below \$889.

Graph 5.5: Distribution of operating profit (\$/ha) in the last 10 seasons

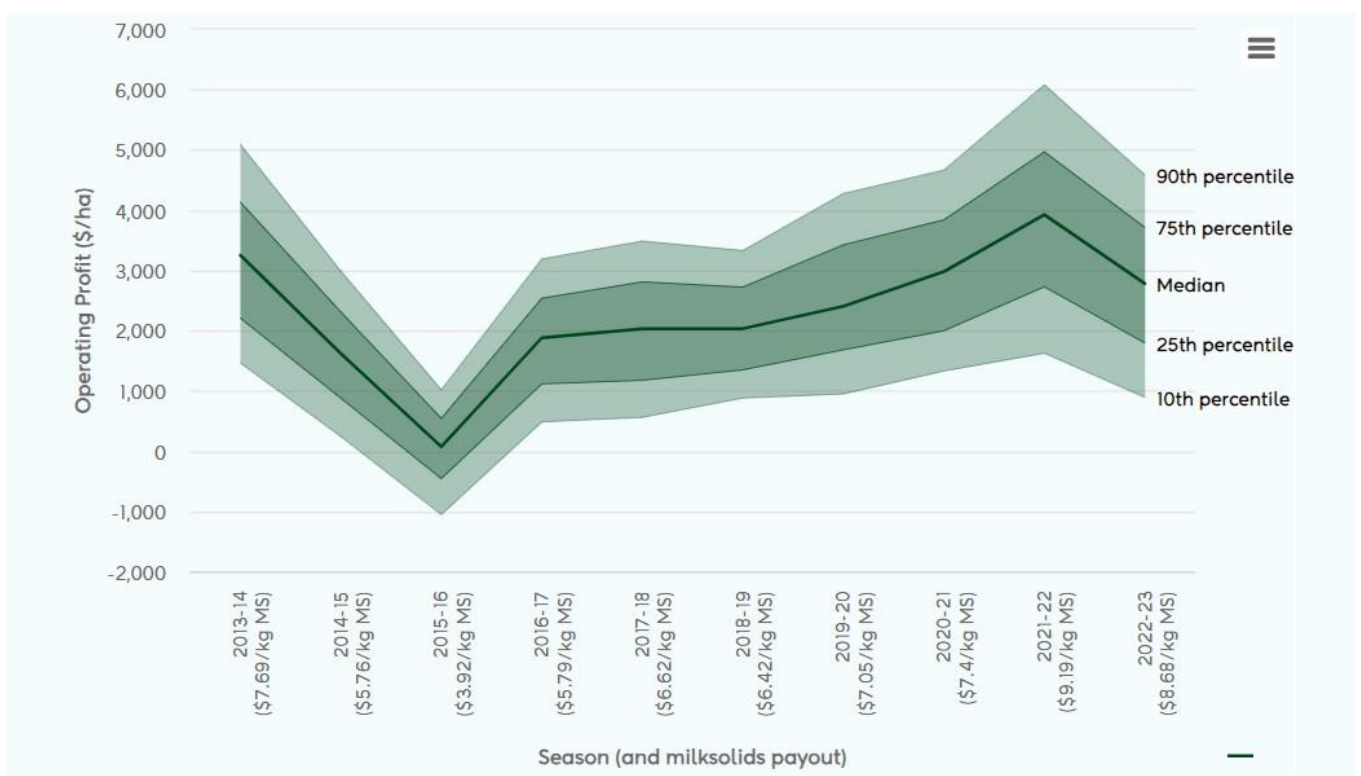


Table 5.2 and Table 5.3 show the average size and profitability of farms by quartile. Quartiles were constructed by ranking surveyed farms on operating profit per hectare across New Zealand. Top quartile farms average \$4,575 operating profit per hectare, compared with \$1,065 for the bottom quartile group. Each quartile group produced more milksolids per hectare compared with the quartile lower. Top quartile farmers produced approximately 45 percent more kilograms of milksolids per hectare than the bottom quartile farmers, with substantially lower farm working expenses per kilogram of milksolids (-25%).

There is minimal difference in gross farm revenue per kg MS across the quartiles. The differences in profit per kilogram of milksolids between the quartiles is mainly driven by significant differences in the groups operating expenses per kilogram of milksolids. Top farms are more efficient as demonstrated by their lower operating expenses per kilogram of milksolids. Operating expenses per kilogram of milksolids increased from the top quartile group to the bottom quartile group from \$5.80 to \$8.03, respectively.

Table 5.2: 2022/23 Owner-operator Quartile Profit (\$/kg MS)

Variable	Bottom Quartile	Lower Middle Quartile	Upper Middle Quartile	Top Quartile
PHYSICAL CHARACTERISTICS				
Number of herds	67	67	66	66
Effective hectares	128	144	138	140
Peak cows milked	307	376	388	436
Stocking rate (cows/ha)	2.4	2.6	2.8	3.1
Kg milksolids sold	117,350	145,123	164,302	189,863
Milksolids sold per hectare	914	1,026	1,193	1,328
Milksolids sold per cow	371	391	420	432
PAYOUT RECEIVED (\$/kg MS sold)	8.66	8.69	8.68	8.70
DAIRY CASH INCOME (\$/kg MS):				
Milk sales (net of dairy levies)	8.63	8.68	8.69	8.70
Net livestock sales (sales - purchases)	0.66	0.57	0.55	0.39
Other dairy cash income	0.08	0.06	0.04	0.04
Net dairy cash income	9.36	9.31	9.28	9.13
CASH FARM WORKING EXPENSES (\$/kg MS):				
Wages	0.75	0.90	0.73	0.69
Animal health	0.37	0.31	0.33	0.27
Breeding & herd improvement	0.21	0.18	0.18	0.17
Farm dairy	0.11	0.08	0.07	0.07
Electricity	0.14	0.14	0.12	0.10
Net feed made, purchased, cropped	1.91	1.59	1.61	1.19
Stock grazing	0.42	0.31	0.36	0.61
Support block lease	0.07	0.10	0.07	0.03
Fertiliser (including Nitrogen)	0.86	0.76	0.73	0.55
Irrigation	0.01	0.03	0.03	0.14
Regrassing	0.11	0.10	0.09	0.07
Weed & pest	0.05	0.05	0.04	0.03

Vehicles & fuel	0.36	0.32	0.25	0.20
Repairs & maintenance	0.69	0.50	0.49	0.44
Freight & general	0.13	0.11	0.08	0.07
Administration	0.18	0.18	0.16	0.18
Insurance	0.14	0.12	0.10	0.09
ACC	0.04	0.04	0.03	0.03
Rates	0.14	0.13	0.12	0.10
Farm working expenses	6.68	5.95	5.59	5.02
Cash operating surplus	2.68	3.36	3.68	4.11
ADJUSTMENTS (\$/kg MS):				
Value of change in dairy livestock	-0.18	0.04	0.02	0.05
Less labour adjustment	0.78	0.57	0.51	0.38
Plus feed inventory adjustment	0.05	0.12	0.12	0.07
Less owned support block adjustment	0.11	0.19	0.11	0.09
Less depreciation	0.51	0.48	0.44	0.38
Net Adjustments	-1.52	-1.08	-0.91	-0.73
OPERATING CASH & NON-CASH (\$/kg MS):				
Dairy gross farm revenue	9.19	9.35	9.30	9.18
Dairy operating expenses	8.03	7.07	6.53	5.80
Dairy operating profit	1.16	2.28	2.77	3.38
OPERATING CASH & NON-CASH (\$/ha):				
Dairy gross farm revenue	8,438	9,401	11,051	12,426
Dairy operating expenses	7,374	7,109	7,760	7,852
Dairy operating profit	1,065	2,292	3,291	4,575
Operating profit margin (%)	12.7	24.7	30.9	37.5

In 2022-23, the operating return on dairy assets ranged from 2.5 percent in the bottom quartile to 7.8 percent in the top quartile, a range of 5.3 percentage points (Table 5.3). This range in operating return on dairy assets (difference between the top quartile and the bottom quartile) was slightly smaller than the one observed in 2021-22 (5.8 percent).

Table 5.3: 2022/23 Owner-operator Quartile Financial Position

Variable	Bottom Quartile	Lower Middle Quartile	Upper Middle Quartile	Top Quartile
RETURNS:				
Operating return on dairy assets %	2.5	5.0	6.0	7.8
Total return on assets %	3.8	5.6	4.7	5.7
Total return on equity %	1.8	6.3	5.8	7.6
Growth in equity %	5.6	7.0	2.1	2.9
DEBT:				
Closing term liabilities (\$/kg MS sold)	22.25	20.79	22.78	23.83
Closing debt to asset %	41.2	39.4	41.2	47.8

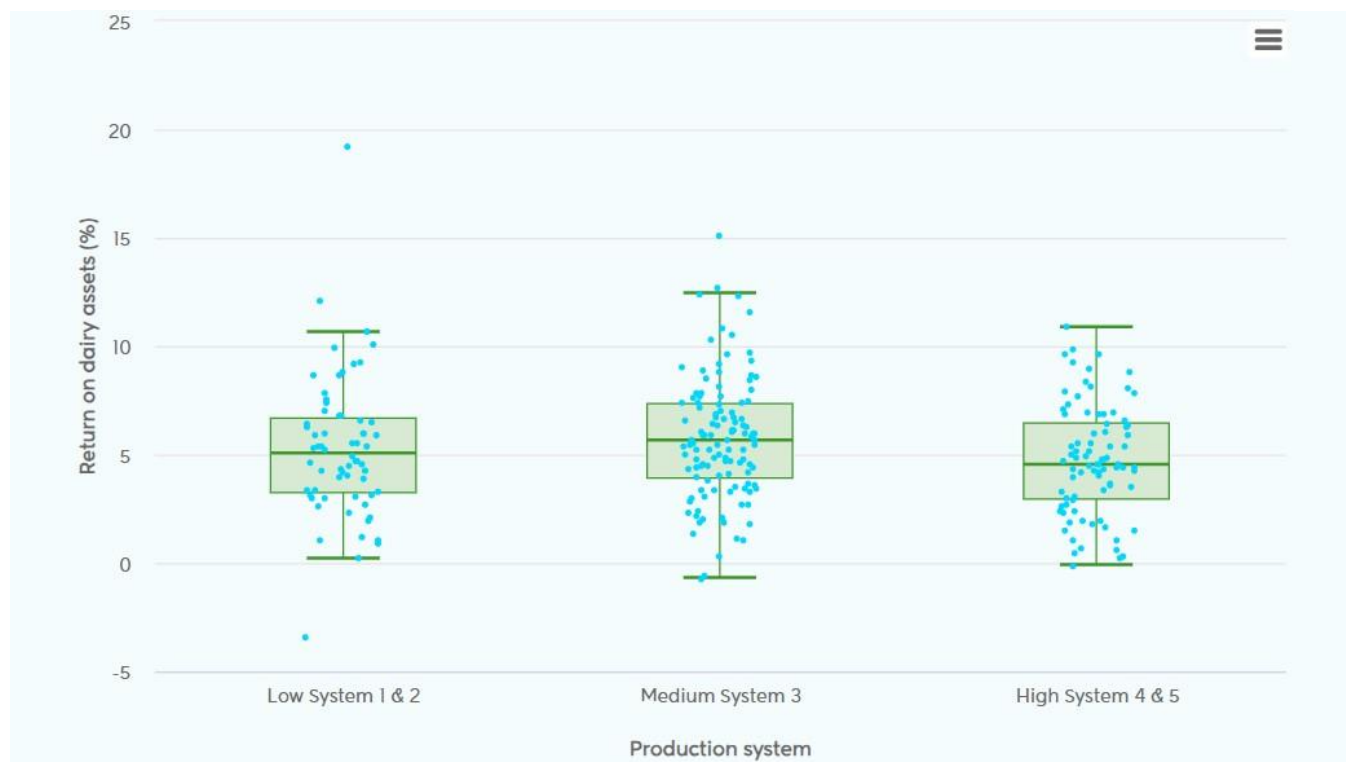
Measuring the cost efficiency of milksolids production (operating expenses/kg MS) relative to milksolids payout is more relevant than production or expenditure alone when focusing on how to achieve high profit margins. The last two rows in Table 5.4 denote the strength of the association between these variables. A value of 0 percent denotes no association, while a value of 100 percent denotes a perfect association. In the 2022-23 season, the relationship between dairy operating profit per hectare and kilograms of milksolids sold per hectare was lower (R2= 0.4) than in the previous 3 seasons (R2= 0.5). The relationship (R2) between dairy operating profit (\$/ha) and operating expenses (\$/kg MS) is moderate and had varied between 0.5 and 0.6 in the last 10 seasons.

Table 5.4: Relationship (R2) between Production, Profit and Operating Expenses

Variable	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Payout received (\$/kg MS)	7.69	5.76	3.92	5.79	6.62	6.42	7.05	7.40	9.20	8.68
Milksolids (kg MS/ha)	1,060	1,102	1,082	1,085	1,067	1,145	1,125	1,154	1,143	1,114
Dairy operating expenses (\$/kg MS)	5.17	4.94	4.45	4.60	5.13	5.10	5.47	5.44	6.51	6.84
Dairy operating profit (\$/ha)	3,295	1,537	-9	1,937	2,238	2,154	2,540	2,976	3,920	2,775
R2 (%) - dairy operating profit \$/ha & kg MS/ha	0.5	0.2	0.0	0.3	0.4	0.4	0.5	0.5	0.5	0.4
R2 (%) - dairy operating profit \$/ha & operating expenses \$/kg MS	0.5	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6

Operating return on dairy assets is a measure of the operating profit generated by the dairy assets employed at the start of the season. This measure excludes non-dairy activities and any change in capital value. The average operating return on dairy assets was 5.4 percent in 2022-23. Grouping farm systems into low (systems 1 and 2), medium (system 3) and high input (systems 4 and 5) show that the median operating return on dairy assets was highest for medium input farms (5.6%, Graph 5.6). There was a significant difference in the variation of operating returns on dairy assets within the groups, with the highest range in the low input farms (-3.5% to 19.2%) and the lowest range in the high input farms (-0.1% to 10.9%).

Graph 5.6: Return on Dairy Assets Distribution



Business profit before tax is another measure of profitability that considers the cost of borrowing and other non-dairy activities. This is the overall profitability of the business enterprise and not just the dairy farm operation (Table 5.5).

Table 5.5: 2022/23 Business Profit before Tax

Variable	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
BUSINESS PROFIT (\$):										
Dairy operating profit	470,808	223,630	-1,291	286,227	338,871	314,435	390,831	449,132	598,081	436,843
Plus labour adjustment	59,309	59,021	56,341	61,154	63,920	62,545	62,011	70,195	79,852	80,362
Plus owned support block adjustment	15,338	14,889	14,126	14,359	16,786	13,143	16,151	16,720	18,843	20,738
Plus net non-dairy profit	1,724	-673	-318	3,331	5,444	6,904	11,894	3,870	5,499	5,136
Plus net off-farm income	9,991	12,078	9,238	19,811	18,114	6,670	13,167	9,838	-199	36,366
Less rent (excluding support block)	23,366	22,250	20,047	19,582	20,703	12,499	17,280	17,069	14,929	13,227
Less interest	171,597	195,984	197,277	197,343	191,459	194,022	172,460	140,608	149,895	217,165
Business profit before tax	362,074	90,731	-139,258	167,789	231,251	197,163	304,312	392,077	537,252	349,052
Business profit before tax (\$/total hectares)	1,981	478	-734	887	1,174	1,077	1,681	2,131	2,868	1,834

Note:

- Total hectares = Total effective hectares (effective dairy + effective dairy support block + effective non-dairy).

On average, total effective hectares (effective dairy + effective dairy support block + effective non-dairy) increased by three hectares from the previous season to 190 hectares. The average dairy farm in 2022-23 made a business profit before tax of \$349,052. This business profit is equivalent to \$1,834 per total effective hectare, \$1,034 less than the previous year. The dairy operating profit per farm decreased by \$161,238, to \$436,843, compared to the previous season. Rent payments decreased by 11 percent (from \$14,929 to \$13,227). Interest payments per farm in 2022-23 (\$217,165) were the highest of the last 10 seasons, and \$67,270 (45%) higher than the previous season.

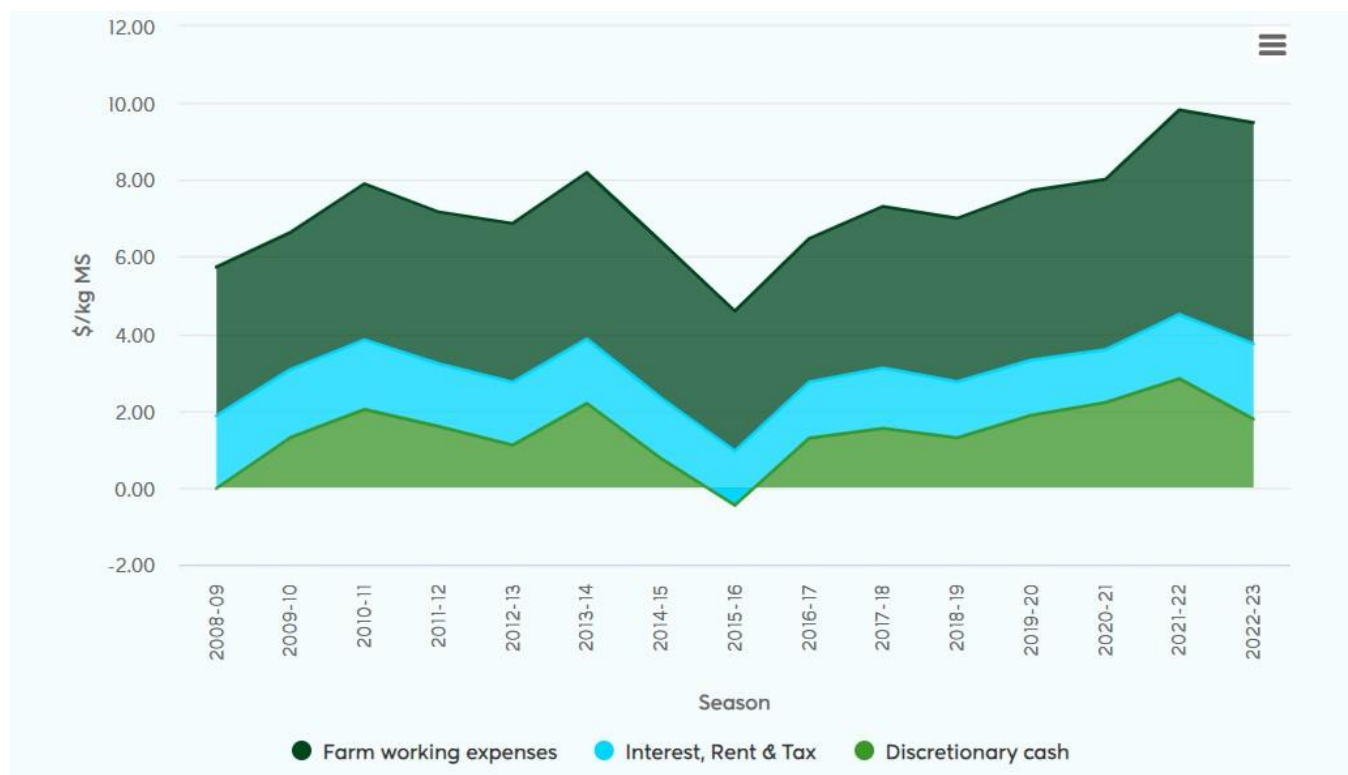
5.5. Cash Flow

The cash operating surplus is the difference between net dairy cash income and farm working expenses. In 2022-23 the cash operating surplus was \$593,495, constituting a 23 percent decrease from 2021-22. On a per kilogram of milksolids basis, the cash operating surplus in 2022-23 was \$3.49, down 22 percent from the previous season. Once rent, interest and tax are paid, and net income from non-dairy farming activities are added, the amount left is discretionary cash. Total discretionary cash in 2022-23 was \$302,861, equating to \$1.78 per kilogram of milksolids, 38% lower than the previous season (Table 12.5).

Many farm businesses include cash funds and off-farm income in their annual accounts. The cash available after including these activities and any change of funds deposited or withdrawn from the IRD Income Equalisation Scheme is the cash available for drawings, debt repayments and/or capital development and purchases. Cash available for living and business growth in 2022-23 was \$301,982 per farm, lower than the previous 2 seasons.

On a per kilogram of milksolids basis, compared to the previous year, Interest, Rent & Tax increased by 17 percent (to \$1.96), Farm working expenses increased by 8 percent (to \$5.75) and Discretionary Cash decreased by 37 percent (to \$1.78) in 2022-23 (Graph 5.7).

