

Supply Number: 37581

Farm Insights Report

2021/2022



The
Co-operative
Difference



Dairy for life

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A message from Rich



I hope the season has started well. We know it's important for you to have access to great information to support your farming business, so we've made some improvements to the report this year to help you understand how your farm is performing relative to your peers so you can identify opportunities to improve on-farm efficiency.

Some of the key changes:

- New section on farm system optimisation focusing on nitrogen fertiliser conversion efficiency.
- Expanded greenhouse gas emissions section to include non-biological emission sources.
- Further refined insights in the heat stress and milking efficiency sections.

As you'll see, the report contains a lot of information including some potential opportunities for improvements. There's a lot to take in, so I'd encourage you to get in touch with the Farm Source team, or your rural professional, to support you if required.

Hope the rest of the season goes well, catch up soon.

Noho ora mai,

Richard Allen
Group Director, Farm Source

The information and insights provided to you in this report are sourced from information that you have provided through your Farm Dairy Records, together with milk quality and production data that we hold and third party industry research. While the information and insights provided may identify risks and opportunities, such information is general information only and is not in the nature of advice. We make no representations or warranties (whether express or implied) as to whether information or data provided in this report is accurate, reliable or complete. You are solely responsible for your own assessment and evaluation of the information and for the actions or decisions you take in reliance on the information or data generated. Accordingly, Fonterra shall not be liable for any loss arising from any actions or decisions taken by you in reliance on the information contained in this report.



Introduction

This report uses the information that you provide in your Farm Dairy Records, together with milk quality and production data that the Co-op holds, to provide useful insights into what is happening on your dairy farm. The metrics included in this report highlight risks and opportunities that may exist in your farming system, helping you to improve your efficiency and reduce your impact.

Improving your farm's efficiency can not only have benefits for your individual farm business, but collectively supports our strategy to maintain a sustainable milk supply.



Your Farm's Key Information	Units	2019/2020	2020/2021	2021/2022
Dairy farm effective area	ha	160.0	160.0	160.0
Peak cows (maximum cow numbers)	cows	555	558	558
Stocking rate (milking cows)	cows/ha	3.5	3.5	3.5
Production (milk solids produced)	kgMS	280,122	280,381	258,851
Production per cow	kgMS/cow	505	502	464
Production per hectare	kgMS/ha	1,751	1,752	1,618
Average somatic cell count	cells/ml	110,834	117,358	142,485
Nitrogen fertiliser applied per hectare	kgN/ha	169	133	144
Imported supplementary feed fed	tDM	244	262	418
Imported supplementary feed fed per cow	tDM/cow	0.4	0.5	0.7
Purchased Nitrogen Surplus	kgN/ha	69	36	73
Biological Greenhouse Gas Emissions per hectare	kgCO ₂ e/ha	14,469	14,390	13,938

Previous seasons data will be shown where data is available and farm ownership hasn't changed.



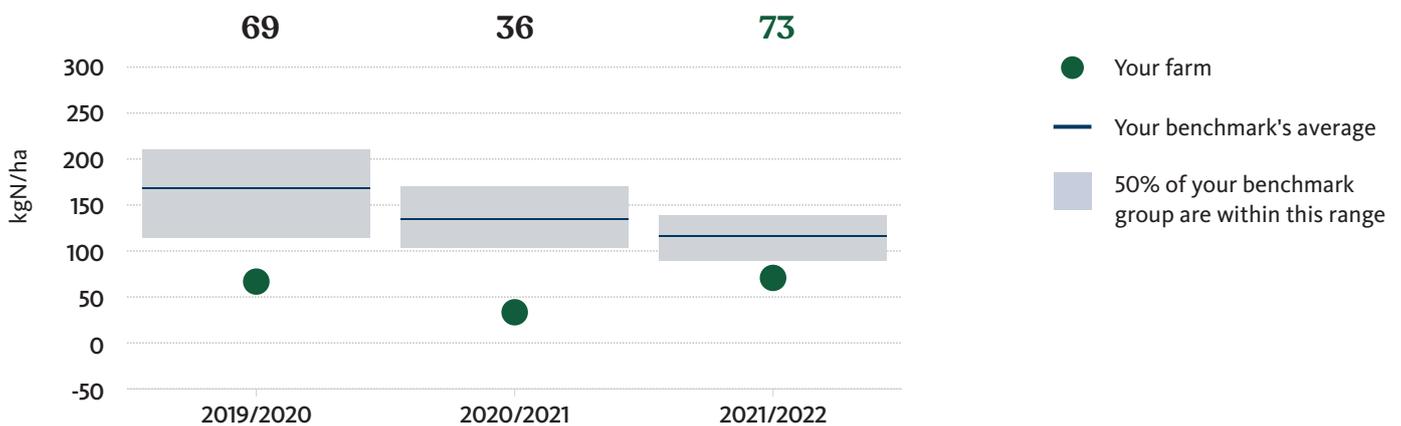
Environment

Your farm's environmental insights are broken down into Purchased Nitrogen Surplus, Nitrogen Risk Scorecard, Nitrogen Fertiliser Conversion Efficiency and Greenhouse Gas Emissions.

Purchased Nitrogen Surplus

Purchased Nitrogen Surplus is the difference between the nitrogen inputs (fertiliser and imported feeds) and the nitrogen outputs (milk, meat, crop, supplementary feed or exported effluent) on your dairy farm effective area. A high number means more nitrogen is at risk of being lost from your farm to the receiving environment.

Your Farm's Purchased Nitrogen Surplus Per Hectare



Your farm is benchmarked against other farms in the Canterbury region with production **between 1401-1700 kgMS/ha.**

Your Farm's Nitrogen Risk Scorecard

Stock Management	VERY HIGH	Cropping and Cultivation	VERY LOW
Nitrogen Fertiliser	VERY LOW	Effluent Management	VERY LOW
Imported Feed	VERY LOW	Irrigation	LOW

Your Farm's Nitrogen Risks

STOCK MANAGEMENT



Stocking Rate

The higher the stocking rate⁽¹⁾ (peak), the greater the nitrogen loss.

Total 27.9 su/ha

Milking herd (3.5 cows/ha) 27.9 su/ha

Replacement/other animals 0.0 su/ha

Dry Matter Eaten

The more dry matter eaten⁽²⁾ per hectare, the more nitrogen ingested by the animal and returned to pasture as dung and urine.

Total 19.3 tDM/ha

Grown on this farm

Pasture and crops 15.7 tDM/ha

Imported to this farm

Pasture and crops⁽³⁾ 3.6 tDM/ha

All other feeds 0.0 tDM/ha

Wintering Off/Culling

Reducing the number of animals on farm (from peak numbers) by culling and/or wintering off (May-Aug) will reduce the nitrogen loss risk on your dairy farm effective area.

51% off platform

Winter Practices

Reducing the amount of time cows spend on pasture and/or crops over winter will reduce the nitrogen loss risk.

Off pasture facility 0%

On pasture 100%

Break fed fodder crop 0%

NITROGEN FERTILISER



Nitrogen Fertiliser Applications

The more nitrogen fertiliser applied, the higher the nitrogen loss risk.

144 kgN/ha

Milk Solids per kg Nitrogen Used

Using less Nitrogen fertiliser (all other inputs being equal) whilst maintaining production, will lower purchased nitrogen surplus.

11 kgMS/kgN

Timing of Application

Fertiliser applied during the winter months can increase the chance of nitrogen being lost.

Sept - Apr

Jul - Aug

May - Jun

Highest Application Rate

Lower application rates reduce the nitrogen loss risk.

Below 25 kgN/ha

Above 25 kgN/ha

Feed Budget

Using a feed budget or wedge to help plan strategic fertiliser applications is a good farming practice.

No feed budget used

Feed budget used

IMPORTED FEED



Nitrogen Imported From Feed

The greater the amount of imported feed, the more nitrogen that enters the system.

42 kgN/ha imported

Nitrogen Content

The greater the average nitrogen content, the higher the amount of nitrogen that enters the system.

Average N content of 1.60%

Nitrogen Use Efficiency of Imported Supplements

The greater the conversion efficiency, the lower the nitrogen surplus available to be lost.

39 kgMS/kgN

⁽¹⁾ Stock Units (su) are a means of calculating stock numbers between species, breeds, and age groups based on relative feed demand. As an example 23.9su is equivalent to approximately 3 cows/ha (Friesian/Jersey cross) or 1500kg liveweight per hectare.

⁽²⁾ Energy model calculations based upon the DairyBase model developed by DairyNZ.