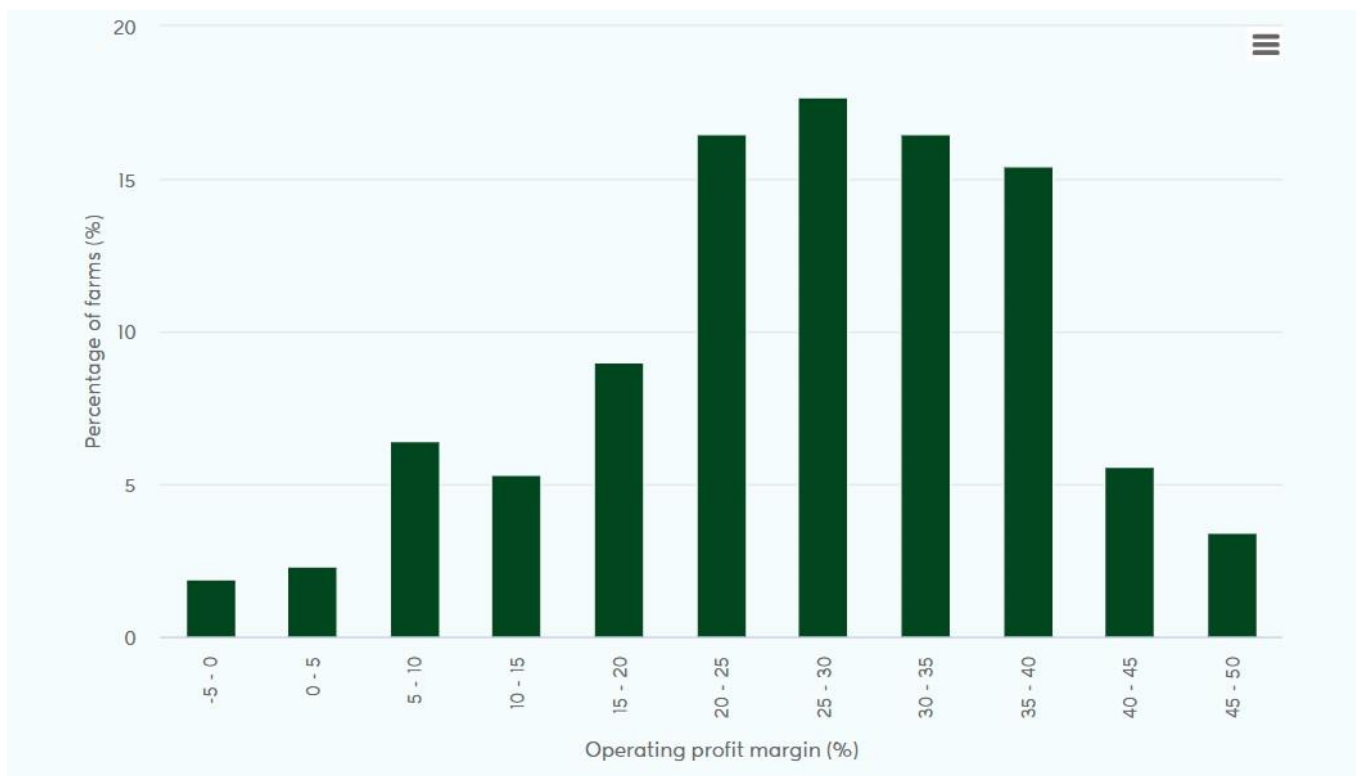
Graph 5.7: Annual Change in Revenue and Expenditure Over the Last 10 Years (\$/kg MS)



5.6. Operating Profit Margin

Operating profit margin is an indicator of dairy farm financial performance. This measurement is expressed as a percentage and describes the proportion of gross farm revenue converted to profit (Operating profit/Gross farm revenue). The ability of a farmer to convert a high proportion of their revenue to profit indicates that the farm is cost-efficient and better placed to deal with financial and production risks. The average operating profit margin in 2022-23 was 28 percent, down 7 percentage points from the 2021-22 season (35 percent). Graph 5.8 shows the distribution of operating profit margin in 2022-23. Ninety two percent of farms had an operating profit margin between 5 and 45 percent, with 3.4 percent of farms having an operating profit margin above 45 percent and 1.9 percent of farms having a negative operating profit margin.

Graph 5.8: Distribution of Operating Profit Margin (%)



6. Owner Operator: Equity and Capital Financial Analysis

6.1. Introduction

This section considers owner-operator dairy farms' equity and capital position, with additional information about trends over time.

Following significant reductions in capital expenditure and a moderate reduction in net debt, a cash surplus of \$44,541 per farm was recorded in the 2022-23 season, a \$41,998 increase from the one in 2021-22 season (\$2,543). The 2022-23 cash surplus is significantly above the 10-year average of \$10,654, but below the cash surplus generated in the 2016-17 (\$66,272), 2019-20 (\$57,909) and the 2020-21 (\$59,112) seasons (Table 12.5). The operating return on dairy assets decreased from 7.6 percent in 2021-22 to 5.4 percent in 2022-23, and the total return on equity decreased from 11.5 percent in 2021-22 to 3.5 percent in 2022-23 (Table 12.7). Total liabilities as a percentage of total assets (debt to asset ratio) decreased to 44.4 percent at the end of the season, a steady decrease from the peak of 53.4 percent in 2018-19, and close to the levels of nine and ten years ago. Closing term liabilities per kilogram of milksolids decreased to \$22.22, the second lowest of the last ten seasons.

6.2. Dairy Assets

Compared to the 2021-22 season, the number of dairy farms sold in 2022-23 decreased by 30 percent (60 farms) to 140. The REINZ average sales price per kilogram of milksolids and per hectare for the last 10 seasons is shown below in Table 6.1. Hectares are measured as total rather than effective area, which is generally used in this publication. The analysis only includes farms considered to be economic units. Raw data from REINZ prior to 2019-20 was weighted by the number of farms in each region, but from 2019-20 figures have not been weighted. The average dairy land price per kilogram of milksolids increased to \$37 in 2022-23, \$2 higher than in the previous two seasons, but similar to that of the 2019-20 season. However, this value is still below the peak of \$44 observed in the 2014-15 season.

Table 6.1: Average Sales Price and Number of Dairy Farms Sold

Variable	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Farms sold	312	244	192	217	226	148	113	198	200	140
Average \$ sale price/kg MS	42	44	39	40	40	38	37	35	35	37
Average \$ sale price/ha	36,369	39,577	36,557	37,835	38,015	36,846	33,410	31,393	34,427	34,600
Average \$ sale price/ha (Inflation adjusted)	45,918	49,764	45,780	46,575	46,105	43,951	39,281	35,716	36,503	34,600
CPI	975	979	983	1,000	1,015	1,032	1,047	1,082	1,161	1,231

Note: - Inflation-adjusted value (real dollar value) has been estimated using the Consumers Price Index for the end of the June quarter (Sourced from Statistics New Zealand)

6.3. Liabilities and Debt Servicing

Interest is the cash cost of borrowing funds, while rent is the cost of borrowing assets. Interest and rent per kilogram of milksolids decreased steadily in recent years, from \$1.36 in 2014-15 and 2015-16 to \$0.95 in 2021-22, but in 2022-23 it increased back to its 2014-15 and 2015-16 value (\$1.36) (Table 6.2). Interest and rent represented 14.7 percent of gross farm revenue, 5 percentage points higher than in the previous season. This means that for every dollar of gross income earned \$0.147 are required to pay interest and rent.

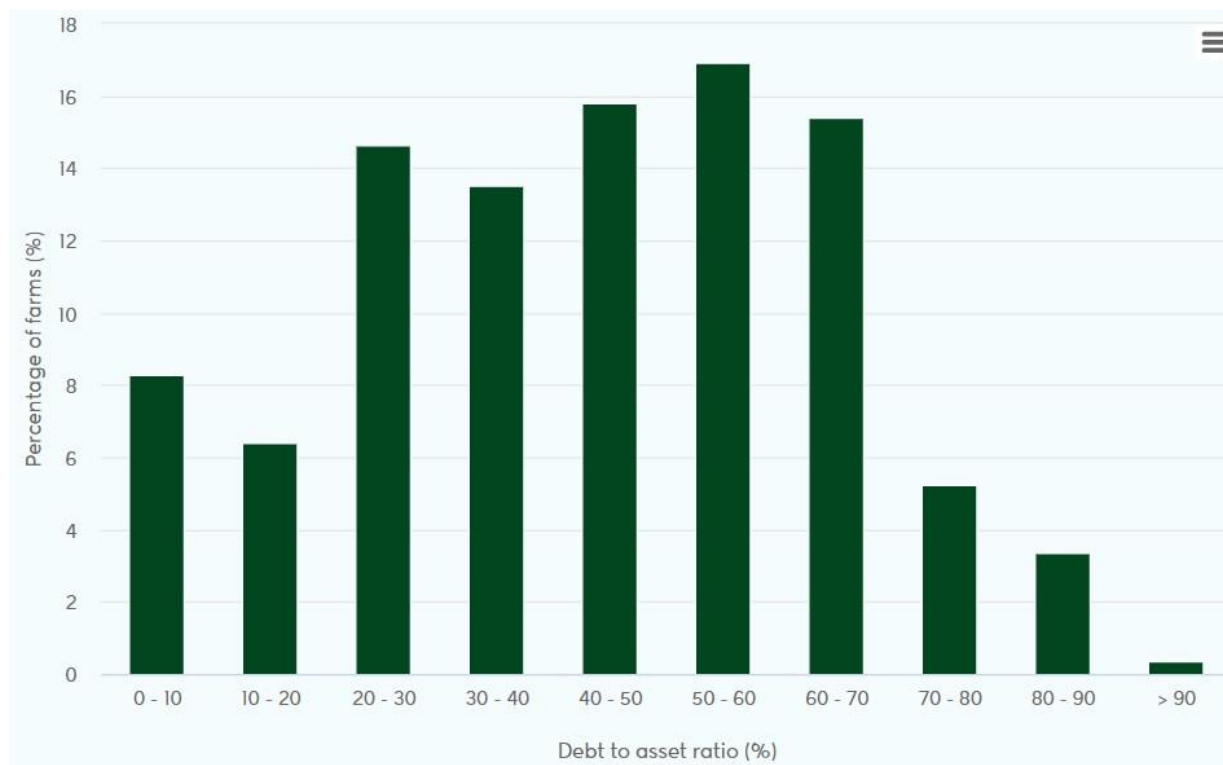
Table 6.2: Debt Servicing Ratios

Variable	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Interest & rent \$/kg MS	1.29	1.36	1.36	1.35	1.31	1.24	1.12	0.92	0.95	1.36
Interest & rent % GFR	15.6	21.5	30.5	21.2	18.2	17.7	14.7	11.6	9.7	14.7
Term liabilities \$/kg MS	20.14	21.26	22.49	25.00	25.31	24.92	23.25	22.37	23.56	22.22

Compared to the 2021-22 season, debt to asset ratio decreased by 3 percentage points in 2022-23, to 44.4 percent (Table 12.6). Debt to asset ratio decreased for the fourth season in a row, from the peak of 53.4 percent in 2018-19 (Table 12.6). The debt to asset ratio in 2022-23 is the second lowest of the last ten seasons, just above that of the 2013-14 season (\$41.9).

Graph 6.1 shows the debt to asset ratio distribution in 2022-23. More than eight percent of farms had a debt to asset ratio below 10 percent, about thirty-five percent of farms had a debt to asset ratio between 10 and 40 percent. Nine percent of the farms had a debt to asset ratio over 70 percent, with 0.4 percent sitting in the high-risk area of over 90 percent.

Graph 6.1: Debt to Asset Distribution



Over the last ten years, the average farm has increased its milksolids production by 12 percent, while total liabilities have increased by about 25 percent, from \$3.2 million to \$4.0 million per farm. Compared to the previous season, farmers decreased their term liabilities in 2022-23 by 7 percent (Table 12.6)

6.4. Liquidity

Given the reduction in net dairy cash income, a cash operating surplus of \$593,495 was recorded in 2022-23, \$178,194 lower compared to the previous season. Table 6.3 shows a breakdown of the changes in working capital, including the source and application of cash funds. The main contributor to total source of funds in 2022-23 was the cash operating surplus from the current season's farming operation (Table 6.3). The change in working capital increased to \$300,828 in 2022-23, \$35,354 more than the previous season. This is mainly associated to the reduction in current liabilities (-\$16,836).

Of the total cash available (total source of funds), 37 percent was spent on interest in 2022-23 (Table 6.3). Net capital transactions (development and purchases) were the second large cash expenditure area in 2022-23 (24 percent). Drawings from the dairy business for farm family living represented 20 percent of cash expenditure, while tax payments (17 percent) and rent (2 percent) make up the remainder of the cash spent.

Table 6.3: Flow of funds

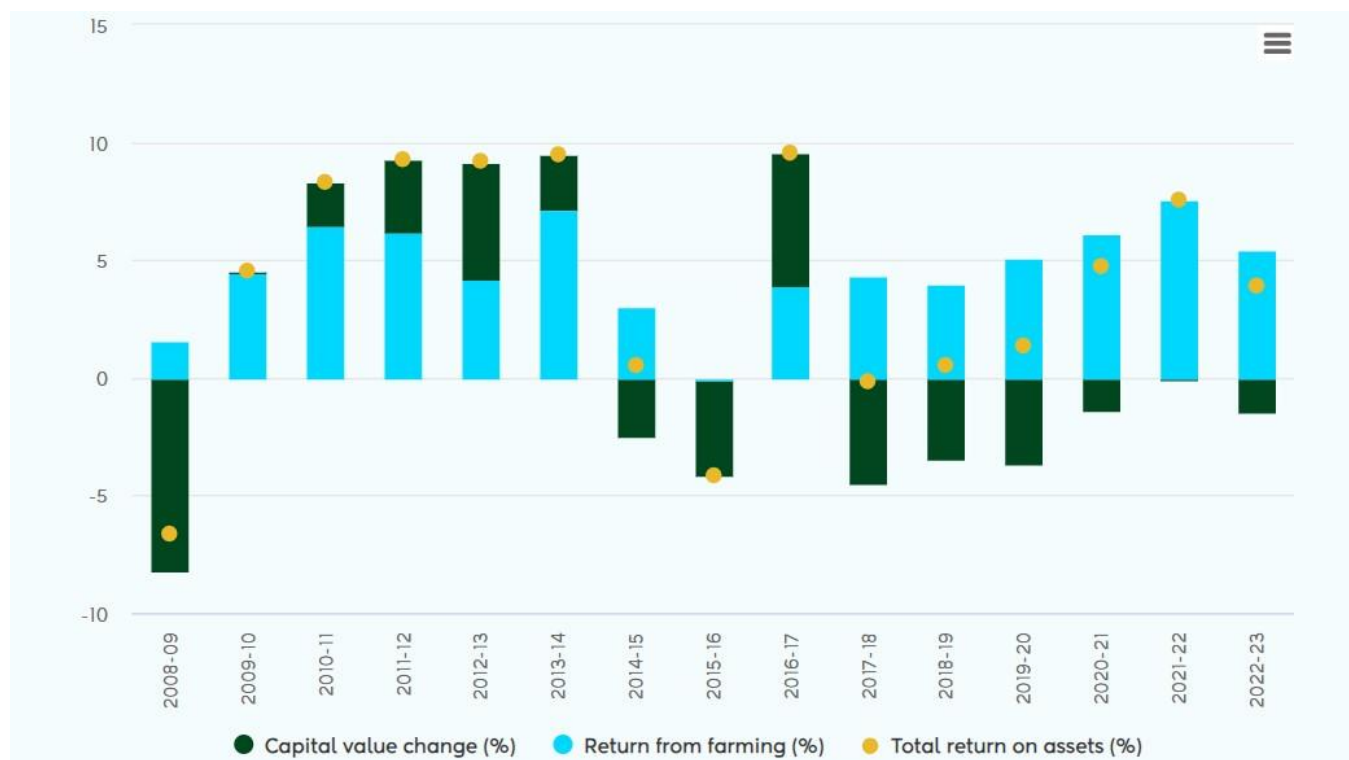
Variable	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
WORKING CAPITAL:										
Change in current assets	58,063	-99,057	-24,651	56,493	-12,326	-17,418	205,720	241,278	309,682	264,225
Less change in current liabilities	24,417	-20,779	-2,678	-9,780	29,949	-5,362	-7,441	5,350	44,208	-8,670
Change in working capital	33,646	-78,278	-21,973	66,273	-42,275	-12,056	213,162	235,928	265,474	272,895
WORKING CAPITAL:										
Cash operating surplus	572,586	361,272	141,757	415,410	478,511	446,701	537,460	601,492	771,689	574,333
Plus change in working capital	33,646	-78,278	-21,973	66,273	-42,275	-12,056	213,162	235,928	265,474	272,895
Plus net non-dairy cash income	2,355	486	904	3,371	6,064	7,040	10,682	3,378	7,614	14,755
Plus net off-farm income	9,991	12,078	9,238	19,811	18,114	6,670	13,167	9,838	-199	32,495
Plus introduced funds	-44,275	28,307	77,696	-24,004	-40,908	-2,774	-18,560	-16,833	-60,186	14,703
Plus income equalisation	-4,756	-9,579	16,765	1,307	40	307	-475	875	-1,643	717
Plus increase in term debt	10,790	93,026	111,778	75,868	92,523	74,554	-49,483	-59,719	-43,029	38,532
Total source of funds	580,337	407,312	336,165	558,036	512,069	520,442	705,952	774,958	939,721	948,430
APPLICATION OF FUNDS:										
Rent (excluding support block)	23,366	22,250	20,047	19,582	20,703	12,499	17,280	17,069	14,929	19,996
Plus interest	171,597	195,984	197,277	197,343	191,459	194,022	172,460	140,608	149,895	205,012
Plus tax	58,155	34,078	7,939	16,773	41,532	38,315	52,696	77,161	124,502	93,434
Plus net capital transactions	143,703	201,119	76,697	109,749	238,591	207,027	113,522	148,238	267,306	218,197
Plus drawings	116,224	110,437	78,151	82,043	104,334	95,173	92,090	106,679	114,873	111,668
Total application of funds	513,045	563,868	380,111	425,490	596,619	547,036	448,048	489,756	671,505	648,307
Total source of funds less application of funds	67,292	-156,556	-43,946	132,546	-84,550	-26,593	257,903	285,202	268,215	300,123

6.5. Returns

The return on dairy assets is discussed under farm profitability (Section 5.4). The total return on assets considers operating profit from both dairy and non-dairy farming operations, plus the change in the value of capital assets. The total return on assets in 2022-23 was 3.9 percent, 3.6 percentage points lower than the previous season. The 2022-23 total return on assets comprised 5.4 percent net return from all farming operations and -1.5 percent net return from capital (Graph 6.2).

For the past decade, the percentage of total return on assets has ranged between -4.1 and 9.6 percent, driven by changes in the value of land and buildings, dairy company share values, livestock values and profits (Table 12.6 and Table 12.7).

Graph 6.2: Owner Operator Total Return on Assets



The percentage return on equity is the return on the owner's funds, including capital changes after interest is paid (Table 12.7). The return on equity will be higher than the total return on assets when the latter is greater than the cost of debt and vice versa. In 2022-23 the total return on equity (3.5 percent) was lower than the total return on assets (3.9%), and 8 percentage points lower than in 2021-22.

7. Owner Operator: Regional and Systems Financial Analysis

7.1. Regional Profitability

DairyBase® classifies farms into eight regions, five in the North Island and three in the South Island (refer to Section 2.6). The values reported in Table 7.1 and 7.2 are median values to reduce numerical bias created by the average of sums methodology in regional samples. Thus, totals and sub-totals in these tables will not add up but will better represent the average values of the data sample. See section 2.11 for an explanation of this methodology.

Table 7.1 shows the values of key performance indicators (KPI) per kilogram of milksolids in the eight regions, for the 2022-23 season. Dairy farms in the Taranaki region had the smallest herd size (260 cows), followed by Northland (290). The Canterbury and Otago-Southland regions had the largest herd sizes in New Zealand, with 718 cows and 610 cows, respectively.

The West Coast - Top of the South, Northland and Lower North Island regions had the lowest stocking rates in the country, with 2.4, 2.4 and 2.5 cows/ha, respectively. Canterbury had the highest stocking rate (3.4 cows/ha), and the remaining regions had a stocking rate that varied between 2.8 and 2.9 cows/ha.

Northland recorded the lowest average milksolids production per cow of all the regions (349 kg MS). The other four North Island regions recorded milksolids per cow between 387 and 416 kg MS (Table 7.1). The Otago-Southland region had the highest milksolids production per cow (466 kilograms) in the South Island and the rest of the country. However, Canterbury production is considerably higher on a per hectare basis (1,474 kilograms) due to its higher stocking rate.

The average payout received in each region varied between \$8.52 and \$8.71 per kilogram of milksolids sold. Regional average farm working expenses (FWE) per kilogram of milksolids were lowest in Taranaki (\$5.08), and the highest FWE per kilogram of milksolids was reported in Northland and Canterbury (\$5.69 each). Canterbury (\$4,495), Taranaki (\$3,354), and Otago-Southland (\$3,353) recorded the highest operating profit on a per hectare basis, while the West Coast - Top of the South region recorded the lowest operating profit per hectare (\$1,587). Farms in the Taranaki and Canterbury regions experienced higher levels of profitability in 2022-23 relative to other regions in terms of dairy operating profit per kilogram of milksolids (Table 7.1).

Table 7.1: Regional Owner-operator Profitability (\$/kg MS) 2022/23

Variable	Northland	Waikato	Bay of Plenty	Taranaki	Lower North Island	West Coast - Top of the South	Canterbury	Otago - Southland
PHYSICAL CHARACTERISTICS								
Number of herds	27	77	23	49	24	25	20	21
Effective hectares	123	107	130	100	126	138	213	213
Peak cows milked	290	308	383	260	328	325	718	610
Stocking rate (cows/ha)	2.4	2.9	2.9	2.8	2.5	2.4	3.4	2.8
Kg milksolids sold	94,216	135,375	148,933	107,195	137,196	112,000	302,578	257,066
Milksolids sold per hectare	785	1,207	1,135	1,111	974	853	1,474	1,227
Milksolids sold per cow	349	416	398	408	387	382	436	466
PAYOUT RECEIVED (\$/kg MS sold)	8.63	8.61	8.64	8.64	8.62	8.71	8.68	8.52
DAIRY CASH INCOME (\$/kg MS):								
Milk sales (net of dairy levies)	8.63	8.61	8.64	8.64	8.62	8.71	8.68	8.52
Net livestock sales (sales - purchases)	0.82	0.49	0.54	0.48	0.64	0.46	0.44	0.41
Other dairy cash income	0.09	0.01	0.02	0.01	0.02	0.01	0.01	0.01
Net dairy cash income	9.73	9.21	9.18	9.20	9.31	9.23	9.06	9.08
CASH FARM WORKING EXPENSES (\$/kg MS):								
Wages	0.79	0.75	0.57	0.49	0.86	0.58	0.91	0.70
Animal health	0.29	0.29	0.35	0.27	0.32	0.29	0.26	0.28
Breeding & herd improvement	0.19	0.17	0.16	0.17	0.20	0.16	0.19	0.17
Farm dairy	0.06	0.08	0.06	0.09	0.07	0.09	0.05	0.07
Electricity	0.15	0.13	0.13	0.12	0.17	0.11	0.07	0.11
Net feed made, purchased, cropped	1.50	1.77	1.38	1.46	1.38	1.19	0.92	1.44
Stock grazing	0.15	0.36	0.33	0.30	0.14	0.00	1.16	0.47
Support block lease	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fertiliser (including Nitrogen)	0.71	0.57	0.66	0.63	0.54	1.20	0.54	0.78
Irrigation	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.00
Regrassing	0.13	0.07	0.06	0.03	0.07	0.05	0.08	0.05
Weed & pest	0.04	0.03	0.03	0.04	0.04	0.04	0.01	0.03
Vehicles & fuel	0.39	0.27	0.28	0.25	0.32	0.31	0.18	0.24
Repairs & maintenance	0.60	0.45	0.52	0.48	0.51	0.48	0.38	0.41
Freight & general	0.08	0.08	0.11	0.09	0.09	0.10	0.06	0.08
Administration	0.16	0.15	0.15	0.16	0.17	0.15	0.16	0.13
Insurance	0.14	0.10	0.10	0.13	0.12	0.16	0.09	0.09
ACC	0.04	0.03	0.03	0.02	0.04	0.03	0.02	0.02
Rates	0.12	0.12	0.13	0.10	0.15	0.09	0.05	0.09
Farm working expenses	5.69	5.68	5.62	5.08	5.55	5.69	5.63	5.59
Cash operating surplus	3.77	3.38	3.50	3.98	3.84	3.38	3.53	3.57
ADJUSTMENTS (\$/kg MS):								
Value of change in dairy livestock	-0.17	-0.03	-0.02	0.01	-0.05	-0.04	0.01	-0.04
Less labour adjustment	0.79	0.57	0.72	0.76	0.62	0.69	0.16	0.37
Plus feed inventory adjustment	0.00	0.08	0.05	0.00	0.02	0.00	0.00	0.12
Less owned support block adjustment	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.15
Less depreciation	0.46	0.39	0.36	0.40	0.39	0.54	0.41	0.34
Net Adjustments	-1.62	-1.03	-1.26	-1.24	-1.39	-1.38	-0.57	-0.79

OPERATING CASH & NON-CASH (\$/kg MS):								
Dairy gross farm revenue	9.58	9.16	9.12	9.15	9.31	9.18	9.15	9.17
Dairy operating expenses	7.37	6.66	6.39	6.33	6.97	7.48	6.24	6.68
Dairy operating profit	2.38	2.59	2.55	2.78	2.34	2.05	3.10	2.51
OPERATING CASH & NON-CASH (\$/ha):								
Dairy gross farm revenue	7,646	10,832	10,319	10,436	8,756	8,092	13,534	11,570
Dairy operating expenses	5,775	7,598	7,322	7,119	6,645	6,370	9,302	8,337
Dairy operating profit	1,655	3,045	2,731	3,354	2,139	1,587	4,495	3,353
Operating profit margin (%)	24.1	27.5	26.0	30.1	24.5	21.2	32.8	27.1

Table 7.2 shows the values for the key indicators of financial position for the eight regions in 2022-23. The values reported in this table are medians; see section 2.11 for an explanation of this methodology. Regional median for operating returns on dairy assets ranged between 4.2 and 6.6 percent. Canterbury (6.6%) and Otago - Southland (6.4%) had the highest operating return on dairy assets in 2022-23. Northland had the lowest operating returns on dairy assets (4.2%). In the case of total return on assets, Northland (11.0%) and West Coast - Top of the South (10.7%) recorded the highest values, while Waikato recorded the lowest (1.7%).