⁽³⁾ Includes feed fed to stock grazed off the dairy farm effective area.

Your Farm's Nitrogen Risks Continued...

CROPPING AND CULTIVATION



Conventional

This is the greatest risk method for sowing a crop and the risk increases as the cultivated area increases.

Not Applicable

Minimum Tillage

This is a lower risk activity than conventional cultivation, however the risk increases with the total area cultivated.

Not Applicable

Direct Drill

This is a lower risk activity than both full cultivation and minimum tillage for establishing a crop.

Not Applicable

Season of Harvest/Grazing

Crops harvested/grazed during winter pose a higher risk to nitrogen leaching.

Not Applicable

Timing of Fertiliser Application

There is greater risk if fertiliser is applied to crops during high risk months of May, June, July and August.

Not Applicable

EFFLUENT MANAGEMENT



Effluent Discharge Method

Discharging treated effluent to land is the lowest risk.

Irrigate to pasture

Irrigate to pasture (low storage)

Discharge to water

Discharge to water and pasture

Effluent Irrigation Area

An undersized effluent area can result in the average amount of nitrogen per hectare applied exceeding local rules and regulations.

5ha/100 cows

Application Depth

Low rates will ensure greater flexibility of management with more irrigation days available and increase the chance of the plant utilising the nutrients within the effluent rather than it being lost.

< 12mm application depth

IRRIGATION



Irrigation Method

Irrigation generally increases the nitrogen loss risk due to the potential for over irrigating to induce drainage events. Some systems are inherently riskier than others irrespective of management.

Pivot or linear	88%
Rotary boom, gun or k-line	12%
Border dyke	0%

Irrigation Scheduling

Deciding when to start or stop irrigation is important as poor management of an irrigation event can lead to induced drainage.

Soil moisture monitoring/ water budget	100%
Visual assessment/when water is available	0%

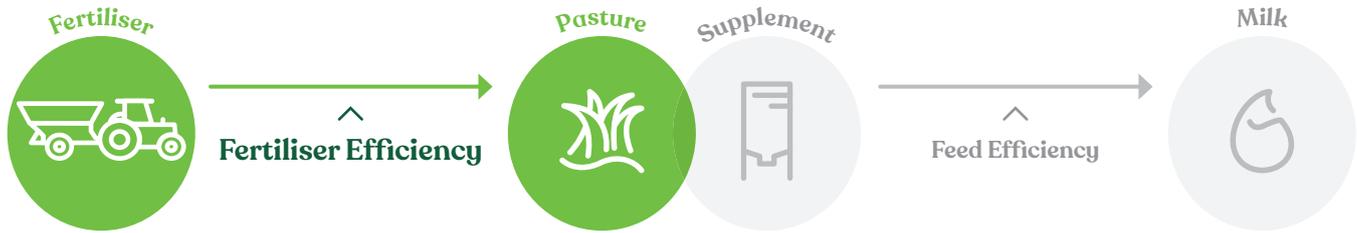
Irrigation Application Method

Having control over the amount and how often water is applied can greatly influence nitrogen loss risk with poor management of irrigation events leading to induced drainage.

Variable rate irrigation	0%
Deficit irrigation	100%
Fixed depth and return	0%

Farm System Optimisation

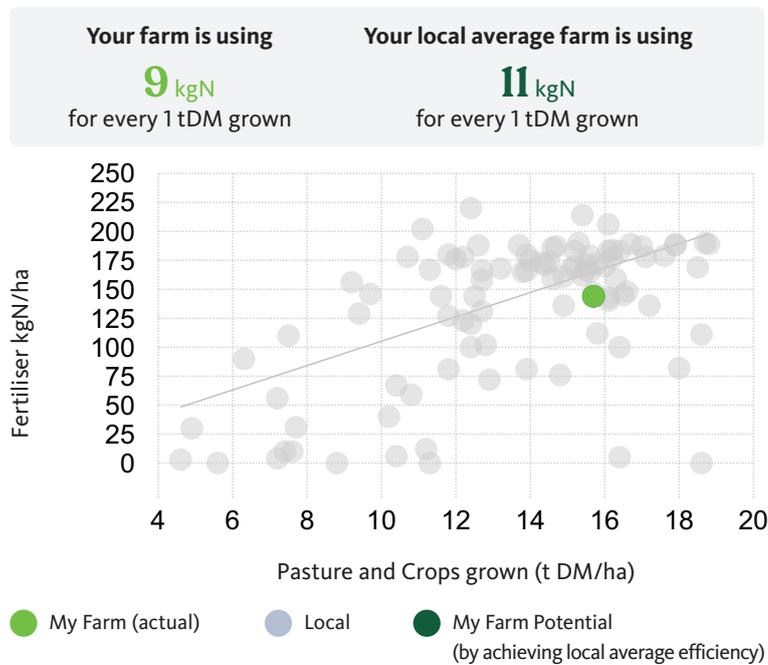
Optimising your current farm system means making the most of the factors within your control. The benchmarking below provides an indication of how others in your local area* are performing. Understanding how you utilise nitrogen fertiliser to supplement pasture growth is our first step in helping you to improve the efficiency of your farming system.



Your Farm's Nitrogen Fertiliser Conversion Efficiency

This data compares your farm's nitrogen fertiliser conversion efficiency against farms in your local area. If an opportunity to **grow the same amount of pasture from less nitrogen fertiliser** looks possible, then the benefits will be estimated.

How does your farm compare?



*Local as defined as the 100 closest farms to your location (radius 30kms).

You are achieving above average efficiency

Further improving efficiency by using less nitrogen fertiliser for the same yield could reduce:

- Purchased Nitrogen Surplus
- GHG Emissions
- Annual spend on nitrogen fertiliser

Further advice should be sought if you would like to explore factors influencing efficiency of your farm system.

Support and Next Steps

There are many factors that influence nitrogen fertiliser conversion efficiency and before you make any decisions, it is recommended that you seek further advice from your **Sustainable Dairying Advisor** or a suitably qualified person to complete:

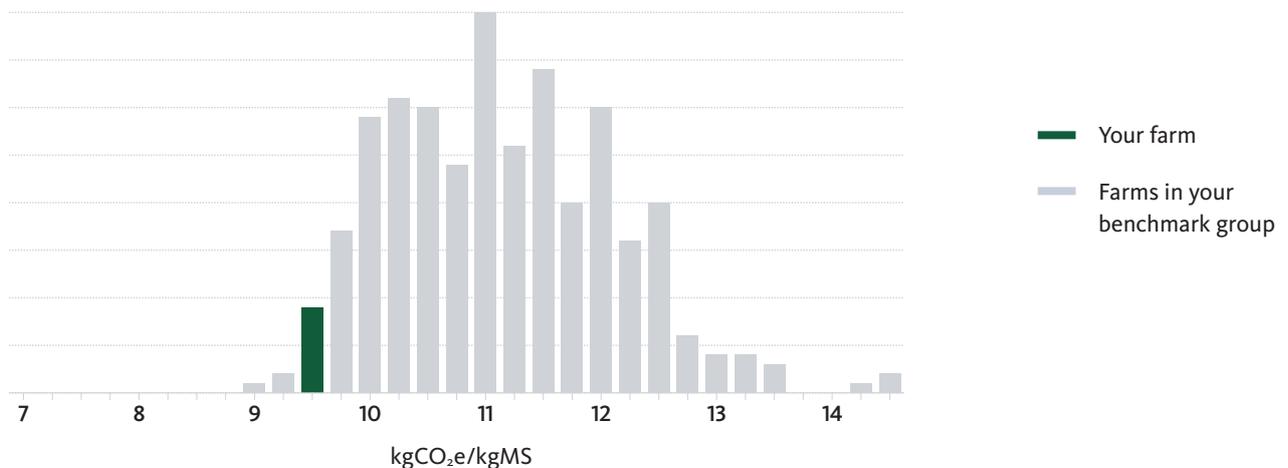
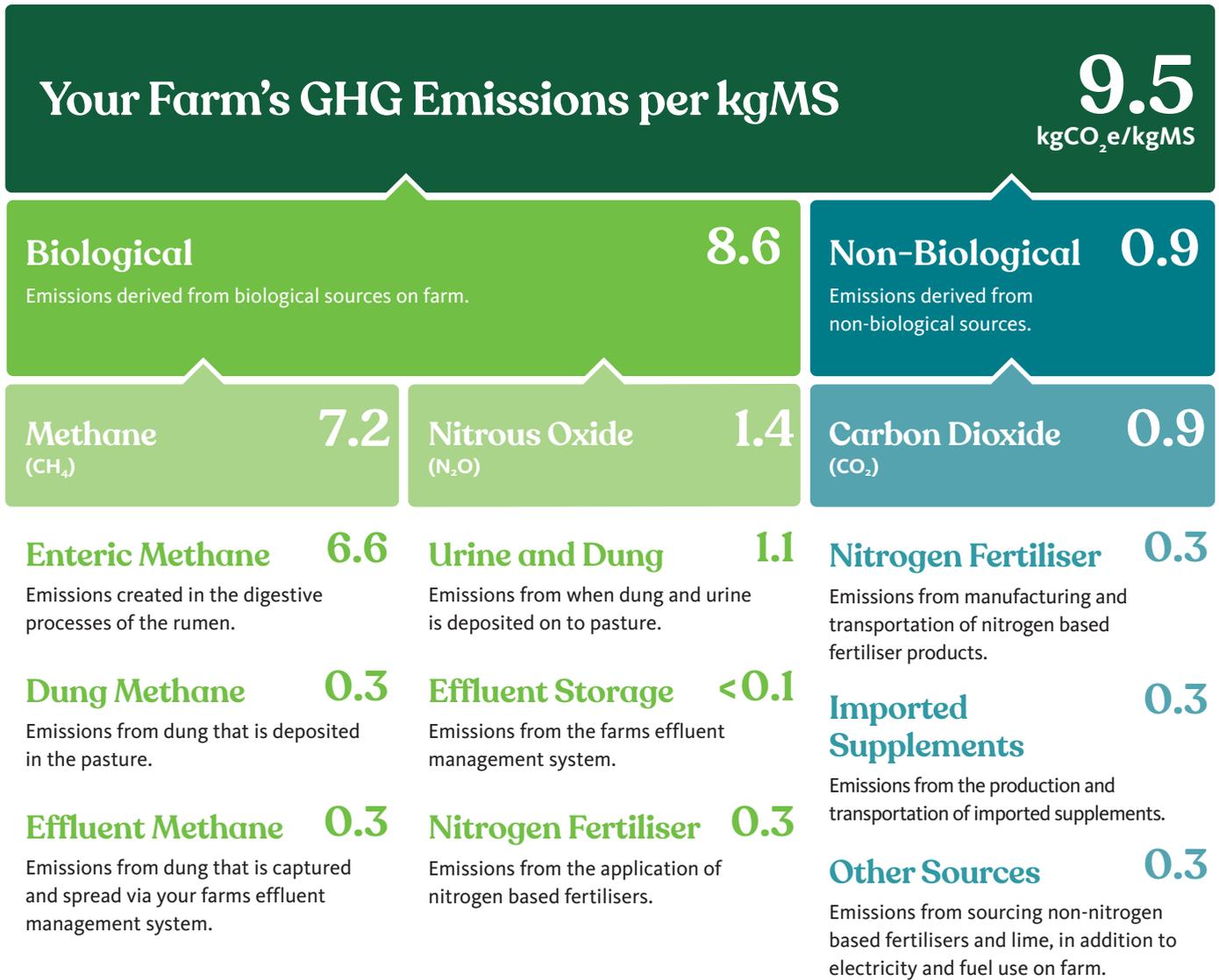
- An assessment on-farm of potential contributing factors
- Prioritise focus areas for improvement
- Further modelling to assess impacts

Examples of factors influencing nitrogen fertiliser conversion efficiency

 Fertiliser	 Pasture
 Effluent	 Irrigation
 Cropping	 Soil

Greenhouse Gas Emissions

Your farm's greenhouse gas (GHG) footprint consists of both **Biological** and **Non-Biological** sources of emissions. The Greenhouse Gas Emissions in this report accounts for practices on your dairy farm effective area. Your biological emissions are what we have reported in previous years and are covered on the next page.