Total return on equity is the return on the owner's funds, including capital changes after interest is paid. All regions had a positive percentage of total return on equity, except for Waikato, which was -0.3 percent (Table 7.2). The regional median for equity growth was negative for Waikato (-2.1 percent) and Canterbury (-1.8 percent), but positive in the other regions. Northland and West Coast - Top of the South had the largest growth in equity (15.9% and 17.8%, respectively).

Average term liabilities per kilogram of milksolids in 2022-23 varied significantly between regions. The range in term liabilities was \$15.62 to \$28.37 per kilogram of milksolids. Taranaki was the region with the highest term liabilities per kilogram of milksolids (\$28.37) while West Coast - Top of the South was the lowest (\$15.62/kg MS). Debt to asset levels also varied significantly between regions. Bay of Plenty and Northland had the lowest values (40.0 and 40.4 percent, respectively), while Taranaki had the highest (54.5%).

Table 7.2: Regional Owner-operator Financial Position 2022/23

Variable	Northland	Waikato	Bay of Plenty	Taranaki	Lower North Island	West Coast - Top of the South	Canterbury	Otago - Southland
RETURNS:								
Operating return on dairy assets %	4.2	4.7	5.0	4.9	4.5	5.9	6.6	6.4
Total return on assets %	11.0	1.7	5.0	4.4	7.2	10.7	3.2	4.2
Total return on equity %	15.9	-0.3	4.5	4.0	7.9	17.8	2.5	4.0
Growth in equity %	14.7	-2.1	5.5	2.5	6.0	18.3	-1.8	1.3
DEBT:								
Closing term liabilities (\$/kg MS sold)	22.23	24.31	19.49	28.37	24.44	15.62	20.08	19.52
Closing debt to asset %	40.4	46.3	40.0	54.5	43.0	43.3	47.4	48.7

7.2. Production Systems

DairyBase® categorises farms into five production systems based on the quantity of feed purchased (including off-farm grazing) and the timing and use of imported feed (refer to Section 2.7 for production system descriptions). For the following analysis, the systems have been combined to produce three categories: low (systems 1 and 2), medium (system 3) and high (systems 4 and 5). Within each production system, there is variation in milksolids production and profitability. The production system type is not a good indicator of profitability as a farm can be profitable (or unprofitable) operating at any system. Profit is less to do with the production system type and more to do with the management, milksolids production and the costs within the production system.

The averages reported in Table 7.3 and 7.4 are median values to reduce numerical bias created by the average of sums methodology in regional samples. Thus, totals and sub-totals in these tables will not add up but will better represent average values in the data sample. See section 2.11 for an explanation of this methodology.

Table 7.3 shows the key 2022-23 average performance indicators per kilogram of milksolids in the three production system categories. Average stocking rates increase from low to high production systems. Average milksolids per cow and per hectare also follow this trend, reflecting higher inputs of supplementary feed. On average low system farms recorded 372 kg MS per cow, medium system farms recorded an average of 400 kg MS per cow while high input farms recorded an average of 444 kg MS per cow. The average milksolids production per hectare in medium input farms (1,090 kg) was 87 kilograms higher than in low input farms (1,003 kg) and 272 kilograms lower than in high input farms (1,275 kg).

Dairy cash income per kilogram of milksolids was highest for high input systems (\$9.25) due to milk sales being greater than the other two systems. Low input (\$9.20) and medium input systems (\$9.23) had similar average dairy cash incomes per kilogram of milksolids. Farm working expenses per kilogram of milksolids were \$5.05 for low input systems, \$5.50 for medium input systems and \$6.09 for high input systems.

Cash operating surplus per kilogram of milksolids was the highest for low input systems (\$4.15), followed by medium input systems (\$3.71). High input systems recorded the lowest average cash operating surplus of \$3.23 per kilogram of milksolids. Operating profit per kilogram of milksolids was highest for medium input systems (\$2.72), and lowest for high input systems (\$2.20). Low input systems had an operating profit per kilogram of milksolids of \$2.69, which was close to that of medium input systems. Operating profit per hectare was highest for medium input systems (\$2,972), \$277 higher than high input systems (\$2,6895) and \$523 higher than low input systems (\$2,449).

Table 7.3: Owner-operator Production Systems Profitability (\$/kg MS)

Variable	1 & 2 (Low)	3 (Medium)	4 & 5 (High)
PHYSICAL CHARACTERISTICS			
Number of herds	64	118	84
Effective hectares	108	130	126
Peak cows milked	290	374	338
Stocking rate (cows/ha)	2.6	2.7	2.9
Kg milksolids sold	102,848	148,492	155,544
Milksolids sold per hectare	1,003	1,090	1,275
Milksolids sold per cow	372	400	444
PAYOUT RECEIVED (\$/kg MS sold)	8.62	8.63	8.68

DAIRY CASH INCOME (\$/kg MS):			
Milk sales (net of dairy levies)	8.62	8.63	8.68
Net livestock sales (sales - purchases)	0.56	0.52	0.47
Other dairy cash income	0.01	0.02	0.01
Net dairy cash income	9.20	9.23	9.25
CASH FARM WORKING EXPENSES (\$/kg MS):			
Wages	0.61	0.70	0.77
Animal health	0.29	0.29	0.31
Breeding & herd improvement	0.19	0.16	0.18
Farm dairy	0.07	0.07	0.07
Electricity	0.13	0.13	0.13
Net feed made, purchased, cropped	0.97	1.39	1.88
Stock grazing	0.21	0.36	0.33
Support block lease	0.00	0.00	0.00
Fertiliser (including Nitrogen)	0.74	0.64	0.62
Irrigation	0.00	0.00	0.00
Regrassing	0.06	0.07	0.06
Weed & pest	0.03	0.03	0.04
Vehicles & fuel	0.30	0.26	0.27
Repairs & maintenance	0.49	0.48	0.46
Freight & general	0.09	0.08	0.09
Administration	0.16	0.14	0.16
Insurance	0.13	0.11	0.11
ACC	0.03	0.04	0.03
Rates	0.15	0.11	0.10
Farm working expenses	5.04	5.50	6.09
Cash operating surplus	4.15	3.71	3.23
ADJUSTMENTS (\$/kg MS):			
Value of change in dairy livestock	-0.04	-0.03	-0.03
Less labour adjustment	0.93	0.58	0.55
Plus feed inventory adjustment	0.02	0.02	0.00
Less owned support block adjustment	0.00	0.00	0.00
Less depreciation	0.43	0.39	0.42
Net Adjustments	-1.58	-1.14	-1.00
OPERATING CASH & NON-CASH (\$/kg MS):			
Dairy gross farm revenue	9.17	9.18	9.21
Dairy operating expenses	6.64	6.36	7.22
Dairy operating profit	2.69	2.72	2.20
OPERATING CASH & NON-CASH (\$/ha):			
Dairy gross farm revenue	9,361	10,122	12,003
Dairy operating expenses	6,268	7,002	9,062
Dairy operating profit	2,449	2,972	2,695
Operating profit margin (%)	28.9	29.0	24.5

Table 7.4 shows key 2022-23 average financial indicators in the three production system categories. The averages reported in this table are medians; see section 2.11 for an explanation of this methodology. The operating return on dairy assets was highest for medium input farms (5.6%) and lowest for high input farms (4.6%). Once capital and non-dairy operations were included, the average total return on assets was 5.1 percent for low input farms, 4.0 percent for medium input farms and 3.6 percent for high input farms. Low input farms had the smallest debt to asset ratio (40 percent), closely followed by medium input farms (44 percent). High input farms had a debt to asset ratio of 52 percent. Closing term liabilities per kilogram of milksolids was higher for low and medium input systems (\$22.29 and 22.28) than for high input systems (\$20.95).

All farm system types had positive median growth in equity percentages. Medium and high input systems recorded an average growth in equity of 1.9 and 0.7 percent, respectively. Average growth in equity for low input systems (3.9 percent) more than doubled that of medium and high input systems (Table 7.4).

Table 7.4: Owner-operator Production Systems Financial Position 2022/23

Variable	1 & 2 (Low)	3 (Medium)	4 & 5 (High)
RETURNS:			
Operating return on dairy assets %	5.1	5.6	4.6
Total return on assets %	5.1	4.0	3.6
Total return on equity %	5.0	3.1	1.3
Growth in equity %	3.9	1.9	0.7
DEBT:			
Closing term liabilities (\$/kg MS sold)	22.29	22.28	20.95
Closing debt to asset %	39.8	43.8	52.4

8.50:50 Sharemilkers: Operational Financial Analysis

8.1. Introduction

Operating profit per hectare for 50:50 sharemilkers (herd owning sharemilkers) decreased by 37 percent to \$1,104 per hectare in 2022-23. In terms of the revenue composition the lower payout received in 2022-23 was partially offset by the increase in milksolids production per hectare (from 1,227 kg in 2021-22 to 1,239 in 2022-23). Operating expenses per kilogram of milksolids increased by 4 percent to \$3.76. The average cash available for living and growth decreased to \$181,016 per farm, a decrease of \$68,472 from 2021-22 (Table 13.5). With increased capital expenditure, drawings and debt, a cash surplus of \$5,853 per farm was recorded in 2022-23 (Table 13.5).

Tables 13.1, 13.2, 13.3 and 13.4 in Chapter 13 show net cash income, cash farm working expenses and the adjustments made to calculate operating profit for the average New Zealand 50:50 sharemilker on a per farm, per cow, per hectare and per kilogram of milksolids sold basis.

8.2. Revenue

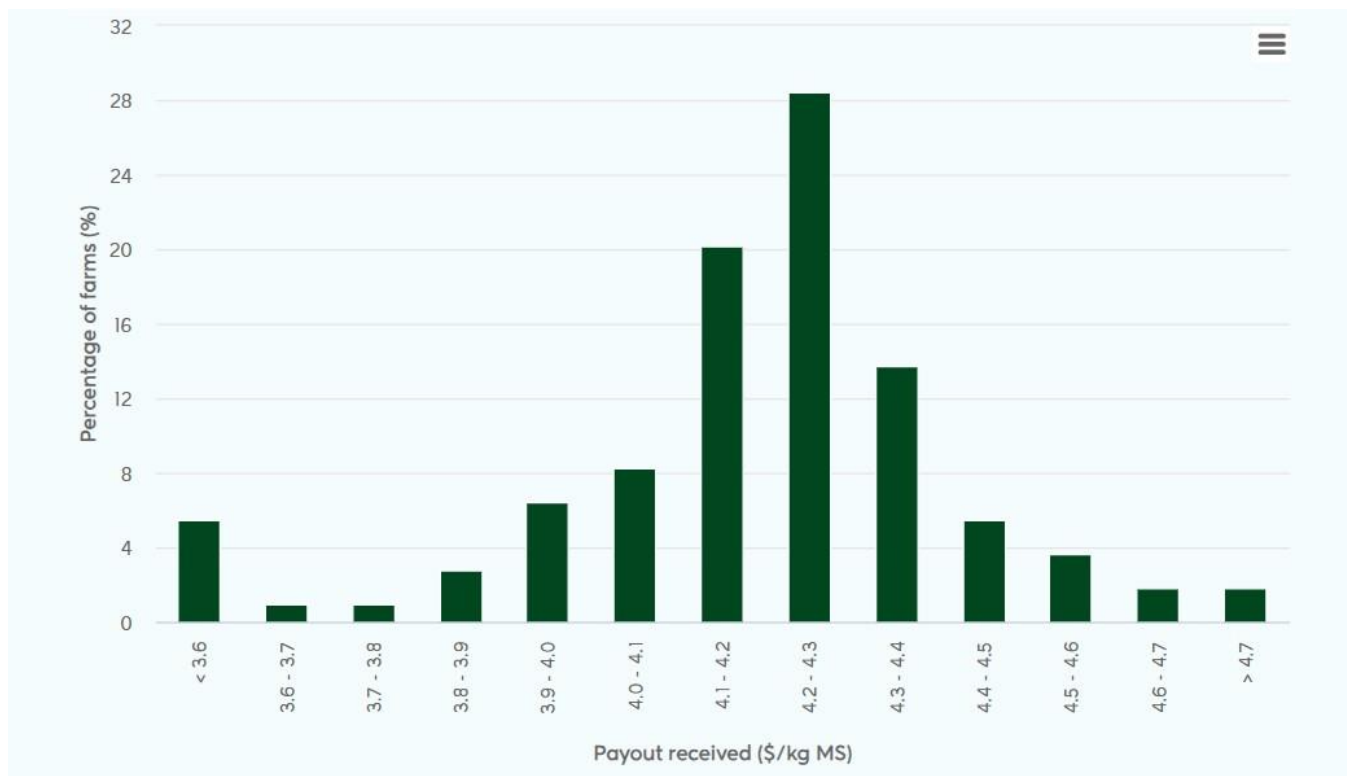
The milk payout received (including dividend payments) in 2022-23 decreased \$0.40 (9 percent) from the previous season to \$4.14 per kilogram of milksolids. Both, kilograms of milksolids sold per cow and per hectare increased from 2021-22 to 2022-23, by 10 and 12 kg MS, respectively (Table 13.5). The average milk sales (net of dairy levies) per farm of 752,157 kg was lower than in the previous season (\$778,049). Milk revenue in 2022-23 accounted for 89 percent of gross farm revenue. Livestock revenue accounted for 5.6 percent of the total gross farm revenue per farm.

Figure 8.1 shows the variation in milksolids payout received by farmers in the 2022-23 season. These differences are driven by:

- Differences in the percentage of milk payment received,
- Variations in the milk composition (fat, protein, lactose, minerals),
- Annual account balance dates,
- Milk company supplied,
- Different systems such as organics,
- Penalties incurred, and,
- Whether the sharemilker operated in the previous season.

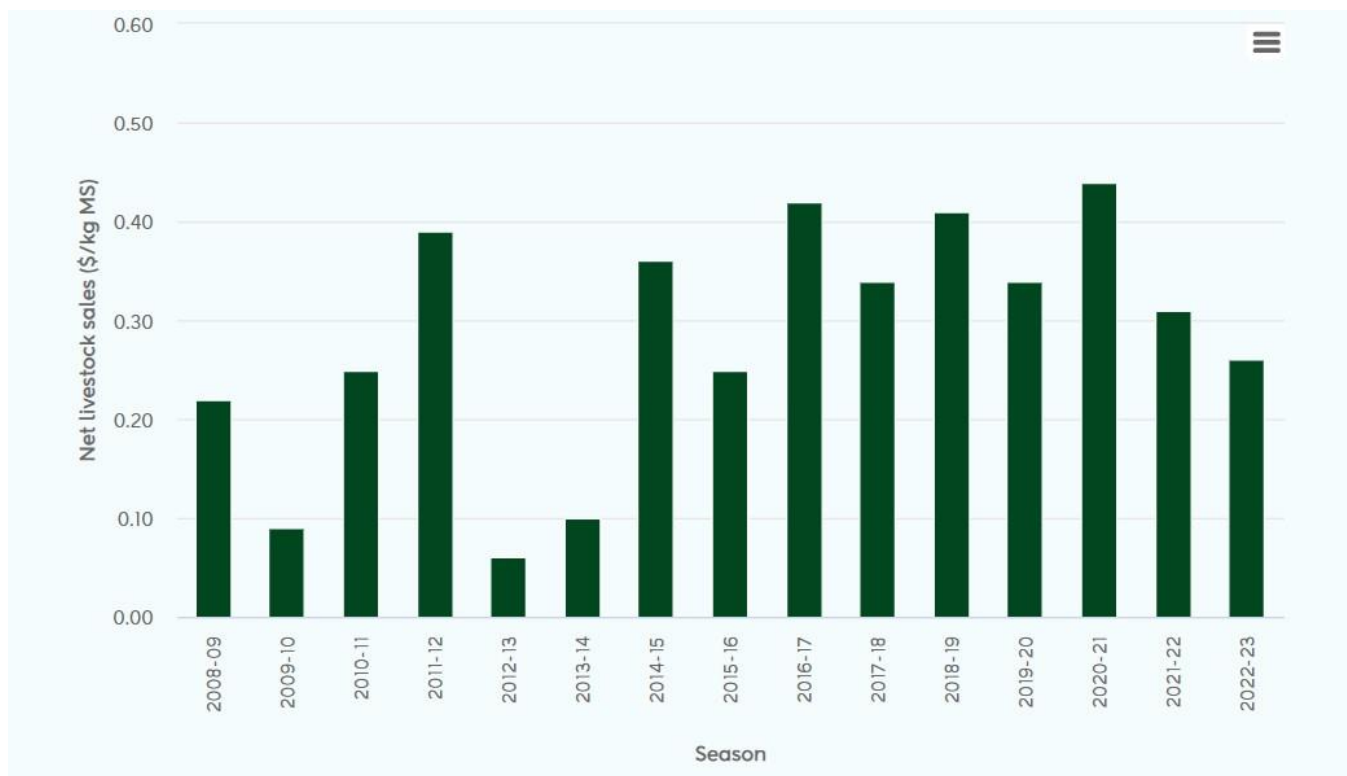
The majority (62%) of farmers in this business type received a milksolids payout between \$4.10 and \$4.40.

Graph 8.1: Distribution of Milk Payout Received



Cash income from net livestock sales decreased by \$0.05 to \$0.26 per kilogram of milksolids in 2022-23 (Figure 8.2). Net livestock sales per cow decreased by \$17 to \$108, the lowest from the last 6 seasons.

Graph 8.2: Net Livestock Sales (\$/kg MS)



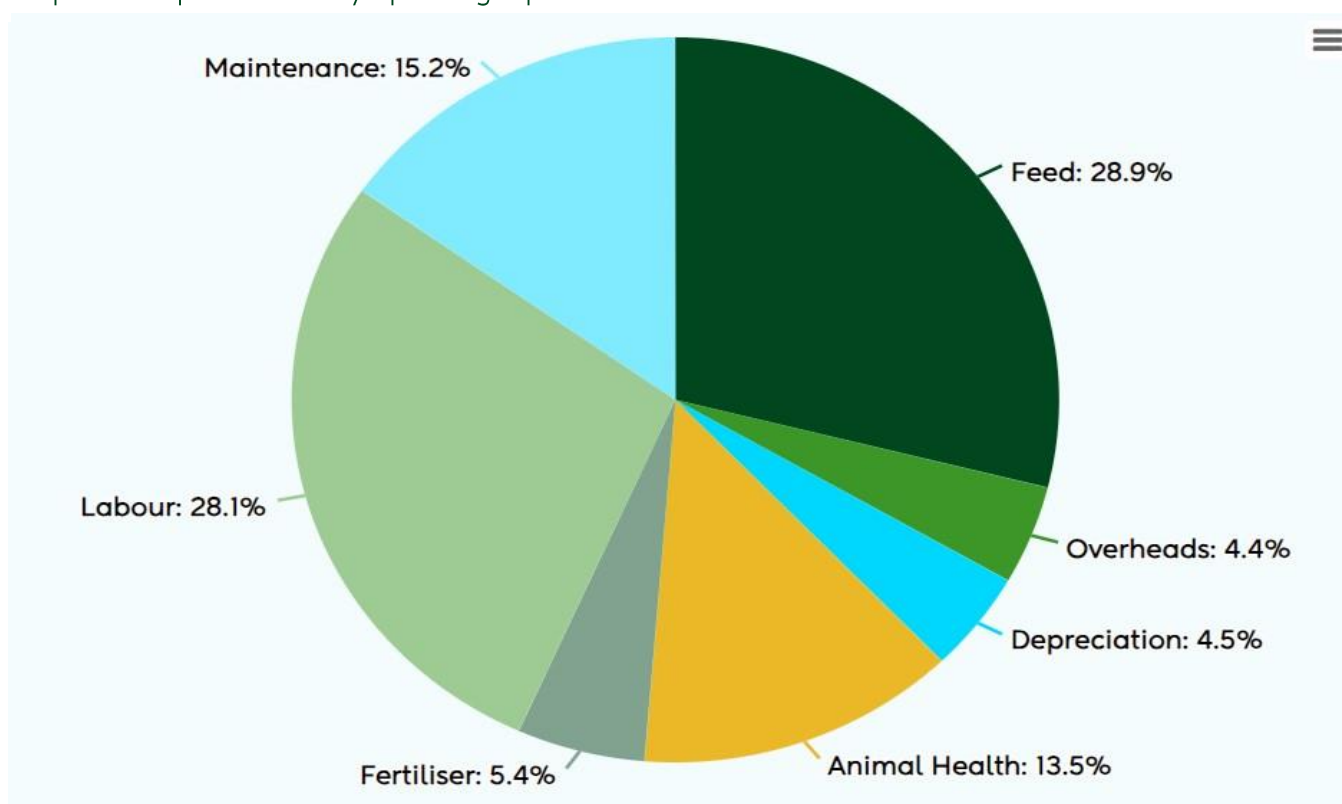
Dairy gross farm revenue for a typical New Zealand sharemilker was \$844,762 and was larger than the previous season by 2 percent (\$865,070 in 2020-21). On a per hectare basis, gross farm revenue of \$5,763 was lower (+7 percent) in 2022-23 compared to 2021-22.

Tables 13.1, 13.2, 13.3 and 13.4 show net cash income, cash farm working expenses and the adjustments made to calculate operating profit for the average New Zealand owner-operator on a per farm, per cow, per hectare and per kilogram of milksolids sold basis, respectively.

8.3. Expenditure

Feed and labour were the largest expenditure category 2022-23 (28.9 and 28.1 percent, respectively). Maintenance and animal health contributed 15.2 and 13.5 percent, respectively. Figure 8.3 shows the major 2021-22 expenditure categories for sharemilkers.

Graph 8.3: Proportion of Dairy Operating Expenditure



Changes in total farm expenditure for sharemilkers are primarily affected by the herd size and milksolids produced, since sharemilkers primarily pay animal related costs. Compared to the previous season, farm working expenses (FWE) per farm increased by 13 percent to \$554,471. On a per kilogram of milksolids basis, FWE increased \$0.19 to \$3.05. After non-cash adjustments, operating expenses per kilogram of milksolids were \$0.15 higher (\$3.76) in 2022-23.

Table 8.1 shows the historical distribution (%) of dairy expenses in the last 10 seasons. Historically, labour expenses represented the highest proportion of operating expenses for 50:50 sharemilkers, but the proportion (%) of feed expenditure in the 2022-23 season (29%) was higher than labour expenses. This can be associated to the high feed costs and inflation during that season. The proportion of fertiliser expenses (5.4) also increased during the 2022-23 season and was the highest of the last 10 seasons.

Table 8.1: Proportion (%) of Dairy Operating Expenditure in the last 10 years.

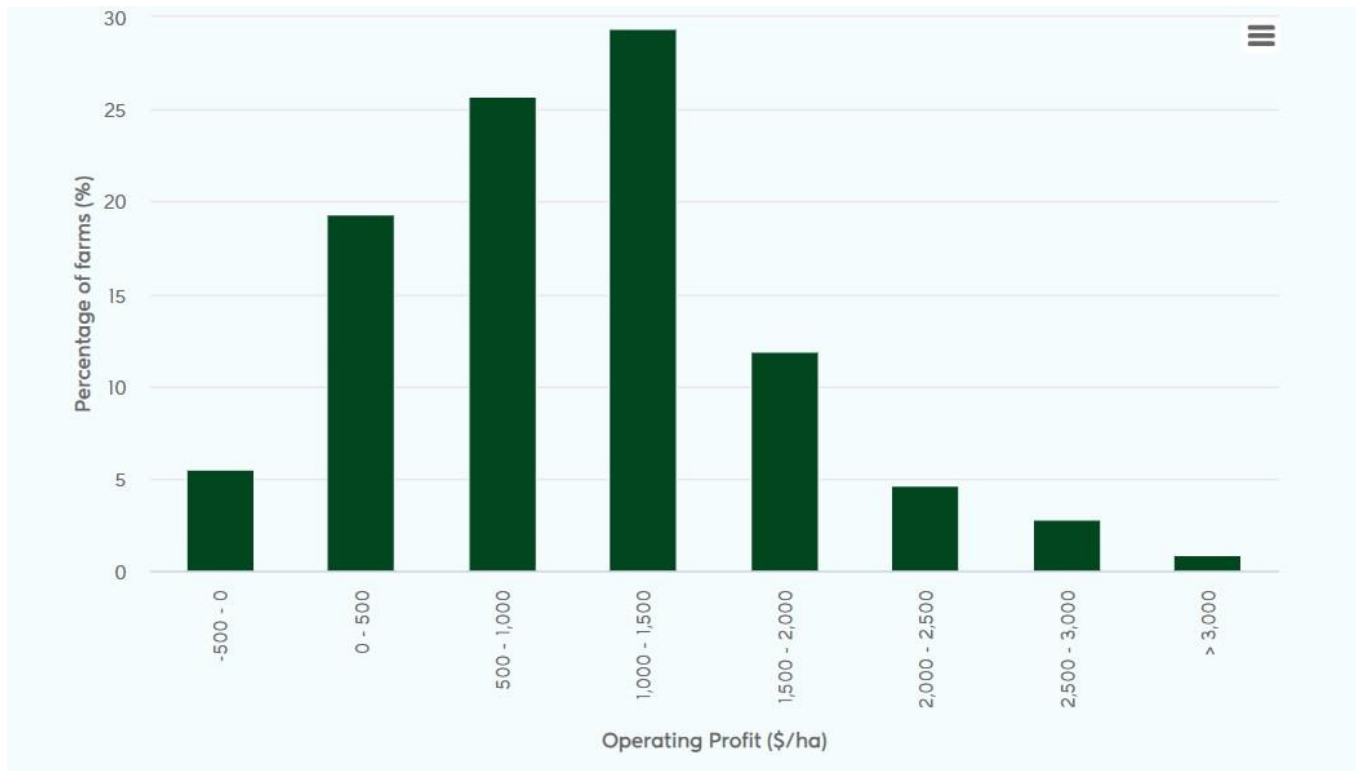
Season	Animal health expenditure (%)	Depreciation expenditure (%)	Feed expenditure (%)	Fertiliser expenditure (%)	Labour expenditure (%)	Maintenance expenditure (%)	Overheads expenditure (%)
2013-14	13.8	5.2	26.3	5	28	17.1	4.6
2014-15	13.7	5.7	26.2	4.6	29.2	15.7	4.9
2015-16	13.2	5.9	23.9	4.8	31.1	16.1	5
2016-17	14.1	5	22.5	4.9	31.2	17.4	4.9
2017-18	13.8	5.4	25	4.5	30.8	16	4.5
2018-19	14.4	4.8	26.7	4.7	29.1	15.6	4.7
2019-20	14.1	4.9	26.8	5.1	29	15.7	4.4
2020-21	14.2	5.1	25.6	4.4	30.4	15.8	4.5
2021-22	14.2	4.5	27.8	4.8	29.3	15.1	4.3
2022-23	13.5	4.5	28.9	5.4	28.1	15.2	4.4

8.4. Profitability

Operating profit is a key indicator of dairy farm financial performance. This measure, expressed on a per hectare basis, is useful for comparing the profitability between farms. Operating profit incorporates adjustments to allow comparisons between farms but does not include interest, tax or rent payments. Tables 13.1, 13.2, 13.3 and 13.1 show the revenue and expenditure items included in operating profit. On average, operating profit per hectare in the 2022-23 season (\$4,659) was the highest of the last 10 seasons.

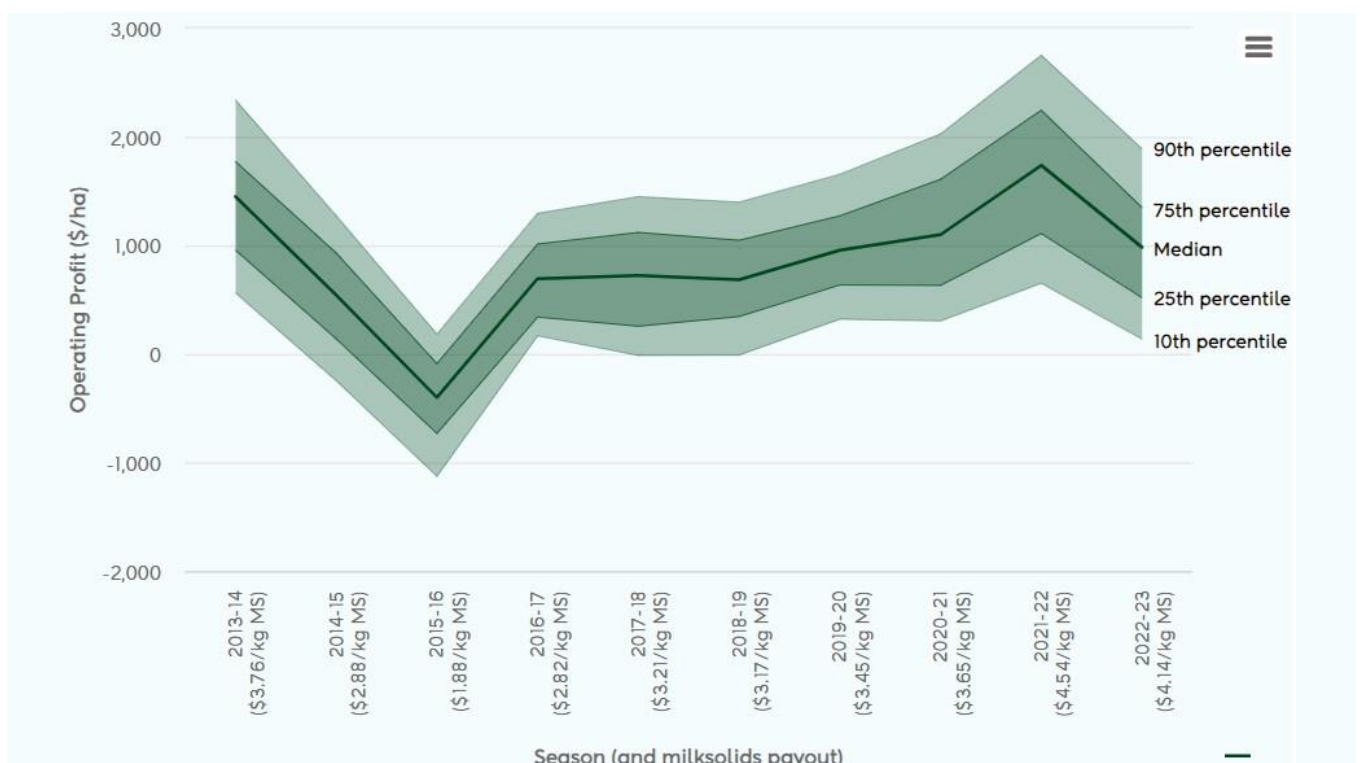
Graph 8.4 shows the distribution of operating profit per hectare in the 2022-23 season. Fifty-five percent of 50:50 sharemilkers had operating profits between \$1,000 and \$1,500 per hectare, while 0.9 percent of farmers had operating profits over \$3,000 per hectare. About 5.5 percent of farms recorded a negative operating profit in 2022-23 (Graph 8.4).

Graph 8.4: Distribution of Operating Profit (\$/hectare)



Graph 8.5 shows the distribution of operating profit (\$/ha) in the last ten seasons. As for owner-operators, the distribution of operating profit for 50:50 sharemilkers has noticeable shifts across seasons, and it is clearly influenced by the milksolids payout received. In 2022-23, the range in operating profit (\$/ha) was smaller than in the previous season, with 50% of farms (between the 25th and 75th percentile) having an operating profit per hectare spanning \$773 (between \$578 and \$1,348). Ten percent of farms had an operating profit per hectare below \$136.

Graph 8.5: Distribution of operating profit (\$/ha) in the last 10 seasons



Operating return on dairy assets measures the operating profit generated by the dairy assets employed at the start of the season. This measure excludes non-dairy activities and any change in capital value. Operating returns on dairy assets for sharemilkers are more volatile than owner-operators because sharemilkers' dairy assets primarily consist of livestock. The average operating return on dairy assets for sharemilkers increased to 15.9 percent in 2022-23. Figure 8.6 shows the distribution of operating return on dairy assets by production systems. Grouping farm production systems into low (systems 1 and 2), medium (system 3), and high input (systems 4 and 5) show that the median operating return on dairy assets was similar for medium and high input farms (13.9 percent) but higher for low input systems (16.9 percent).

Graph 8.6: Return on Dairy Assets Distribution



Business profit before tax is another measure of profitability that considers the cost of borrowing and other non-dairy activities, measuring the overall profitability of the business enterprise and not just the dairy farm operation (Table 8.2).

Table 8.2: 2022/23 Business Profit before Tax

BUSINESS PROFIT (\$):	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Dairy operating profit	182,709	65,599	-53,678	91,877	98,570	117,177	151,293	180,220	246,175	161,879
Plus labour adjustment	68,733	77,508	73,553	72,041	80,608	80,071	82,559	91,240	100,776	102,774
Plus owned support block adjustment	685	1,245	695	508	251	299	479	611	1,010	860
Plus net non-dairy profit	2,052	2,671	2,203	2,387	2,758	2,615	1,209	5,284	844	2,636
Plus net off-farm income	3,989	3,817	4,546	2,281	4,071	5,230	10,975	8,513	12,921	12,018
Less rent (excluding support block)	3,401	5,154	1,407	1,047	2,320	827	1,220	438	214	43
Less interest	34,599	31,805	37,949	34,629	31,626	36,976	27,516	21,389	19,725	29,384
Business profit before tax	220,149	113,971	-12,038	133,967	154,478	166,064	217,779	264,041	341,787	250,740
Business profit before tax (\$/total hectares)	1,484	755	-75	841	967	951	1,260	1,577	2,202	1,480

The average sharemilker in 2022-23 made a business profit before tax of \$250,740 per farm, down \$91,047 compared to the previous season. This business profit is equivalent to \$1,480 per all effective hectares (effective dairy + effective dairy support block + effective non-dairy). Interest paid in 2022-23 (\$29,384) was higher than in the previous three seasons due to the high Official Cash Rate associated with higher inflation, but it was still below the 10-year average of \$30,560. Rent payments were lower than in the previous nine seasons.

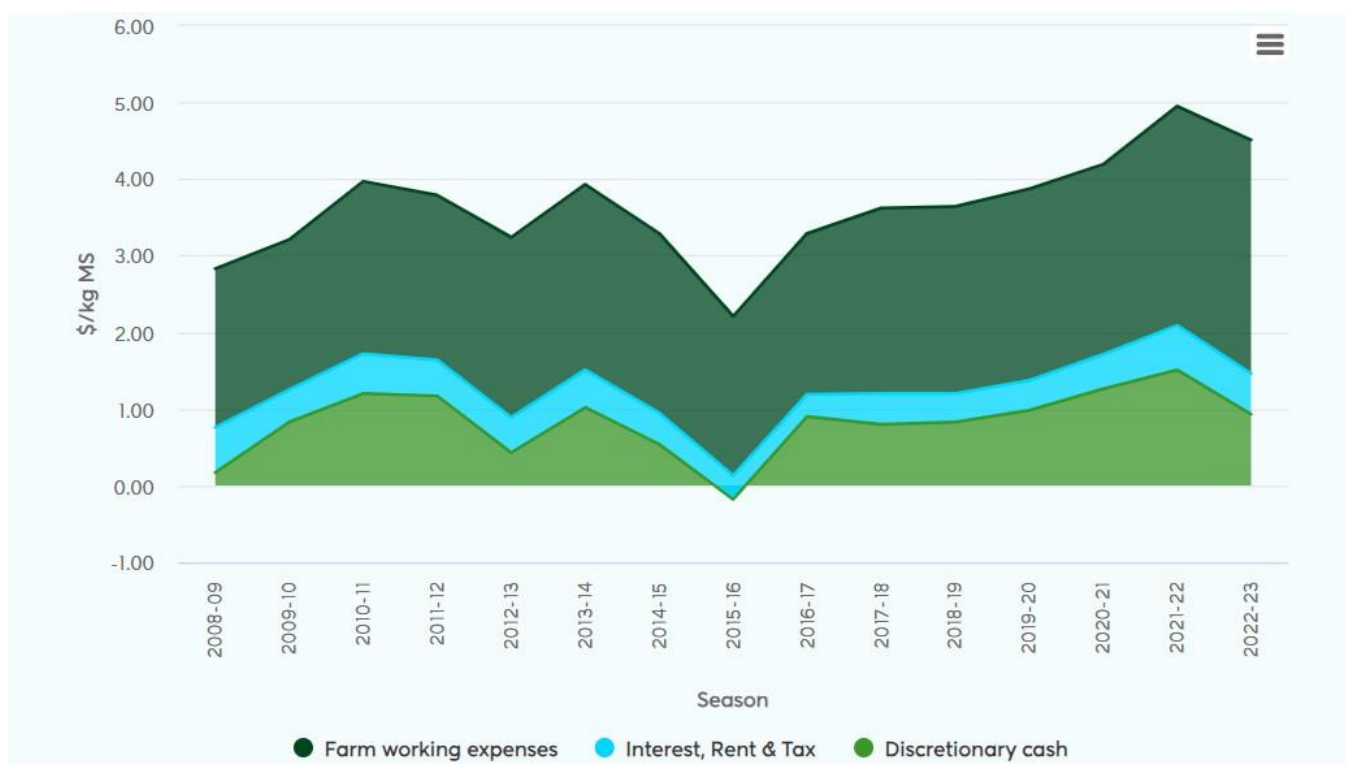
8.5. Cash Flow

The cash operating surplus is the difference between net dairy cash income and farm working expenses. In 2022-23, the average cash operating surplus of 50:50 sharemilkers (\$250,934) decreased by 27 percent compared to the previous season. On a per kilogram of milksolids basis, the \$1.38 cash operating surplus was down \$0.63 from last season. Once rent, interest and tax are paid, and net income from non-dairy farming activities and net off-farm income are added, the remaining value is discretionary cash. Total discretionary cash in 2022-23 was \$168,587, equating to \$0.93 per kilogram of milksolids (Table 13.5).

Many farm businesses include cash funds and off-farm income in their annual accounts. The cash available after including these activities and any change of funds deposited or withdrawn from the IRD Income Equalisation Scheme is the cash available for living and growth, which can be used for drawings, debt repayments and/or capital development and purchases. Cash available for living and business growth in 2022-23 was \$181,016 per farm, down 27 percent from last season (Table 13.5).

In 2022-23, on a per kilogram of milksolids basis, net dairy cash income (\$4.51) was higher than in the previous season (\$4.95). After farm working expenses (\$3.05) and interest, rent & tax (\$0.53) were deducted, a discretionary cash of \$0.93 was left per kilogram of milksolids in 2022-23 (Graph 8.7). Discretionary cash per kilogram of milksolids in the 2022-23 season was lower than the previous season, but higher than the 10-year average of (\$0.86).

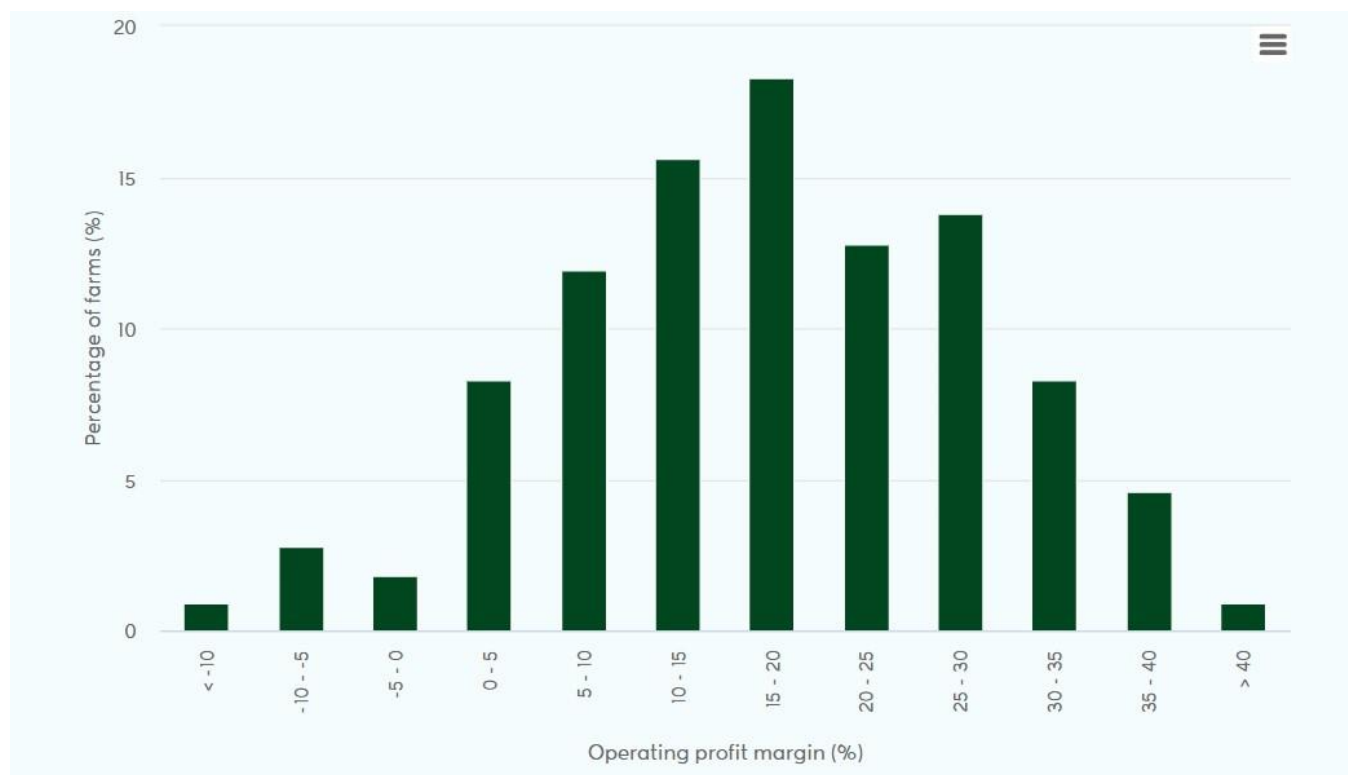
Graph 8.7: Annual Change in Revenue and Expenditure Over 10 Years (\$/kg MS)



8.6. Operating Profit Margin

Operating profit margin is an indicator of dairy farm financial performance. This measurement is expressed as a percentage and describes the proportion of gross farm revenue converted to profit. The ability of a farmer to convert a high proportion of their revenue to profit indicates that the farm is cost-efficient and better placed to deal with financial and production risks. Graph 8.8 shows the distribution of operating profit margins in the 2022-23 season. Seventy-two percent of 50:50 sharemilkers had an operating profit margin between 5 percent and 30 percent (Graph 8.8).

Graph 8.8: Distribution of Operating Profit Margins (%)



9.50:50 Sharemilkers: Equity and Capital Financial Analysis

9.1. Introduction

This section considers dairy farms' equity and capital position, with additional information about trends over time in these positions.

The average dairy operating profit per hectare of 50:50 sharemilkers in 2022-23 decreased by \$660, to \$1,104. Cash operating surplus per farm in 2022-23 (\$250,934) was 27 percent lower than in the previous year. The average interest paid by 50:50 sharemilkers in 2022-23 (\$29,384) was higher than in the previous three seasons but rent and tax payments were lower (Table 13.5). After the addition of introduced funds and income equalisation, the discretionary cash available 2021-22 was \$168,587, 34 percent lower than in the previous season (\$258,608). The cash surplus per kilogram of milksolids in 2022-23 (\$0.03) was significantly lower than in the previous three seasons (between \$0.23 and \$0.28). Sharemilkers' equity grew by \$62,197 in 2022-23, to \$898,310, driven by growth in equity from the farming operation (\$93,657). Total liabilities as a percentage of total assets (the debt to asset ratio) marginally increased to 36.6 percent at the end of the season. Closing term liabilities per kg of milksolids decreased from \$2.67 (2021-22 season) to \$2.29 (2022-23).

9.2. Dairy Assets

Total dairy assets increased by \$10,930 during the 2022-23 season, closing at \$1,199,475 per farm (Table 13.6). Livestock constitutes the highest proportion of sharemilkers' dairy assets, comprising 68 percent of total dairy assets at closing.

9.3. Liabilities and Debt Servicing

Interest is the cash cost of borrowing funds, while rent is the cost of borrowing assets. The average interest & rent per kilogram of milksolids in 2022-23 was \$0.16, higher than in the previous two seasons, but still lower than the 10-year average of \$0.19 (Table 13.5). The average term debt decreased by (\$48,487) during the 2022-23, closing at \$416,013 per farm (Table 13.6).

The flow of funds (Table 9.1) shows the components of the change in working capital, including the source and application of cash funds. The total source of funds for 2022-23 (\$385,080) were mostly from farm operations (cash operating surplus and change in working capital). Of the funds applied, 39 percent was spent on drawings (9 percentage points higher than the previous season) and 28 percent was used for tax payments (\$66,548). Net capital transactions (\$48,159) represented 21 percent of total funds applied.

Table 9.1: Flow of Funds

Variable	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
WORKING CAPITAL:										
Change in current assets	32,816	-23,771	-16,221	22,455	2,932	-24,375	112,605	161,046	195,556	153,504
Less change in current liabilities	13,755	-1,920	23,954	-9,244	15,668	-10,322	-10,193	-16,512	21,208	-3,071
Change in working capital	19,061	-21,851	-40,175	31,699	-12,736	-14,053	122,798	177,558	174,349	156,575
WORKING CAPITAL:										
Cash operating surplus	201,958	137,419	11,433	167,540	169,323	213,273	230,372	298,298	344,252	250,934
Plus change in working capital	19,061	-21,851	-40,175	31,699	-12,736	-14,053	122,798	177,558	174,349	156,575
Plus net non-dairy cash income	2,036	2,511	2,243	1,798	1,996	2,659	-1,380	5,060	906	1,611
Plus net off-farm income	3,989	3,817	4,546	2,281	4,071	5,230	10,975	8,513	12,921	12,018
Plus introduced funds	13,155	24,197	26,601	12,583	14,806	-19,006	-10,255	27,709	-9,120	13,246
Plus income equalisation	-2,621	-6,091	5,707	1,412	0	470	0	596	0	-817
Plus increase in term debt	973	50,721	37,011	-17,644	-20,730	33,643	-8,192	-20,070	-60,025	-48,487
Total source of funds	238,551	190,723	47,366	199,669	156,730	222,216	344,318	497,664	463,283	385,080
APPLICATION OF FUNDS:										
Rent (excluding support block)	3,401	5,154	1,407	1,047	2,320	827	1,220	438	214	43
Plus interest	34,599	31,805	37,949	34,629	31,626	36,976	27,516	21,389	19,725	29,384
Plus tax	29,237	25,101	5,492	6,220	24,199	30,109	39,336	60,010	79,532	66,548
Plus net capital transactions	60,379	89,030	26,407	36,654	49,540	113,811	57,631	119,380	84,090	48,159
Plus drawings	72,813	83,335	56,461	57,721	74,517	67,169	65,458	76,247	79,739	90,535
Total application of funds	200,429	234,425	127,716	136,271	182,202	248,891	191,161	277,464	263,300	234,670
Total source of funds less application of funds	38,122	-43,702	-80,350	63,398	-25,472	-26,675	153,157	220,200	199,984	150,411

The 2022-23 average 50:50 sharemilkers' cash operating surplus was \$250,934, lower than in the previous two seasons (Table 9.1). This translates to \$1.38 per kilogram of milksolids (Table 13.5). The 2022-23 average level of discretionary cash was \$168,587 per farm, \$90,021 lower than in the previous season. Despite the reduction in the 2022-23, the average discretionary cash for sharemilkers has maintained a strong position since the 2016-17 season (Table 13.5). The average term liabilities per kilogram of milksolids declined to \$2.29 in the 2022-23 season, the lowest of the last 10 seasons (Table 9.2).

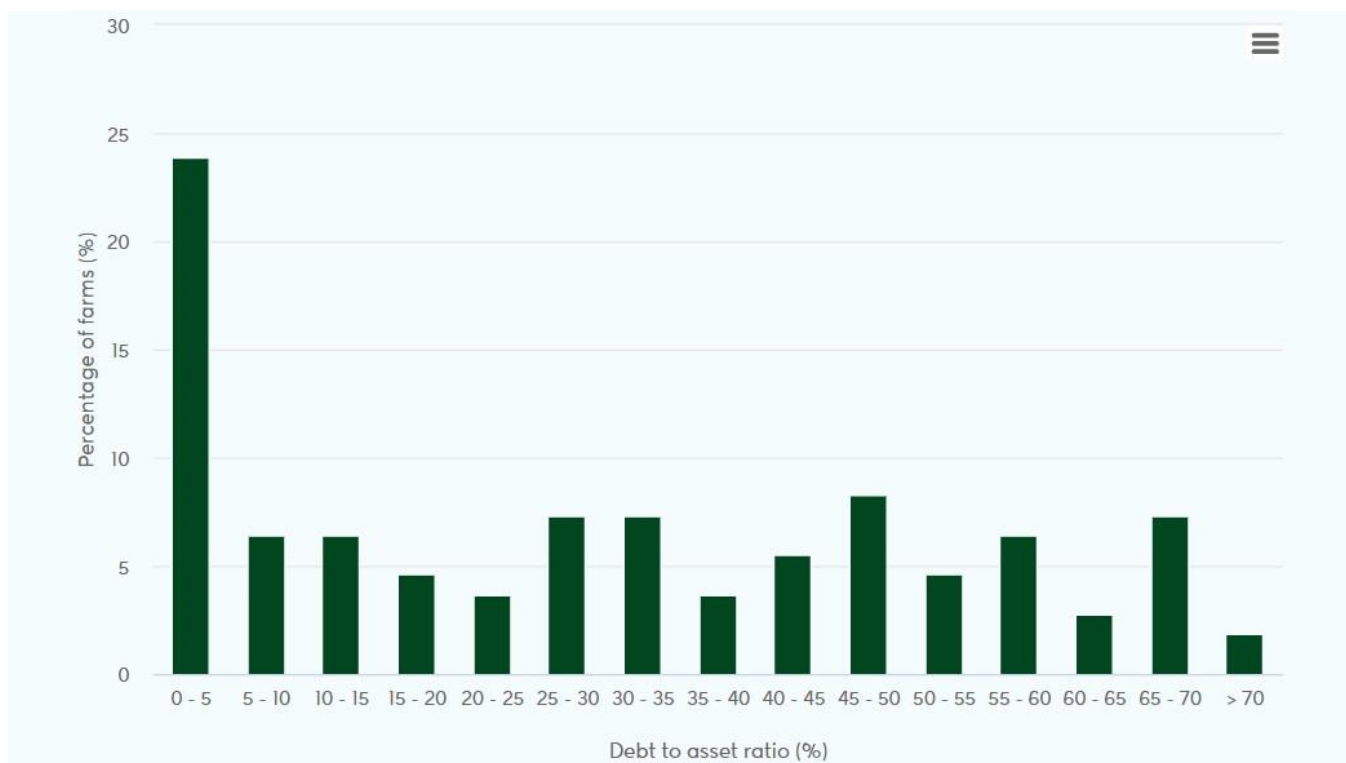
Table 9.2: Debt Servicing Ratios

Variable	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
Interest & rent \$/kg MS	0.27	0.24	0.27	0.25	0.23	0.20	0.16	0.12	0.12	0.16
Interest & rent % GFR	6.2	7.1	11.5	7.3	6.1	5.6	4.1	2.9	2.3	3.5
Term liabilities \$/kg MS	3.71	3.36	4.07	4.05	3.81	3.78	3.19	2.91	2.67	2.29

The debt to asset ratio increased marginally from 36.5 percent at the close of 2021-22 to 36.6 percent in 2022-23. Debt to asset values have significantly fallen from a period of high debt to asset ratios from 2015-16 to 2018-19, corresponding with stronger milk payouts for sharemilkers.

Graph 9.1 shows the distribution of debt to asset ratio for 50:50 sharemilkers in the 2022-23 season. About 63 percent of farms had a debt to asset ratio below 40 percent. Less than two percent of farms had a debt to asset ratio over 70 percent.

Graph 9.1: Debt to Asset Distribution



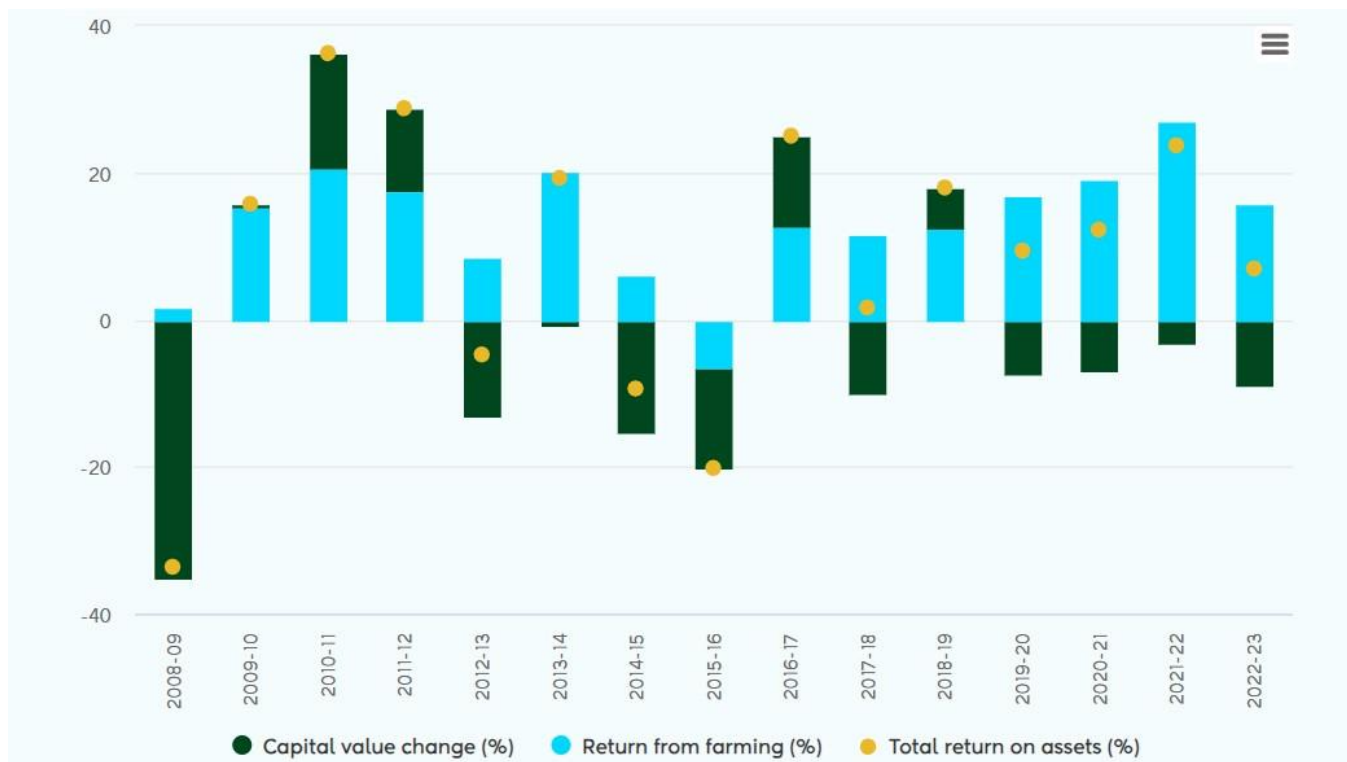
9.4. Returns

The return on dairy assets is discussed under farm profitability (Section 8.4). The total return on assets considers operating profit from both dairy and non-dairy farming operations, plus the change in the value of capital assets. The total return on assets in 2022-23 was 6.8 percent (Table 13.7).

Net returns from dairy activity yielded \$162,696 per farm in the 2022-23 season, combined with an average change in capital value of -\$69,170 per farm. 50:50 Sharemilker returns are more volatile than those earned by owner-operators due to livestock being their largest asset class and livestock values fluctuating with greater magnitude than land prices.

During the last 10 years (2012-13 to 2021-22) the total return on assets has ranged between -20.2 and 25.1 percent, as a result of changes in capital and returns from farming operations (Figure 9.3).

Graph 9.2: Sharemilker Total Return on Assets



The percentage return on equity is the return on the owner’s funds, including capital changes after interest is paid (Table 13.7). The return on equity will be higher than the total return on assets when the latter is greater than the cost of debt and vice versa. In 2022-23 the total return on equity was 9.4 percent (Table 13.7), significantly lower than in the previous four seasons, but higher than the 2022-23 total return on assets (6.8 percent). The 2022-23 season was the fifth season in a row with a positive return on equity.

10.50:50 Sharemilkers: Regional Financial Analysis

10.1. Regional Profitability

DairyBase® classifies farms into eight regions, five in the North Island and three in the South Island (refer to Section 2.6). Table 10.1 and 10.2 shows key 2022-23 average performance indicators per kilo milksolids for 50:50 sharemilker farms in these eight regions. The low number of farms in the regions presented here may also reduce the representativeness of the sample. Both Table 10.1 and 10.2 report median values to reduce numerical bias created by the average of sums methodology in regional samples. Thus, totals and sub-totals in these tables will better represent average values of the data sample but will not add up. See section 2.11 for an explanation of this methodology.

Bay of Plenty had the smallest average herd size of 302 cows, followed by Taranaki (324). The average herd sizes in the South Island were considerably larger than in the North Island. Canterbury had the largest average herd size in the South Island with 785 cows, 197 cows above the South Island simple average (588), while the average herd size in Otago-Southland was 565 cows.

The regional range of stocking rates varies between 2.0 and 3.7 cows per hectare. West Coast - Top of the South (2 cows/ha) and Northland (2.3 cows/ha) had the lowest stocking rates. Canterbury had the highest stocking rate at 3.7 cows per hectare, while the remaining regions had average stocking rates between 2.7 and 3.

The regional averages for milksolids production per cow varied between 342 and 475 in 2022-23. West Coast - Top of the South recorded the lowest average milksolids production per cow of all the regions (342 kg MS). The North Island regions recorded milksolids per cow between 363 and 413 kg MS. Otago - Southland recorded the highest milksolids sold per cow (475 kg MS), while Canterbury recorded the highest milksolids sold per hectare of 1,561 (Table 10.1).

The average payout received in each region was at or above \$4.10 per kilogram of milksolids. Regional average farm working expenses (FWE) per kilogram of milksolids were lowest in Taranaki (\$2.88). The highest FWE per kilogram of milksolids was reported in West Coast - Top of the South (\$3.48). The bottom of Table 10.1 shows the regional gross farm revenue, operating expenses and operating profit levels on a per hectare basis in 2022-23. Otago - Southland recorded the highest operating profit on a per hectare basis (\$1,363), while West Coast - Top of the South recorded the lowest operating profit per hectare at \$359/ha, however they were not the only region with average dairy operating profit less than \$1,000/ha.

West Coast - Top of the South and Northland recorded the lowest gross farm revenue per hectare (\$3,296 and \$4,251, respectively) and the lowest operating expenses per hectare (\$3,183 and \$3,746, respectively). Canterbury recorded the highest gross farm revenue (\$7,408) and operating expenses (\$6,159) per hectare. 50:50 sharemilkers in Otago - Southland and Bay of Plenty experienced higher levels of profitability in 2022-23 relative to other regions.

Table 10.1: Regional Sharemilker Profitability (\$/kg MS) 2022/23

Variable	Northland	Waikato	Bay of Plenty	Taranaki	Lower North Island	West Coast - Top of the South	Canterbury	Otago - Southland
PHYSICAL CHARACTERISTICS								
Number of herds	11	30	10	16	10	7	11	14
Effective hectares	179	112	104	108	134	216	219	200
Peak cows milked	410	332	302	324	379	413	785	565
Stocking rate (cows/ha)	2.3	3.0	2.9	2.9	2.7	2.0	3.7	2.8
Kg milksolids sold	155,675	131,494	121,764	130,108	165,862	131,181	338,000	269,034
Milksolids sold per hectare	905	1,191	1,191	1,189	1,079	658	1,561	1,337
Milksolids sold per cow	363	389	403	413	408	342	455	475
PAYOUT RECEIVED (\$/kg MS sold)	4.27	4.20	4.19	4.25	4.16	4.38	4.10	4.28
DAIRY CASH INCOME (\$/kg MS):								
Milk sales (net of dairy levies)	4.27	4.20	4.19	4.25	4.16	4.38	4.10	4.28
Net livestock sales (sales - purchases)	0.94	0.35	0.29	0.38	0.39	0.53	0.43	0.31
Other dairy cash income	0.01	0.01	0.01	0.01	0.00	0.02	0.00	0.00
Net dairy cash income	5.17	4.54	4.51	4.73	4.58	4.98	4.50	4.74
CASH FARM WORKING EXPENSES (\$/kg MS):								
Wages	0.62	0.43	0.37	0.43	0.63	0.48	0.56	0.57
Animal health	0.23	0.29	0.31	0.26	0.30	0.25	0.30	0.26
Breeding & herd improvement	0.18	0.19	0.19	0.16	0.21	0.21	0.15	0.17
Farm dairy	0.06	0.05	0.04	0.07	0.05	0.04	0.05	0.05
Electricity	0.12	0.12	0.12	0.14	0.13	0.12	0.09	0.09
Net feed made, purchased, cropped	1.02	0.79	0.76	0.68	0.77	0.51	0.73	0.73
Stock grazing	0.11	0.21	0.20	0.20	0.02	0.34	0.73	0.52
Support block lease	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fertiliser (including Nitrogen)	0.31	0.18	0.19	0.18	0.22	0.31	0.21	0.15
Irrigation	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00
Regrassing	0.02	0.01	0.03	0.01	0.03	0.02	0.01	0.00
Weed & pest	0.01	0.01	0.00	0.00	0.01	0.00	0.00	0.01
Vehicles & fuel	0.30	0.19	0.22	0.18	0.21	0.36	0.13	0.18
Repairs & maintenance	0.08	0.09	0.06	0.08	0.07	0.08	0.07	0.09
Freight & general	0.07	0.07	0.07	0.07	0.05	0.17	0.05	0.07
Administration	0.10	0.11	0.09	0.08	0.10	0.15	0.09	0.08
Insurance	0.04	0.04	0.04	0.05	0.04	0.08	0.03	0.04
ACC	0.04	0.03	0.03	0.03	0.02	0.04	0.03	0.03
Rates	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Farm working expenses	3.45	2.93	2.89	2.88	3.22	3.48	3.40	3.20
Cash operating surplus	1.88	1.42	1.45	1.77	1.33	1.71	1.07	1.53
ADJUSTMENTS (\$/kg MS):								
Value of change in dairy livestock	-0.13	0.18	0.13	0.01	0.09	0.07	0.06	0.16
Less labour adjustment	0.77	0.68	0.66	0.79	0.69	0.82	0.36	0.45
Plus feed inventory adjustment	0.00	0.05	0.04	0.00	0.01	0.01	0.00	0.00
Less owned support block adjustment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Less depreciation	0.21	0.18	0.15	0.15	0.17	0.26	0.14	0.17
Net Adjustments	-1.19	-0.78	-0.55	-0.93	-0.68	-1.17	-0.42	-0.45
OPERATING CASH & NON-CASH (\$/kg MS):								
Dairy gross farm revenue	4.91	4.61	4.61	4.69	4.78	4.88	4.55	4.86
Dairy operating expenses	4.24	3.69	3.56	3.65	4.12	4.52	3.92	3.71
Dairy operating profit	0.59	0.73	1.04	0.93	0.67	0.33	0.74	1.14

OPERATING CASH & NON-CASH (\$/ha):

Dairy gross farm revenue	4,251	5,538	5,393	5,530	5,031	3,296	7,408	6,313
Dairy operating expenses	3,746	4,581	4,199	4,487	4,246	3,183	6,159	5,041
Dairy operating profit	402	922	1,235	1,173	669	359	1,225	1,363
Operating profit margin (%)	12.1	15.8	22.6	20.0	15.5	6.9	15.7	23.4

Table 10.2 shows the eight regions' key 2022-23 financial indicators. The values reported in this table are medians (see section 2.11 for more information). Regional average operating returns on dairy assets ranged between 6.0 and 19.8 percent. Otago - Southland (19.8 percent), Taranaki (17.8 percent) and Bay of Plenty (17.7 percent) had the highest operating returns on dairy assets in 2022-23. West Coast - Top of the South had the lowest operating returns on dairy assets (6.0 percent). West Coast - Top of the South (-2.0 percent) and Northland (-0.8 percent) were the only regions to report negative total return on assets, conversely Otago - Southland had the highest total return on assets (13.1 percent) followed by Bay of Plenty (9.2 percent).

Total return on equity is the return on the owner's funds, including capital changes after interest is paid. Similar to total return on assets, the West Coast - Top of the South (-8.9 percent) and Northland (-1.9 percent) reported negative returns on equity, while the rest of the regions reported positive returns varying from 4 percent to 17.1 percent (Table 10.2). Otago - Southland reported the highest return on equity at 17.1%, followed by Bay of Plenty with 14 percent. The average term debt per kilogram of milksolids varied between \$1.3 (Canterbury) and \$3.61 (West Coast - Top of the South) in 2022-23 (Table 10.2).

Table 10.2: Regional 50:50 Sharemilker Financial Position 2022/23

Variable	Northland	Waikato	Bay of Plenty	Taranaki	Lower North Island	West Coast - Top of the South	Canterbury	Otago - Southland
RETURNS:								
Operating return on dairy assets %	6.6	14.9	17.7	17.8	12.0	6.0	14.6	19.8
Total return on assets %	-0.8	4.7	9.2	6.4	4.8	-2.0	5.9	13.1
Total return on equity %	-1.9	4.0	14.0	8.9	4.4	-8.9	9.3	17.1
Growth in equity %	2.2	4.9	7.6	8.1	0.6	-3.5	5.8	11.0
DEBT:								
Closing term liabilities (\$/kg MS sold)	1.42	2.10	1.58	2.67	2.23	3.61	1.28	1.47
Closing debt to asset %	22.3	36.3	30.7	32.0	39.4	44.6	26.0	30.2

11. Dairy Tomorrow Measures

11.1. Annual Update

The Dairy Tomorrow Strategy outlines the aspirations that the New Zealand dairy sector wants to achieve to be competitive, productive, trusted, and valued. A core part of the Strategy is the development of an integrated set of measures for dairy farms. This report focuses on the four measures that together have been selected to help capture the international competitiveness and resilience of the New Zealand dairy sector from an economic perspective. These measures are:

- The cost of production, measured in terms of dollars per kilogram of milksolids, is a popular metric in global studies of competitiveness. In the New Zealand context, it is measured as operating expenses (\$) per kilogram of milksolids. A lower cost of production mitigates the impact of a low milk price on profitability and results in increased operating profit during high milk prices. It is a key measure of resilience as a low cost of production helps to buffer the impacts of a change in the milk price on a farm business.
- The dairy operating profit margin (%) is the ratio of operating profit and gross farm revenue. The dairy operating profit margin is a percentage most often between zero and fifty. A higher value denotes that a farm produces a given level of revenue at a lower cost, indicating that it can better survive through turbulent market and production conditions.
- The operating return on dairy assets, measured in percentage terms, is a key financial metric used worldwide to measure how effectively a business is employing their asset base. This metric captures the ability of a farm to grow through careful, considered investment in high-performing assets.
- The equity to milksolids metric, measured in dollars per kilogram of milksolids terms, reflects resilience through its focus on the value of the farm business asset that is owned and not borrowed. Controlling for the level of milk production makes it easier to compare across farms, both nationally and globally.

The Dairy Tomorrow measures are reported in Tables 11.1 through 11.4 by quartiles and the mean. The quartiles can be interpreted as follows:

- The 25th percentile for a variable represents a value where 25 percent of the data is lower.
- The 50th percentile or median represents the centre of the data, such that 50 percent of data points are lower, and 50 percent are higher than this value.
- The 75th percentile represents a value such that 75 percent of observations are lower than this value.

In comparison, the mean is an average calculated by adding all values together and dividing by the number of observations. The mean provides an average across the values for all observations.

Table 11.1: Cost of Production

COST OF PRODUCTION (Operating expenses / kg MS)	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
25th percentile	5.71	5.35	4.66	5.32	5.62	5.69	5.95	5.94	7.09	7.51
Mean	5.21	4.85	4.36	4.72	5.12	5.18	5.47	5.44	6.51	6.84
50th percentile	5.15	4.76	4.21	4.57	5.02	5.15	5.38	5.34	6.43	6.72
75th percentile	4.55	4.3	3.9	4.13	4.55	4.61	4.88	4.84	5.72	6.02

Note:

- Cost of production = Operating expenses

Table 11.2: Operating Profit Margin

OPERATING PROFIT MARGIN (%)	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
25th percentile	31.5	17	-6.3	19.3	23.1	20.1	21.7	25.5	28.2	20
Mean	37	23.7	2.2	27.5	29.7	26.5	28.5	31.5	34.1	26.4
50th percentile	37.2	24.6	4.7	30.5	30.9	26.5	30	32.5	35.3	27.1
75th percentile	44.7	33.2	12.1	36.1	36.1	33.8	35.5	38.9	41.6	34.7

Table 11.3: Operating Return on Assets

OPERATING RETURN ON DAIRY ASSETS (%)	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
25th percentile	5.1	2.2	-0.7	2.7	3.2	2.7	3.2	4.3	5.4	3.4
Mean	8.2	3.7	-0.1	4.4	5.3	4.0	5.2	6.3	7.6	5.3
50th percentile	6.9	3.4	0.1	4.3	4.5	3.9	4.8	5.8	7.3	5.2
75th percentile	8.9	4.8	1.0	5.4	6.3	5.2	6.8	8.0	9.6	6.9

Table 11.4: Equity

EQUITY (\$/kg MS)	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
25th percentile	16.57	18.93	13.08	18.32	14.92	13.42	13.62	14.09	17.53	18.52
Mean	28.71	28.38	25.06	30.78	27.19	25.22	26.26	26.52	32.70	35.01
50th percentile	26.25	27.63	22.08	26.28	25.09	20.61	21.60	22.17	26.59	27.75
75th percentile	39.71	37.29	34.14	41.17	33.99	34.17	35.09	33.43	40.03	42.10

12. Time Series Tables: Owner Operator

Table 12.1: Cash Operating Surplus and Operating Profit - \$ per farm

Variable	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
PHYSICAL CHARACTERISTICS										
Number of herds	301	296	279	316	265	260	326	308	255	266
Effective hectares	143	146	148	148	151	146	142	141	144	145
Peak cows milked	402	419	418	414	430	424	415	408	419	407
Stocking rate (cows/ha)	2.8	2.9	2.8	2.8	2.8	2.9	2.9	2.9	2.9	2.8
Kg milksolids sold	151,455	160,367	160,270	160,302	161,567	167,189	169,761	171,720	172,832	169,990
Milksolids sold per hectare	1,060	1,102	1,082	1,085	1,067	1,145	1,194	1,222	1,199	1,174
Milksolids sold per cow	377	383	383	387	376	395	409	421	413	418
PAYOUT RECEIVED (\$/kg MS sold)	7.69	5.76	3.92	5.79	6.62	6.42	7.05	7.40	9.19	8.68
DAIRY CASH INCOME (\$):										
Milk sales (net of dairy levies)	1,164,274	923,621	628,192	928,944	1,068,927	1,073,346	1,197,023	1,271,447	1,588,525	1,475,356
Net livestock sales (sales - purchases)	57,832	83,804	90,596	79,495	80,967	77,911	82,883	83,337	95,756	86,782
Other dairy cash income	6,338	6,466	5,819	5,633	6,789	6,377	5,836	7,705	7,495	8,155
Net dairy cash income	1,228,444	1,013,891	724,607	1,014,072	1,156,683	1,157,633	1,285,742	1,362,488	1,691,776	1,570,293
CASH FARM WORKING EXPENSES (\$):										
Wages	90,565	97,790	103,689	92,630	106,331	110,011	113,880	111,931	123,332	133,711
Animal health	35,800	36,553	30,906	34,577	37,497	37,958	40,754	41,674	51,240	52,827
Breeding & herd improvement	20,485	23,746	19,702	21,986	25,043	27,336	28,626	28,930	30,470	31,339
Farm dairy	10,068	9,693	7,902	9,636	9,433	9,773	10,804	10,391	11,569	13,478
Electricity	17,342	17,636	17,646	18,352	18,256	18,521	18,818	19,217	20,233	20,242
Net feed made, purchased, cropped	156,489	152,147	118,281	120,103	151,337	167,341	175,287	186,564	245,970	259,152
Stock grazing	53,919	64,319	64,317	58,368	58,254	71,042	72,720	70,207	73,343	87,739
Support block lease	11,519	11,992	12,385	12,322	10,882	9,548	10,371	10,285	13,850	9,924
Fertiliser (including Nitrogen)	86,711	75,738	66,595	73,964	77,478	77,175	77,691	75,625	101,368	114,986
Irrigation	4,527	9,367	7,987	8,527	8,314	12,833	18,773	16,270	14,191	13,496
Regrassing	10,423	9,776	7,751	9,913	12,503	11,654	12,456	12,321	15,067	15,005
Weed & pest	6,387	5,502	5,561	5,631	5,951	5,299	5,441	5,567	7,981	6,990
Vehicles & fuel	32,423	28,918	26,704	29,220	31,584	30,955	30,230	28,783	39,257	43,802
Repairs & maintenance	62,561	52,240	35,753	46,630	63,665	58,032	61,811	70,505	89,439	85,992
Freight & general	9,030	8,700	8,666	7,755	8,518	7,912	12,330	12,109	14,389	15,164
Administration	17,697	17,680	18,974	17,895	19,675	21,182	24,213	24,300	27,755	30,497
Insurance	9,718	10,773	10,252	10,947	12,635	13,587	13,961	14,319	16,302	17,533
ACC	4,321	4,134	3,690	3,445	3,785	3,750	3,134	4,785	5,041	5,492
Rates	15,873	15,915	16,089	16,761	17,031	17,022	16,979	17,212	19,289	19,427
Farm working expenses	655,858	652,619	582,850	598,662	678,172	710,932	748,282	760,996	920,087	976,798
Cash operating surplus	572,586	361,272	141,757	415,410	478,511	446,701	537,460	601,492	771,689	593,495
ADJUSTMENTS (\$):										
Value of change in dairy livestock	24,912	2,632	-13,067	9,835	11,378	8,780	7,282	230	3,176	877
Less labour adjustment	59,309	59,021	56,341	61,154	63,920	62,545	62,011	70,195	79,852	80,362
Plus feed inventory adjustment	5,340	-210	3,453	2,790	-2,413	3,164	-3,484	5,884	-1,929	17,404
Less owned support block adjustment	15,338	14,889	14,126	14,359	16,786	13,143	16,151	16,720	18,843	20,738
Less depreciation	57,383	66,154	62,967	66,295	67,899	68,522	72,265	71,559	76,161	73,834
Net Adjustments	-101,778	-137,642	-143,048	-129,183	-139,640	-132,266	-146,629	-152,360	-173,609	-156,653
OPERATING CASH & NON-CASH:										
Dairy gross farm revenue	1,253,356	1,016,523	711,540	1,023,907	1,168,061	1,166,413	1,293,024	1,362,718	1,694,953	1,571,170
Dairy operating expenses	782,548	792,893	712,831	737,680	829,190	851,978	902,193	913,587	1,096,872	1,134,328
Dairy operating profit	470,808	223,630	-1,291	286,227	338,871	314,435	390,831	449,132	598,081	436,843

Table 12.2: Cash Operating Surplus and Operating Profit - \$ per cow

Variable	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
PHYSICAL CHARACTERISTICS										
Number of herds	301	296	279	316	265	260	326	308	255	266
Effective hectares	143	146	148	148	151	146	142	141	144	145
Peak cows milked	402	419	418	414	430	424	415	408	419	407
Stocking rate (cows/ha)	2.8	2.9	2.8	2.8	2.8	2.9	2.9	2.9	2.9	2.8
Kg milksolids sold	151,455	160,367	160,270	160,302	161,567	167,189	169,761	171,720	172,832	169,990
Milksolids sold per hectare	1,060	1,102	1,082	1,085	1,067	1,145	1,194	1,222	1,199	1,174
Milksolids sold per cow	377	383	383	387	376	395	409	421	413	418
PAYOUT RECEIVED (\$/kg MS sold)	7.69	5.76	3.92	5.79	6.62	6.42	7.05	7.40	9.19	8.68
DAIRY CASH INCOME (\$/cow):										
Milk sales (net of dairy levies)	2,896	2,204	1,503	2,244	2,486	2,534	2,886	3,118	3,792	3,628
Net livestock sales (sales - purchases)	144	200	217	192	188	184	200	204	229	213
Other dairy cash income	16	15	14	14	16	15	14	19	18	20
Net dairy cash income	3,056	2,420	1,734	2,449	2,690	2,733	3,100	3,341	4,038	3,861
CASH FARM WORKING EXPENSES (\$/cow):										
Wages	225	233	248	224	247	260	275	274	294	329
Animal health	89	87	74	84	87	90	98	102	122	130
Breeding & herd improvement	51	57	47	53	58	65	69	71	73	77
Farm dairy	25	23	19	23	22	23	26	25	28	33
Electricity	43	42	42	44	42	44	45	47	48	50
Net feed made, purchased, cropped	389	363	283	290	352	395	423	457	587	637
Stock grazing	134	154	154	141	135	168	175	172	175	216
Support block lease	29	29	30	30	25	23	25	25	33	24
Fertiliser (including Nitrogen)	216	181	159	179	180	182	187	185	242	283
Irrigation	11	22	19	21	19	30	45	40	34	33
Regrassing	26	23	19	24	29	28	30	30	36	37
Weed & pest	16	13	13	14	14	13	13	14	19	17
Vehicles & fuel	81	69	64	71	73	73	73	71	94	108
Repairs & maintenance	156	125	86	113	148	137	149	173	213	211
Freight & general	22	21	21	19	20	19	30	30	34	37
Administration	44	42	45	43	46	50	58	60	66	75
Insurance	24	26	25	26	29	32	34	35	39	43
ACC	11	10	9	8	9	9	8	12	12	14
Rates	39	38	38	40	40	40	41	42	46	48
Farm working expenses	1,631	1,558	1,394	1,446	1,577	1,678	1,804	1,866	2,196	2,402
Cash operating surplus	1,424	862	339	1,003	1,113	1,055	1,296	1,475	1,842	1,459
ADJUSTMENTS (\$/cow):										
Value of change in dairy livestock	62	6	-31	24	26	21	18	1	8	2
Less labour adjustment	148	141	135	148	149	148	149	172	191	198
Plus feed inventory adjustment	13	-1	8	7	-6	7	-8	14	-5	43
Less owned support block adjustment	38	36	34	35	39	31	39	41	45	51
Less depreciation	143	158	151	160	158	162	174	175	182	182
Net Adjustments	-253	-329	-342	-312	-325	-312	-353	-374	-414	-385
OPERATING CASH & NON-CASH (\$/cow)										
Dairy gross farm revenue	3,118	2,426	1,702	2,473	2,716	2,754	3,117	3,341	4,046	3,863
Dairy operating expenses	1,947	1,892	1,705	1,782	1,928	2,011	2,175	2,240	2,618	2,789
Dairy operating profit	1,171	534	-3	691	788	742	942	1,101	1,428	1,074

Table 12.3: Cash Operating Surplus and Operating Profit - \$ per effective hectare

Variable	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
PHYSICAL CHARACTERISTICS										
Number of herds	301	296	279	316	265	260	326	308	255	266
Effective hectares	143	146	148	148	151	146	142	141	144	145
Peak cows milked	402	419	418	414	430	424	415	408	419	407
Stocking rate (cows/ha)	2.8	2.9	2.8	2.8	2.8	2.9	2.9	2.9	2.9	2.8
Kg milksolids sold	151,455	160,367	160,270	160,302	161,567	167,189	169,761	171,720	172,832	169,990
Milksolids sold per hectare	1,060	1,102	1,082	1,085	1,067	1,145	1,194	1,222	1,199	1,174
Milksolids sold per cow	377	383	383	387	376	395	409	421	413	418
PAYOUT RECEIVED (\$/kg MS sold)	7.69	5.76	3.92	5.79	6.62	6.42	7.05	7.40	9.19	8.68
DAIRY CASH INCOME (\$/ha):										
Milk sales (net of dairy levies)	8,147	6,348	4,242	6,285	7,060	7,353	8,421	9,046	11,022	10,189
Net livestock sales (sales - purchases)	405	576	612	538	535	534	583	593	664	599
Other dairy cash income	44	44	39	38	45	44	41	55	52	56
Net dairy cash income	8,597	6,968	4,893	6,861	7,640	7,930	9,046	9,694	11,739	10,845
CASH FARM WORKING EXPENSES (\$/ha):										
Wages	634	672	700	627	702	754	801	796	856	923
Animal health	251	251	209	234	248	260	287	296	356	365
Breeding & herd improvement	143	163	133	149	165	187	201	206	211	216
Farm dairy	70	67	53	65	62	67	76	74	80	93
Electricity	121	121	119	124	121	127	132	137	140	140
Net feed made, purchased, cropped	1,095	1,046	799	813	1,000	1,146	1,233	1,327	1,707	1,790
Stock grazing	377	442	434	395	385	487	512	499	509	606
Support block lease	81	82	84	83	72	65	73	73	96	69
Fertiliser (including Nitrogen)	607	521	450	500	512	529	547	538	703	794
Irrigation	32	64	54	58	55	88	132	116	98	93
Regrassing	73	67	52	67	83	80	88	88	105	104
Weed & pest	45	38	38	38	39	36	38	40	55	48
Vehicles & fuel	227	199	180	198	209	212	213	205	272	303
Repairs & maintenance	438	359	241	315	421	398	435	502	621	594
Freight & general	63	60	59	52	56	54	87	86	100	105
Administration	124	122	128	121	130	145	170	173	193	211
Insurance	68	74	69	74	83	93	98	102	113	121
ACC	30	28	25	23	25	26	22	34	35	38
Rates	111	109	109	113	112	117	119	122	134	134
Farm working expenses	4,590	4,485	3,936	4,050	4,479	4,870	5,264	5,414	6,384	6,746
Cash operating surplus	4,007	2,483	957	2,811	3,161	3,060	3,781	4,279	5,355	4,099
ADJUSTMENTS (\$/ha):										
Value of change in dairy livestock	174	18	-88	67	75	60	51	2	22	6
Less labour adjustment	415	406	380	414	422	428	436	499	554	555
Plus feed inventory adjustment	37	-1	23	19	-16	22	-25	42	-13	120
Less owned support block adjustment	107	102	95	97	111	90	114	119	131	143
Less depreciation	402	455	425	449	448	469	508	509	528	510
Net Adjustments	-712	-946	-966	-874	-922	-906	-1,032	-1,084	-1,205	-1,082
OPERATING CASH & NON-CASH (\$/ha):										
Dairy gross farm revenue	8,771	6,986	4,804	6,928	7,715	7,991	9,097	9,695	11,761	10,851
Dairy operating expenses	5,476	5,449	4,813	4,991	5,477	5,837	6,347	6,500	7,611	7,834
Dairy operating profit	3,295	1,537	-9	1,937	2,238	2,154	2,750	3,195	4,150	3,017

Table 12.4: Cash Operating Surplus and Operating Profit - \$ per kg milksolids sold

Variable	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
PHYSICAL CHARACTERISTICS										
Number of herds	301	296	279	316	265	260	326	308	255	266
Effective hectares	143	146	148	148	151	146	142	141	144	145
Peak cows milked	402	419	418	414	430	424	415	408	419	407
Stocking rate (cows/ha)	2.8	2.9	2.8	2.8	2.8	2.9	2.9	2.9	2.9	2.8
Kg milksolids sold	151,455	160,367	160,270	160,302	161,567	167,189	169,761	171,720	172,832	169,990
Milksolids sold per hectare	1,060	1,102	1,082	1,085	1,067	1,145	1,194	1,222	1,199	1,174
Milksolids sold per cow	377	383	383	387	376	395	409	421	413	418
PAYOUT RECEIVED (\$/kg MS sold)	7.69	5.76	3.92	5.79	6.62	6.42	7.05	7.40	9.19	8.68
DAIRY CASH INCOME (\$/kg MS):										
Milk sales (net of dairy levies)	7.69	5.76	3.92	5.79	6.62	6.42	7.05	7.40	9.19	8.68
Net livestock sales (sales - purchases)	0.38	0.52	0.57	0.50	0.50	0.47	0.49	0.49	0.55	0.51
Other dairy cash income	0.04	0.04	0.04	0.04	0.04	0.04	0.03	0.04	0.04	0.05
Net dairy cash income	8.11	6.32	4.52	6.33	7.16	6.92	7.57	7.93	9.79	9.24
CASH FARM WORKING EXPENSES (\$/kg MS):										
Wages	0.60	0.61	0.65	0.58	0.66	0.66	0.67	0.65	0.71	0.79
Animal health	0.24	0.23	0.19	0.22	0.23	0.23	0.24	0.24	0.30	0.31
Breeding & herd improvement	0.14	0.15	0.12	0.14	0.16	0.16	0.17	0.17	0.18	0.18
Farm dairy	0.07	0.06	0.05	0.06	0.06	0.06	0.06	0.06	0.07	0.08
Electricity	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.12	0.12
Net feed made, purchased, cropped	1.03	0.95	0.74	0.75	0.94	1.00	1.03	1.09	1.42	1.52
Stock grazing	0.36	0.40	0.40	0.36	0.36	0.42	0.43	0.41	0.42	0.52
Support block lease	0.08	0.07	0.08	0.08	0.07	0.06	0.06	0.06	0.08	0.06
Fertiliser (including Nitrogen)	0.57	0.47	0.42	0.46	0.48	0.46	0.46	0.44	0.59	0.68
Irrigation	0.03	0.06	0.05	0.05	0.05	0.08	0.11	0.09	0.08	0.08
Regrassing	0.07	0.06	0.05	0.06	0.08	0.07	0.07	0.07	0.09	0.09
Weed & pest	0.04	0.03	0.03	0.04	0.04	0.03	0.03	0.03	0.05	0.04
Vehicles & fuel	0.21	0.18	0.17	0.18	0.20	0.19	0.18	0.17	0.23	0.26
Repairs & maintenance	0.41	0.33	0.22	0.29	0.39	0.35	0.36	0.41	0.52	0.51
Freight & general	0.06	0.05	0.05	0.05	0.05	0.05	0.07	0.07	0.08	0.09
Administration	0.12	0.11	0.12	0.11	0.12	0.13	0.14	0.14	0.16	0.18
Insurance	0.06	0.07	0.06	0.07	0.08	0.08	0.08	0.08	0.09	0.10
ACC	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.03	0.03	0.03
Rates	0.10	0.10	0.10	0.10	0.11	0.10	0.10	0.10	0.11	0.11
Farm working expenses	4.33	4.07	3.64	3.73	4.20	4.25	4.41	4.43	5.32	5.75
Cash operating surplus	3.78	2.25	0.88	2.59	2.96	2.67	3.17	3.50	4.46	3.49
ADJUSTMENTS (\$/kg MS):										
Value of change in dairy livestock	0.16	0.02	-0.08	0.06	0.07	0.05	0.04	0.00	0.02	0.01
Less labour adjustment	0.39	0.37	0.35	0.38	0.40	0.37	0.37	0.41	0.46	0.47
Plus feed inventory adjustment	0.04	0.00	0.02	0.02	-0.01	0.02	-0.02	0.03	-0.01	0.10
Less owned support block adjustment	0.10	0.09	0.09	0.09	0.10	0.08	0.10	0.10	0.11	0.12
Less depreciation	0.38	0.41	0.39	0.41	0.42	0.41	0.43	0.42	0.44	0.43
Net Adjustments	-0.67	-0.86	-0.89	-0.81	-0.86	-0.79	-0.86	-0.89	-1.00	-0.92
OPERATING CASH & NON-CASH (\$/kg MS):										
Dairy gross farm revenue	8.28	6.34	4.44	6.39	7.23	6.98	7.62	7.94	9.81	9.24
Dairy operating expenses	5.17	4.94	4.45	4.60	5.13	5.10	5.31	5.32	6.35	6.67
Dairy operating profit	3.11	1.39	-0.01	1.79	2.10	1.88	2.30	2.62	3.46	2.57

Table 12.5: Cashflow

Variable	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
PHYSICAL CHARACTERISTICS										
Number of herds	301	296	279	316	265	260	326	308	255	266
Effective hectares	143	146	148	148	151	146	142	141	144	145
Peak cows milked	402	419	418	414	430	424	415	408	419	407
Stocking rate (cows/ha)	2.8	2.9	2.8	2.8	2.8	2.9	2.9	2.9	2.9	2.8
Kg milksolids sold	151,455	160,367	160,270	160,302	161,567	167,189	169,761	171,720	172,832	169,990
Milksolids sold per hectare	1,060	1,102	1,082	1,085	1,067	1,145	1,194	1,222	1,199	1,174
Milksolids sold per cow	377	383	383	387	376	395	409	421	413	418
PAYOUT RECEIVED (\$/kg MS sold)	7.69	5.76	3.92	5.79	6.62	6.42	7.05	7.40	9.19	8.68
CASHFLOW:										
Net dairy cash income	1,228,444	1,013,891	724,607	1,014,072	1,156,683	1,157,633	1,285,742	1,362,488	1,691,776	1,570,293
Farm working expenses	655,858	652,619	582,850	598,662	678,172	710,932	748,282	760,996	920,087	976,798
Cash operating surplus	572,586	361,272	141,757	415,410	478,511	446,701	537,460	601,492	771,689	593,495
DISCRETIONARY CASH										
Less rent (excluding support block)	23,366	22,250	20,047	19,582	20,703	12,499	17,280	17,069	14,929	13,227
Less interest	171,597	195,984	197,277	197,343	191,459	194,022	172,460	140,608	149,895	217,165
Less tax	58,155	34,078	7,939	16,773	41,532	38,315	52,696	77,161	124,502	102,018
Plus net non-dairy cash income	2,355	486	904	3,371	6,064	7,040	10,682	3,378	7,614	5,411
Plus net off-farm income	9,991	12,078	9,238	19,811	18,114	6,670	13,167	9,838	-199	36,366
Discretionary cash	331,814	121,524	-73,364	204,894	248,995	215,575	318,873	379,870	489,778	302,861
OTHER CASH INCOME										
Plus introduced funds	-44,275	28,307	77,696	-24,004	-40,908	-2,774	-18,560	-16,833	-60,186	-909
Plus income equalisation	-4,756	-9,579	16,765	1,307	40	307	-475	875	-1,643	29
Cash available for living and growth	282,783	140,252	21,097	182,197	208,127	213,109	299,837	363,911	427,950	301,982
OTHER CASH EXPENDITURE										
Less net capital transactions	143,703	201,119	76,697	109,749	238,591	207,027	113,522	148,238	267,306	137,369
Less net debt	-10,790	-93,026	-111,777	-75,867	-92,523	-74,133	49,483	59,719	43,029	38,791
Less net drawings	116,224	110,437	78,151	82,043	104,334	95,173	92,090	106,679	114,873	117,646
Cash surplus/deficit	33,646	-78,278	-21,974	66,272	-42,275	-14,958	57,909	59,112	2,543	44,541
CASHFLOW (\$/kg MS)										
Net dairy cash income	8.11	6.32	4.52	6.33	7.16	6.92	7.57	7.93	9.79	9.24
Farm working expenses	4.33	4.07	3.64	3.73	4.20	4.25	4.41	4.43	5.32	5.75
Cash operating surplus	3.78	2.25	0.88	2.59	2.96	2.67	3.17	3.50	4.46	3.49
DISCRETIONARY CASH (\$/kg MS)										
Less rent (excluding support block)	0.15	0.14	0.13	0.12	0.13	0.07	0.10	0.10	0.09	0.08
Less interest	1.13	1.22	1.23	1.23	1.19	1.16	1.02	0.82	0.87	1.28
Less tax	0.38	0.21	0.05	0.10	0.26	0.23	0.31	0.45	0.72	0.60
Plus net non-dairy cash income	0.02	0.00	0.01	0.02	0.04	0.04	0.06	0.02	0.04	0.03
Plus net off-farm income	0.07	0.08	0.06	0.12	0.11	0.04	0.08	0.06	0.00	0.21
Discretionary cash	2.19	0.76	-0.46	1.28	1.54	1.29	1.88	2.21	2.83	1.78
OTHER CASH INCOME (\$/kg MS)										
Plus introduced funds	-0.29	0.18	0.48	-0.15	-0.25	-0.02	-0.11	-0.10	-0.35	-0.01
Plus income equalisation	-0.03	-0.06	0.10	0.01	0.00	0.00	0.00	0.01	-0.01	0.00
Cash available for living and growth	1.87	0.87	0.13	1.14	1.29	1.27	1.77	2.12	2.48	1.78
OTHER CASH EXPENDITURE (\$/kg MS)										
Less net capital transactions	0.95	1.25	0.48	0.68	1.48	1.24	0.67	0.86	1.55	0.81
Less net debt	-0.07	-0.58	-0.70	-0.47	-0.57	-0.44	0.29	0.35	0.25	0.23
Less net drawings	0.77	0.69	0.49	0.51	0.65	0.57	0.54	0.62	0.66	0.69
Cash surplus/deficit	0.22	-0.49	-0.14	0.41	-0.26	-0.09	0.34	0.34	0.01	0.26

Table 12.6: Capital Structure and Wealth Creation

Variable	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
PHYSICAL CHARACTERISTICS										
Number of herds	301	296	279	316	265	260	326	308	255	266
Effective hectares	143	146	148	148	151	146	142	141	144	145
Peak cows milked	402	419	418	414	430	424	415	408	419	407
Stocking rate (cows/ha)	2.8	2.9	2.8	2.8	2.8	2.9	2.9	2.9	2.9	2.8
Kg milksolids sold	151,455	160,367	160,270	160,302	161,567	167,189	169,761	171,720	172,832	169,990
Milksolids sold per hectare	1,060	1,102	1,082	1,085	1,067	1,145	1,194	1,222	1,199	1,174
Milksolids sold per cow	377	383	383	387	376	395	409	421	413	418
PAYOUT RECEIVED (\$/kg MS sold)	7.69	5.76	3.92	5.79	6.62	6.42	7.05	7.40	9.19	8.68
DAIRY ASSETS AT OPEN										
Land & buildings	4,474,344	5,055,041	5,473,880	5,518,535	5,849,932	6,091,560	6,039,561	5,752,162	6,339,284	6,711,501
Plant, machinery and vehicles	224,385	233,302	258,077	254,722	252,258	249,118	260,302	240,288	259,426	273,160
Livestock	873,333	967,406	812,241	640,378	834,061	754,230	737,092	730,625	755,462	821,996
Investments (excluding non-dairy)	899,384	892,639	688,384	791,795	800,126	815,583	660,658	585,604	586,494	413,317
Current assets	221,155	285,915	176,424	138,254	208,018	180,448	172,313	189,667	262,660	287,681
Total dairy assets at open	6,692,601	7,434,303	7,409,006	7,343,684	7,944,395	8,090,939	7,869,926	7,498,345	8,203,328	8,507,655
Plus non-dairy assets	225,437	207,058	258,166	267,387	403,636	353,525	351,490	371,716	480,669	510,527
Total assets	6,918,038	7,641,361	7,667,172	7,611,071	8,348,031	8,444,463	8,221,416	7,870,061	8,683,997	9,018,182
LIABILITIES AT OPEN										
Term liabilities	3,039,137	3,317,150	3,493,221	3,932,350	3,996,989	4,091,376	3,995,700	3,901,222	4,115,003	3,816,278
Current liabilities	154,442	182,128	197,175	160,682	149,261	189,611	178,179	156,630	173,275	258,035
Total liabilities	3,193,579	3,499,278	3,690,396	4,093,032	4,146,250	4,280,987	4,173,879	4,057,851	4,288,278	4,074,313
Owners equity at open	3,724,459	4,142,083	3,976,776	3,518,039	4,201,781	4,163,476	4,047,537	3,812,209	4,395,719	4,943,869
DAIRY ASSETS AT CLOSE										
Land & buildings	4,788,661	5,368,063	5,289,448	5,854,250	5,843,351	5,933,994	5,888,745	5,808,851	6,631,060	6,676,105
Plant, machinery and vehicles	252,083	233,593	243,360	249,436	255,794	246,538	253,497	240,804	286,344	287,910
Livestock	939,582	804,897	651,096	815,984	776,831	752,063	748,428	734,146	848,540	785,591
Investments (excluding non-dairy)	817,865	751,874	810,143	823,402	748,739	665,352	632,180	584,287	467,449	470,286
Current assets	279,218	186,858	151,773	194,747	195,692	163,031	205,720	241,278	309,682	292,846
Total dairy assets at close	7,077,409	7,345,285	7,145,820	7,937,819	7,820,407	7,760,977	7,728,570	7,609,364	8,543,075	8,512,738
Plus Non-dairy assets	236,874	224,823	258,766	280,232	411,434	388,794	350,613	374,638	505,088	553,792
Total assets	7,314,283	7,570,108	7,404,586	8,218,051	8,231,841	8,149,771	8,079,184	7,984,003	9,048,163	9,066,531
LIABILITIES AT CLOSE										
Term liabilities	3,049,927	3,410,176	3,604,999	4,008,218	4,089,512	4,165,930	3,946,217	3,841,503	4,071,973	3,777,487
Current liabilities	178,859	161,349	194,497	150,902	179,210	184,250	170,738	161,979	217,484	250,054
Total liabilities	3,228,786	3,571,525	3,799,496	4,159,120	4,268,722	4,350,179	4,116,954	4,003,482	4,289,457	4,027,540
Owners equity at close	4,085,497	3,998,583	3,605,090	4,058,931	3,963,119	3,799,592	3,962,230	3,980,521	4,758,706	5,038,990
EQUITY										
Growth in equity	361,038	-143,500	-371,686	540,892	-238,662	-363,884	-85,307	168,312	362,987	95,121
Growth in equity from profit	187,695	-53,784	-225,348	68,973	85,385	63,675	159,527	208,237	297,876	129,388
Growth in equity from capital	173,343	-89,716	-146,338	471,919	-324,047	-427,560	-244,765	-39,822	65,148	-34,231
Growth in equity %	9.7	-3.5	-9.3	15.4	-5.7	-8.7	-2.1	4.4	8.3	1.9
Closing debt to asset %	41.9	45.8	50.3	49.4	50.7	53.4	51.0	50.1	47.4	44.4
Closing term liabilities per kg MS	20.14	21.26	22.49	25.00	25.31	24.92	23.25	22.37	23.56	22.22

Table 12.7: Returns

Variable	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
PHYSICAL CHARACTERISTICS										
Number of herds	301	296	279	316	265	260	326	308	255	266
Effective hectares	143	146	148	148	151	146	142	141	144	145
Peak cows milked	402	419	418	414	430	424	415	408	419	407
Stocking rate (cows/ha)	2.8	2.9	2.8	2.8	2.8	2.9	2.9	2.9	2.9	2.8
Kg milksolids sold	151,455	160,367	160,270	160,302	161,567	167,189	169,761	171,720	172,832	169,990
Milksolids sold per hectare	1,060	1,102	1,082	1,085	1,067	1,145	1,194	1,222	1,199	1,174
Milksolids sold per cow	377	383	383	387	376	395	409	421	413	418
PAYOUT RECEIVED (\$/kg MS sold)	7.69	5.76	3.92	5.79	6.62	6.42	7.05	7.40	9.19	8.68
RETURN ON DAIRY ASSETS %										
Dairy operating profit	470,808	223,630	-1,291	286,227	338,871	314,435	390,831	449,132	598,081	436,843
Plus owned support block adjustment	15,338	14,889	14,126	14,359	16,786	13,143	16,151	16,720	18,843	20,738
Less rent	23,366	22,250	20,047	19,582	20,703	12,499	17,280	17,069	14,929	13,227
Net return from dairy	462,780	216,269	-7,212	281,004	334,954	315,079	389,701	448,783	601,995	444,354
Total dairy assets (less current) at open	6,471,446	7,148,388	7,232,582	7,205,430	7,736,377	7,910,490	7,697,613	7,308,678	7,940,668	8,219,974
Operating return on dairy assets %	7.2	3.0	-0.1	3.9	4.3	4.0	5.1	6.1	7.6	5.4
TOTAL RETURN ON ASSETS %										
Net return from dairy	462,780	216,269	-7,212	281,004	334,954	315,079	389,701	448,783	601,995	444,354
Plus net non-dairy profit	1,724	-673	-318	3,331	5,444	6,904	11,894	3,870	5,499	5,136
Plus change in capital value	169,567	-175,947	-301,565	430,903	-353,833	-277,275	-287,474	-78,028	46,611	-95,819
Total return	634,071	39,649	-309,095	715,238	-13,435	44,709	114,121	374,625	654,105	353,671
Total assets (less current) at open	6,696,883	7,355,446	7,490,748	7,472,817	8,140,013	8,264,015	8,221,416	7,870,061	8,683,997	9,018,182
Total return on assets %	9.5	0.5	-4.1	9.6	-0.2	0.5	1.4	4.8	7.5	3.9
TOTAL RETURN ON EQUITY %										
Total return	634,071	39,649	-309,095	715,238	-13,435	44,709	114,121	374,625	654,105	353,671
Plus net off-farm income	9,991	12,078	9,238	19,811	18,114	6,670	13,167	9,838	-199	36,366
Less interest	171,597	195,984	197,277	197,343	191,459	194,022	172,460	140,608	149,895	217,165
Total return for equity	472,332	-144,237	-497,164	537,538	-186,502	-142,643	-45,173	243,855	504,011	172,871
Equity at open	3,724,459	4,142,083	3,976,776	3,518,039	4,201,781	4,163,476	4,047,537	3,812,209	4,395,719	4,943,869
Total return on equity %	12.7	-3.5	-12.5	15.3	-4.4	-3.4	-1.1	6.4	11.5	3.5

13. Time Series Tables: 50:50 Sharemilkers

Table 13.1: Cash Operating Surplus and Operating Profit - \$ per farm

Variable	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
PHYSICAL CHARACTERISTICS										
Number of herds	114	111	109	113	108	122	124	108	87	109
Effective hectares	128	132	133	132	137	151	144	140	140	147
Peak cows milked	367	383	379	372	391	452	431	424	422	437
Stocking rate (cows/ha)	2.9	2.9	2.8	2.8	2.8	3.0	3.0	3.0	3.0	3.0
Kg milksolids sold	138,532	151,044	144,587	143,685	147,143	184,909	175,656	182,030	171,282	181,551
Milksolids sold per hectare	1,082	1,144	1,085	1,089	1,072	1,222	1,219	1,300	1,227	1,239
Milksolids sold per cow	377	394	381	386	376	410	408	429	406	416
PAYOUT RECEIVED (\$/kg MS sold)	3.76	2.88	1.88	2.82	3.21	3.17	3.45	3.65	4.54	4.14
DAIRY CASH INCOME (\$):										
Milk sales (net of dairy levies)	520,870	434,377	272,370	405,691	472,702	586,337	606,847	665,124	778,049	752,157
Net livestock sales (sales - purchases)	13,423	54,333	35,783	60,598	50,428	75,931	60,008	80,562	52,633	46,973
Other dairy cash income	3,407	2,381	3,368	2,419	2,321	2,332	3,280	4,596	3,365	6,275
Net dairy cash income	537,700	491,091	311,521	468,708	525,451	664,600	670,136	750,282	834,048	805,405
CASH FARM WORKING EXPENSES (\$):										
Wages	51,400	52,915	48,799	51,624	61,841	82,680	76,511	80,791	82,429	92,742
Animal health	34,651	35,418	28,668	31,232	34,238	43,264	41,198	43,119	49,737	52,314
Breeding & herd improvement	20,468	22,026	20,299	20,065	24,196	30,219	29,137	30,536	30,290	32,276
Farm dairy	6,631	6,653	6,629	6,886	7,538	8,922	9,415	8,627	8,671	10,200
Electricity	14,439	15,840	15,435	15,505	15,362	18,649	18,121	19,104	18,387	20,825
Net feed made, purchased, cropped	74,677	77,650	53,410	55,474	72,032	93,630	93,405	100,999	116,467	134,016
Stock grazing	39,026	50,175	42,034	34,075	46,703	60,678	58,204	53,146	58,865	66,699
Support block lease	1,308	1,403	2,206	1,834	1,666	1,380	2,840	1,817	891	3,194
Fertiliser (including Nitrogen)	20,377	21,454	18,608	18,616	21,151	25,577	27,222	24,985	29,510	36,403
Irrigation	1,778	2,135	3,991	2,462	2,043	5,126	6,117	4,720	4,303	3,312
Regrassing	2,821	2,560	2,502	2,442	3,026	4,270	3,428	3,776	4,651	6,009
Weed & pest	1,392	1,582	1,383	1,948	1,869	1,940	2,049	2,046	1,904	1,892
Vehicles & fuel	25,153	23,726	20,049	22,926	24,851	28,739	27,432	26,732	31,024	34,090
Repairs & maintenance	12,113	10,305	9,029	10,234	11,702	12,710	11,632	16,045	14,443	14,883
Freight & general	8,892	8,661	6,782	6,600	7,871	8,008	9,305	9,605	10,761	13,909
Administration	12,063	12,413	11,778	11,542	11,785	15,718	15,081	14,212	14,732	18,194
Insurance	4,016	4,255	4,906	4,254	4,970	5,351	5,614	6,223	6,798	7,492
ACC	3,914	3,248	3,054	2,937	2,982	3,918	2,399	5,084	5,379	5,304
Rates	623	1,253	526	512	302	549	656	417	553	719
Farm working expenses	335,742	353,672	300,088	301,168	356,128	451,327	439,763	451,984	489,795	554,471
Cash operating surplus	201,958	137,419	11,433	167,540	169,323	213,273	230,372	298,298	344,252	250,934
ADJUSTMENTS (\$):										
Value of change in dairy livestock	70,394	32,000	30,838	16,893	32,946	8,193	31,018	-272	31,022	39,357
Less labour adjustment	68,733	77,508	73,553	72,041	80,608	80,071	82,559	91,240	100,776	102,774
Plus feed inventory adjustment	1,573	176	1,708	-486	1,860	2,496	-41	2,515	1,041	6,473
Less owned support block adjustment	685	1,245	695	508	251	299	479	611	1,010	860
Less depreciation	21,798	25,243	23,409	19,521	24,700	26,415	27,018	28,470	28,354	31,251
Net Adjustments	-19,249	-71,820	-65,111	-75,663	-70,753	-96,096	-79,079	-118,078	-98,077	-89,055
OPERATING CASH & NON-CASH:										
Dairy gross farm revenue	608,094	523,091	342,359	485,601	558,397	672,793	701,154	750,010	865,070	844,762
Dairy operating expenses	425,385	457,492	396,037	393,724	459,827	555,616	549,861	569,791	618,895	682,882
Dairy operating profit	182,709	65,599	-53,678	91,877	98,570	117,177	151,293	180,220	246,175	161,879

Table 13.2: Cash Operating Surplus and Operating Profit - \$ per cow

Variable	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
PHYSICAL CHARACTERISTICS										
Number of herds	114	111	109	113	108	122	124	108	87	109
Effective hectares	128	132	133	132	137	151	144	140	140	147
Peak cows milked	367	383	379	372	391	452	431	424	422	437
Stocking rate (cows/ha)	2.9	2.9	2.8	2.8	2.8	3.0	3.0	3.0	3.0	3.0
Kg milksolids sold	138,532	151,044	144,587	143,685	147,143	184,909	175,656	182,030	171,282	181,551
Milksolids sold per hectare	1,082	1,144	1,085	1,089	1,072	1,222	1,219	1,300	1,227	1,239
Milksolids sold per cow	377	394	381	386	376	410	408	429	406	416
PAYOUT RECEIVED (\$/kg MS sold)	3.76	2.88	1.88	2.82	3.21	3.17	3.45	3.65	4.54	4.14
DAIRY CASH INCOME (\$/cow):										
Milk sales (net of dairy levies)	1,419	1,134	719	1,091	1,209	1,299	1,408	1,567	1,843	1,722
Net livestock sales (sales - purchases)	37	142	94	163	129	168	139	190	125	108
Other dairy cash income	9	6	9	7	6	5	8	11	8	14
Net dairy cash income	1,465	1,282	822	1,260	1,344	1,472	1,555	1,768	1,975	1,843
CASH FARM WORKING EXPENSES (\$/cow):										
Wages	140	138	129	139	158	183	178	190	195	212
Animal health	94	92	76	84	88	96	96	102	118	120
Breeding & herd improvement	56	58	54	54	62	67	68	72	72	74
Farm dairy	18	17	17	19	19	20	22	20	21	23
Electricity	39	41	41	42	39	41	42	45	44	48
Net feed made, purchased, cropped	203	203	141	149	184	207	217	238	276	307
Stock grazing	106	131	111	92	119	134	135	125	139	153
Support block lease	4	4	6	5	4	3	7	4	2	7
Fertiliser (including Nitrogen)	56	56	49	50	54	57	63	59	70	83
Irrigation	5	6	11	7	5	11	14	11	10	8
Regrassing	8	7	7	7	8	9	8	9	11	14
Weed & pest	4	4	4	5	5	4	5	5	5	4
Vehicles & fuel	69	62	53	62	64	64	64	63	73	78
Repairs & maintenance	33	27	24	28	30	28	27	38	34	34
Freight & general	24	23	18	18	20	18	22	23	25	32
Administration	33	32	31	31	30	35	35	33	35	42
Insurance	11	11	13	11	13	12	13	15	16	17
ACC	11	8	8	8	8	9	6	12	13	12
Rates	2	3	1	1	1	1	2	1	1	2
Farm working expenses	915	923	792	810	911	1,000	1,021	1,065	1,160	1,269
Cash operating surplus	550	359	30	450	433	472	535	703	815	574
ADJUSTMENTS (\$/cow):										
Value of change in dairy livestock	192	84	81	45	84	18	72	-1	73	90
Less labour adjustment	187	202	194	194	206	177	192	215	239	235
Plus feed inventory adjustment	4	0	5	-1	5	6	0	6	2	15
Less owned support block adjustment	2	3	2	1	1	1	1	1	2	2
Less depreciation	59	66	62	52	63	59	63	67	67	72
Net Adjustments	-52	-188	-172	-203	-181	-213	-184	-278	-232	-204
OPERATING CASH & NON-CASH (\$/cow)										
Dairy gross farm revenue	1,657	1,366	903	1,305	1,428	1,490	1,627	1,767	2,049	1,934
Dairy operating expenses	1,159	1,194	1,045	1,058	1,176	1,231	1,276	1,342	1,466	1,563
Dairy operating profit	498	171	-142	247	252	260	351	425	583	371

Table 13.3: Cash Operating Surplus and Operating Profit - \$ per effective hectare

Variable	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
PHYSICAL CHARACTERISTICS										
Number of herds	114	111	109	113	108	122	124	108	87	109
Effective hectares	128	132	133	132	137	151	144	140	140	147
Peak cows milked	367	383	379	372	391	452	431	424	422	437
Stocking rate (cows/ha)	2.9	2.9	2.8	2.8	2.8	3.0	3.0	3.0	3.0	3.0
Kg milksolids sold	138,532	151,044	144,587	143,685	147,143	184,909	175,656	182,030	171,282	181,551
Milksolids sold per hectare	1,082	1,144	1,085	1,089	1,072	1,222	1,219	1,300	1,227	1,239
Milksolids sold per cow	377	394	381	386	376	410	408	429	406	416
PAYOUT RECEIVED (\$/kg MS sold)	3.76	2.88	1.88	2.82	3.21	3.17	3.45	3.65	4.54	4.14
DAIRY CASH INCOME (\$/ha):										
Milk sales (net of dairy levies)	4,069	3,291	2,043	3,073	3,445	3,876	4,210	4,751	5,574	5,132
Net livestock sales (sales - purchases)	105	412	268	459	368	502	416	575	377	320
Other dairy cash income	27	18	25	18	17	15	23	33	24	43
Net dairy cash income	4,201	3,720	2,337	3,551	3,830	4,393	4,649	5,359	5,975	5,495
CASH FARM WORKING EXPENSES (\$/ha):										
Wages	402	401	366	391	451	547	531	577	591	633
Animal health	271	268	215	237	250	286	286	308	356	357
Breeding & herd improvement	160	167	152	152	176	200	202	218	217	220
Farm dairy	52	50	50	52	55	59	65	62	62	70
Electricity	113	120	116	117	112	123	126	136	132	142
Net feed made, purchased, cropped	583	588	401	420	525	619	648	721	834	914
Stock grazing	305	380	315	258	340	401	404	380	422	455
Support block lease	10	11	17	14	12	9	20	13	6	22
Fertiliser (including Nitrogen)	159	163	140	141	154	169	189	178	211	248
Irrigation	14	16	30	19	15	34	42	34	31	23
Regrassing	22	19	19	18	22	28	24	27	33	41
Weed & pest	11	12	10	15	14	13	14	15	14	13
Vehicles & fuel	197	180	150	174	181	190	190	191	222	233
Repairs & maintenance	95	78	68	78	85	84	81	115	103	102
Freight & general	69	66	51	50	57	53	65	69	77	95
Administration	94	94	88	87	86	104	105	102	106	124
Insurance	31	32	37	32	36	35	39	44	49	51
ACC	31	25	23	22	22	26	17	36	39	36
Rates	5	9	4	4	2	4	5	3	4	5
Farm working expenses	2,623	2,679	2,251	2,282	2,596	2,983	3,051	3,229	3,509	3,783
Cash operating surplus	1,578	1,041	86	1,269	1,234	1,410	1,598	2,131	2,466	1,712
ADJUSTMENTS (\$/ha):										
Value of change in dairy livestock	550	242	231	128	240	54	215	-2	222	269
Less labour adjustment	537	587	552	546	588	529	573	652	722	701
Plus feed inventory adjustment	12	1	13	-4	14	16	0	18	7	44
Less owned support block adjustment	5	9	5	4	2	2	3	4	7	6
Less depreciation	170	191	176	148	180	175	187	203	203	213
Net Adjustments	-150	-544	-488	-573	-516	-635	-549	-843	-703	-608
OPERATING CASH & NON-CASH (\$/ha):										
Dairy gross farm revenue	4,751	3,963	2,568	3,679	4,070	4,447	4,864	5,357	6,198	5,763
Dairy operating expenses	3,323	3,466	2,971	2,983	3,352	3,673	3,815	4,070	4,434	4,659
Dairy operating profit	1,427	497	-403	696	718	775	1,050	1,287	1,764	1,104

Table 13.4: Cash Operating Surplus and Operating Profit - \$ per kg milksolids sold

Variable	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
PHYSICAL CHARACTERISTICS										
Number of herds	114	111	109	113	108	122	124	108	87	109
Effective hectares	128	132	133	132	137	151	144	140	140	147
Peak cows milked	367	383	379	372	391	452	431	424	422	437
Stocking rate (cows/ha)	2.9	2.9	2.8	2.8	2.8	3.0	3.0	3.0	3.0	3.0
Kg milksolids sold	138,532	151,044	144,587	143,685	147,143	184,909	175,656	182,030	171,282	181,551
Milksolids sold per hectare	1,082	1,144	1,085	1,089	1,072	1,222	1,219	1,300	1,227	1,239
Milksolids sold per cow	377	394	381	386	376	410	408	429	406	416
PAYOUT RECEIVED (\$/kg MS sold)	3.76	2.88	1.88	2.82	3.21	3.17	3.45	3.65	4.54	4.14
DAIRY CASH INCOME (\$/kg MS):										
Milk sales (net of dairy levies)	3.76	2.88	1.88	2.82	3.21	3.17	3.45	3.65	4.54	4.14
Net livestock sales (sales - purchases)	0.10	0.36	0.25	0.42	0.34	0.41	0.34	0.44	0.31	0.26
Other dairy cash income	0.02	0.02	0.02	0.02	0.02	0.01	0.02	0.03	0.02	0.03
Net dairy cash income	3.88	3.25	2.15	3.26	3.57	3.59	3.82	4.12	4.87	4.44
CASH FARM WORKING EXPENSES (\$/kg MS):										
Wages	0.37	0.35	0.34	0.36	0.42	0.45	0.44	0.44	0.48	0.51
Animal health	0.25	0.23	0.20	0.22	0.23	0.23	0.23	0.24	0.29	0.29
Breeding & herd improvement	0.15	0.15	0.14	0.14	0.16	0.16	0.17	0.17	0.18	0.18
Farm dairy	0.05	0.04	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.06
Electricity	0.10	0.10	0.11	0.11	0.10	0.10	0.10	0.10	0.11	0.11
Net feed made, purchased, cropped	0.54	0.51	0.37	0.39	0.49	0.51	0.53	0.55	0.68	0.74
Stock grazing	0.28	0.33	0.29	0.24	0.32	0.33	0.33	0.29	0.34	0.37
Support block lease	0.01	0.01	0.02	0.01	0.01	0.01	0.02	0.01	0.01	0.02
Fertiliser (including Nitrogen)	0.15	0.14	0.13	0.13	0.14	0.14	0.15	0.14	0.17	0.20
Irrigation	0.01	0.01	0.03	0.02	0.01	0.03	0.03	0.03	0.03	0.02
Regrassing	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.03
Weed & pest	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Vehicles & fuel	0.18	0.16	0.14	0.16	0.17	0.16	0.16	0.15	0.18	0.19
Repairs & maintenance	0.09	0.07	0.06	0.07	0.08	0.07	0.07	0.09	0.08	0.08
Freight & general	0.06	0.06	0.05	0.05	0.05	0.04	0.05	0.05	0.06	0.08
Administration	0.09	0.08	0.08	0.08	0.08	0.09	0.09	0.08	0.09	0.10
Insurance	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04
ACC	0.03	0.02	0.02	0.02	0.02	0.02	0.01	0.03	0.03	0.03
Rates	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Farm working expenses	2.42	2.34	2.08	2.10	2.42	2.44	2.50	2.48	2.86	3.05
Cash operating surplus	1.46	0.91	0.08	1.17	1.15	1.15	1.31	1.64	2.01	1.38
ADJUSTMENTS (\$/kg MS):										
Value of change in dairy livestock	0.51	0.21	0.21	0.12	0.22	0.04	0.18	0.00	0.18	0.22
Less labour adjustment	0.50	0.51	0.51	0.50	0.55	0.43	0.47	0.50	0.59	0.57
Plus feed inventory adjustment	0.01	0.00	0.01	0.00	0.01	0.01	0.00	0.01	0.01	0.04
Less owned support block adjustment	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Less depreciation	0.16	0.17	0.16	0.14	0.17	0.14	0.15	0.16	0.17	0.17
Net Adjustments	-0.14	-0.48	-0.45	-0.53	-0.48	-0.52	-0.45	-0.65	-0.57	-0.49
OPERATING CASH & NON-CASH (\$/kg MS):										
Dairy gross farm revenue	4.39	3.46	2.37	3.38	3.79	3.64	3.99	4.12	5.05	4.65
Dairy operating expenses	3.07	3.03	2.74	2.74	3.13	3.00	3.13	3.13	3.61	3.76
Dairy operating profit	1.32	0.43	-0.37	0.64	0.67	0.63	0.86	0.99	1.44	0.89

Table 13.5: Cashflow

Variable	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
PHYSICAL CHARACTERISTICS										
Number of herds	114	111	109	113	108	122	124	108	87	109
Effective hectares	128	132	133	132	137	151	144	140	140	147
Peak cows milked	367	383	379	372	391	452	431	424	422	437
Stocking rate (cows/ha)	2.9	2.9	2.8	2.8	2.8	3.0	3.0	3.0	3.0	3.0
Kg milksolids sold	138,532	151,044	144,587	143,685	147,143	184,909	175,656	182,030	171,282	181,551
Milksolids sold per hectare	1,082	1,144	1,085	1,089	1,072	1,222	1,219	1,300	1,227	1,239
Milksolids sold per cow	377	394	381	386	376	410	408	429	406	416
PAYOUT RECEIVED (\$/kg MS sold)	3.76	2.88	1.88	2.82	3.21	3.17	3.45	3.65	4.54	4.14
CASHFLOW:										
Net dairy cash income	537,700	491,091	311,521	468,708	525,451	664,600	670,136	750,282	834,048	805,405
Farm working expenses	335,742	353,672	300,088	301,168	356,128	451,327	439,763	451,984	489,795	554,471
Cash operating surplus	201,958	137,419	11,433	167,540	169,323	213,273	230,372	298,298	344,252	250,934
DISCRETIONARY CASH										
Less rent (excluding support block)	3,401	5,154	1,407	1,047	2,320	827	1,220	438	214	43
Less interest	34,599	31,805	37,949	34,629	31,626	36,976	27,516	21,389	19,725	29,384
Less tax	29,237	25,101	5,492	6,220	24,199	30,109	39,336	60,010	79,532	66,548
Plus net non-dairy cash income	2,036	2,511	2,243	1,798	1,996	2,659	-1,380	5,060	906	1,611
Plus net off-farm income	3,989	3,817	4,546	2,281	4,071	5,230	10,975	8,513	12,921	12,018
Discretionary cash	140,746	81,687	-26,626	129,723	117,245	153,250	171,895	230,034	258,608	168,587
OTHER CASH INCOME										
Plus introduced funds	13,155	24,197	26,601	12,583	14,806	-19,006	-10,255	27,709	-9,120	13,246
Plus income equalisation	-2,621	-6,091	5,707	1,412	0	470	0	596	0	-817
Cash available for living and growth	151,280	99,793	5,682	143,718	132,051	134,715	161,640	258,338	249,488	181,016
OTHER CASH EXPENDITURE										
Less net capital transactions	60,379	89,030	26,407	36,654	49,540	113,811	57,631	119,380	84,090	48,159
Less net debt	-973	-50,721	37,011	17,644	20,730	-33,643	8,192	20,070	60,025	48,487
Less net drawings	72,813	83,335	56,461	57,721	74,517	67,169	65,458	76,247	79,739	90,535
Cash surplus/deficit	19,061	-21,851	-114,197	31,699	-12,736	-12,622	41,334	51,154	38,556	5,853
CASHFLOW (\$/kg MS)										
Net dairy cash income	3.88	3.25	2.15	3.26	3.57	3.59	3.82	4.12	4.87	4.44
Farm working expenses	2.42	2.34	2.08	2.10	2.42	2.44	2.50	2.48	2.86	3.05
Cash operating surplus	1.46	0.91	0.08	1.17	1.15	1.15	1.31	1.64	2.01	1.38
DISCRETIONARY CASH (\$/kg MS)										
Less rent (excluding support block)	0.02	0.03	0.01	0.01	0.02	0.00	0.01	0.00	0.00	0.00
Less interest	0.25	0.21	0.26	0.24	0.21	0.20	0.16	0.12	0.12	0.16
Less tax	0.21	0.17	0.04	0.04	0.16	0.16	0.22	0.33	0.46	0.37
Plus net non-dairy cash income	0.01	0.02	0.02	0.01	0.01	0.01	-0.01	0.03	0.01	0.01
Plus net off-farm income	0.03	0.03	0.03	0.02	0.03	0.03	0.06	0.05	0.08	0.07
Discretionary cash	1.02	0.54	-0.18	0.90	0.80	0.83	0.98	1.26	1.51	0.93
OTHER CASH INCOME (\$/kg MS)										
Plus introduced funds	0.09	0.16	0.18	0.09	0.10	-0.10	-0.06	0.15	-0.05	0.07
Plus income equalisation	-0.02	-0.04	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Cash available for living and growth	1.09	0.66	0.04	1.00	0.90	0.73	0.92	1.42	1.46	1.00
OTHER CASH EXPENDITURE (\$/kg MS)										
Less net capital transactions	0.44	0.59	0.18	0.26	0.34	0.62	0.33	0.66	0.49	0.27
Less net debt	-0.01	-0.34	0.26	0.12	0.14	-0.18	0.05	0.11	0.35	0.27
Less net drawings	0.53	0.55	0.39	0.40	0.51	0.36	0.37	0.42	0.47	0.50
Cash surplus/deficit	0.14	-0.14	-0.79	0.22	-0.09	-0.07	0.24	0.28	0.23	0.03

Table 13.6: Capital Structure and Wealth Creation

Variable	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
PHYSICAL CHARACTERISTICS										
Number of herds	114	111	109	113	108	122	124	108	87	109
Effective hectares	128	132	133	132	137	151	144	140	140	147
Peak cows milked	367	383	379	372	391	452	431	424	422	437
Stocking rate (cows/ha)	2.9	2.9	2.8	2.8	2.8	3.0	3.0	3.0	3.0	3.0
Kg milksolids sold	138,532	151,044	144,587	143,685	147,143	184,909	175,656	182,030	171,282	181,551
Milksolids sold per hectare	1,082	1,144	1,085	1,089	1,072	1,222	1,219	1,300	1,227	1,239
Milksolids sold per cow	377	394	381	386	376	410	408	429	406	416
PAYOUT RECEIVED (\$/kg MS sold)	3.76	2.88	1.88	2.82	3.21	3.17	3.45	3.65	4.54	4.14
DAIRY ASSETS AT OPEN										
Land & buildings	15,098	30,040	11,402	18,684	11,326	4,691	12,128	27,005	39,147	35,597
Plant, machinery and vehicles	108,099	126,212	125,820	117,301	128,521	140,793	137,363	150,045	143,249	158,672
Livestock	763,980	845,693	691,128	569,288	691,303	790,098	731,432	748,526	720,584	818,784
Investments (excluding non-dairy)	9,835	14,950	7,629	15,904	7,852	5,442	15,611	16,788	14,974	13,171
Current assets	82,670	138,435	103,524	46,993	95,392	116,653	93,939	134,284	148,911	162,320
Total dairy assets at open	979,682	1,155,330	939,503	768,170	934,394	1,057,677	990,474	1,076,649	1,066,865	1,188,545
Plus non-dairy assets	148,952	126,234	152,207	195,254	136,930	177,130	298,734	226,427	237,755	218,114
Total assets	1,128,634	1,281,564	1,091,710	963,424	1,071,324	1,234,807	1,289,208	1,303,076	1,304,621	1,406,659
LIABILITIES AT OPEN										
Term liabilities	513,263	456,746	552,001	599,319	581,994	665,150	569,206	549,938	517,017	464,500
Current liabilities	97,513	88,015	95,703	89,844	73,944	107,777	104,477	102,998	79,044	106,047
Total liabilities	610,776	544,761	647,704	689,163	655,938	772,928	673,683	652,936	596,061	570,546
Owners equity at open	517,858	736,803	444,006	274,261	415,386	461,880	615,525	650,141	708,560	836,113
DAIRY ASSETS AT CLOSE										
Land & buildings	15,631	45,015	10,361	19,483	11,326	14,637	31,423	54,315	39,268	35,445
Plant, machinery and vehicles	132,115	126,025	121,846	125,203	140,605	141,864	142,025	163,965	167,274	174,913
Livestock	870,676	731,576	594,679	734,331	667,438	787,504	766,899	752,807	837,179	819,653
Investments (excluding non-dairy)	11,543	17,568	7,796	23,409	8,439	10,920	16,278	17,935	15,121	15,960
Current assets	115,486	114,664	87,303	69,448	98,324	92,277	112,605	161,046	195,556	153,504
Total dairy assets at close	1,145,451	1,034,848	821,985	971,874	926,132	1,047,203	1,069,230	1,150,067	1,254,398	1,199,475
Plus Non-dairy assets	165,597	172,672	163,079	203,511	146,603	245,321	298,988	272,411	272,055	217,823
Total assets	1,311,048	1,207,520	985,064	1,175,385	1,072,735	1,292,524	1,368,218	1,422,479	1,526,452	1,417,298
LIABILITIES AT CLOSE										
Term liabilities	514,236	507,467	589,012	581,675	561,264	698,793	561,014	529,868	456,992	416,013
Current liabilities	111,268	86,095	119,657	80,600	89,612	97,455	94,284	86,486	100,252	102,975
Total liabilities	625,504	593,562	708,669	662,275	650,876	796,248	655,298	616,353	557,244	518,988
Owners equity at close	685,544	613,958	276,395	513,110	421,859	496,276	712,919	806,125	969,209	898,310
EQUITY										
Growth in equity	167,686	-122,845	-167,611	238,849	6,473	34,397	97,394	155,984	260,649	62,197
Growth in equity from profit	118,099	4,979	-73,991	69,859	53,694	70,311	112,985	127,784	182,517	93,657
Growth in equity from capital	49,587	-127,824	-93,620	168,990	-47,221	-35,914	-15,536	28,259	78,156	-31,445
Growth in equity %	32.4	-16.7	-37.7	87.1	1.6	7.4	15.8	24.0	36.8	7.4
Closing debt to asset %	42.7	43.8	69.2	53.6	56.7	61.6	47.9	43.3	36.5	36.6
Closing term liabilities per kg MS	3.71	3.36	4.07	4.05	3.81	3.78	3.19	2.91	2.67	2.29

Table 13.7: Returns

Variable	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23
PHYSICAL CHARACTERISTICS										
Number of herds	114	111	109	113	108	122	124	108	87	109
Effective hectares	128	132	133	132	137	151	144	140	140	147
Peak cows milked	367	383	379	372	391	452	431	424	422	437
Stocking rate (cows/ha)	2.9	2.9	2.8	2.8	2.8	3.0	3.0	3.0	3.0	3.0
Kg milksolids sold	138,532	151,044	144,587	143,685	147,143	184,909	175,656	182,030	171,282	181,551
Milksolids sold per hectare	1,082	1,144	1,085	1,089	1,072	1,222	1,219	1,300	1,227	1,239
Milksolids sold per cow	377	394	381	386	376	410	408	429	406	416
PAYOUT RECEIVED (\$/kg MS sold)	3.76	2.88	1.88	2.82	3.21	3.17	3.45	3.65	4.54	4.14
RETURN ON DAIRY ASSETS %										
Dairy operating profit	182,709	65,599	-53,678	91,877	98,570	117,177	151,293	180,220	246,175	161,879
Plus owned support block adjustment	685	1,245	695	508	251	299	479	611	1,010	860
Less rent	3,401	5,154	1,407	1,047	2,320	827	1,220	438	214	43
Net return from dairy	179,993	61,690	-54,390	91,338	96,501	116,649	150,552	180,393	246,971	162,696
Total dairy assets (less current) at open	897,012	1,016,895	835,979	721,177	839,002	941,025	896,535	942,365	917,954	1,026,224
Operating return on dairy assets %	20.1	6.1	-6.5	12.7	11.5	12.4	16.8	19.1	26.9	15.9
TOTAL RETURN ON ASSETS %										
Net return from dairy	179,993	61,690	-54,390	91,338	96,501	116,649	150,552	180,393	246,971	162,696
Plus net non-dairy profit	2,052	2,671	2,203	2,387	2,758	2,615	1,209	5,284	844	2,636
Plus change in capital value	18,825	-171,303	-147,670	135,959	-84,007	82,092	-31,459	-27,117	60,109	-69,170
Total return	200,870	-106,942	-199,857	229,684	15,252	201,356	120,302	158,560	307,924	96,163
Total assets (less current) at open	1,045,964	1,143,129	988,186	916,431	975,932	1,118,155	1,289,208	1,303,076	1,304,621	1,406,659
Total return on assets %	19.2	-9.4	-20.2	25.1	1.6	18.0	9.3	12.2	23.6	6.8
TOTAL RETURN ON EQUITY %										
Total return	200,870	-106,942	-199,857	229,684	15,252	201,356	120,302	158,560	307,924	96,163
Plus net off-farm income	3,989	3,817	4,546	2,281	4,071	5,230	10,975	8,513	12,921	12,018
Less interest	34,599	31,805	37,949	34,629	31,626	36,976	27,516	21,389	19,725	29,384
Total return for equity	170,239	-134,838	-233,264	197,355	-12,206	169,610	103,761	145,684	301,120	78,796
Equity at open	517,858	736,803	444,006	274,261	415,386	461,880	615,525	650,141	708,560	836,113
Total return on equity %	32.9	-18.3	-52.5	72.0	-2.9	36.7	16.9	22.4	42.5	9.4