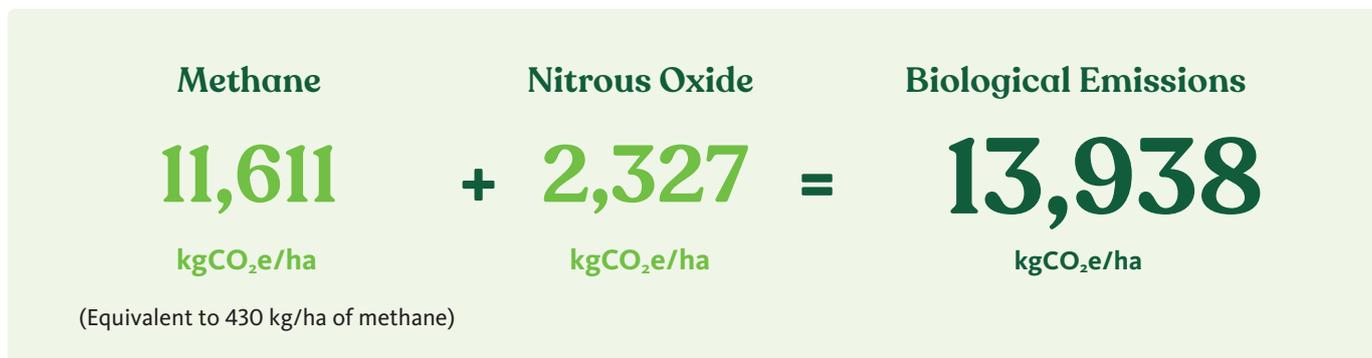


Your farm is benchmarked against other farms in the Canterbury with production **between 1401-1700 kgMS/ha**

Your Biological Emissions were calculated using the Agriculture Inventory Model (AIM), which was developed by Ministry for Primary Industries. All Non-Biological emissions in this report have been calculated using regional averages and the emissions factors in accordance with NZ GHG Inventory and the AgResearch LCA model.

Your Farm's Biological GHG Emissions per Hectare

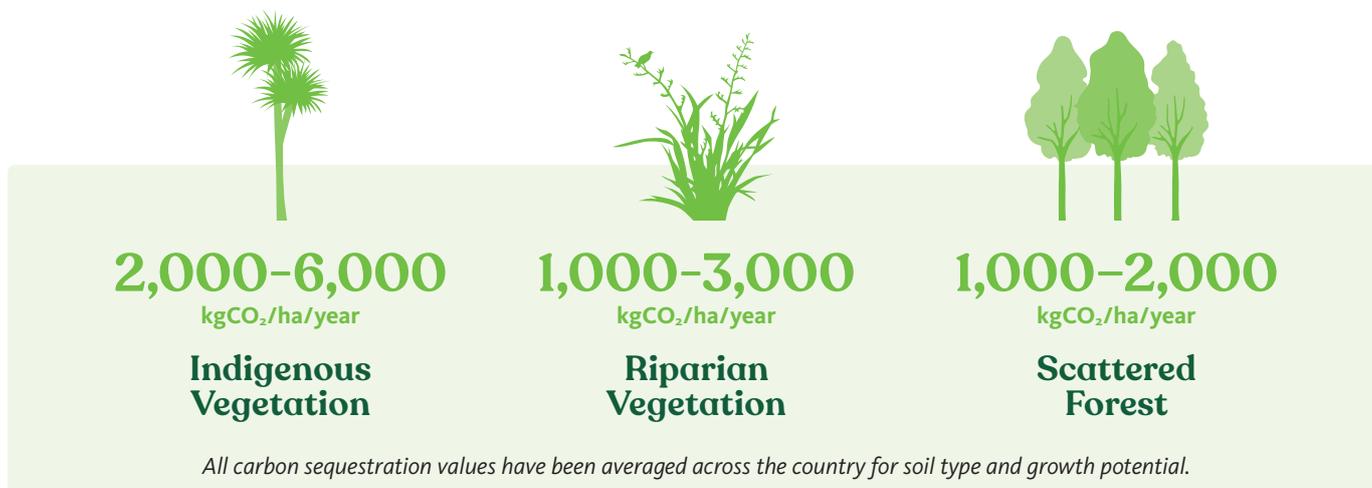
This section shows estimates of your farm's **biological** GHG emissions for your dairy farm effective area. Your biological emissions consist of methane and nitrous oxide gases. A GHG Emissions assessment for your total farm area is available on the Farm Source Business website under Digital Farm Insights (if your Farm Dairy Records Submission included additional information relating to animals and practices on your support land). For the link to this website, please go to the reference guide at the back of this report.



Your farm is benchmarked against other farms in Canterbury with production **between 1401-1700 kgMS/ha**.

Trees on Farm

In the future farmers may be recognised for their ability to sequester carbon from some types of on-farm vegetation. As a guideline the information below is approximately how much carbon will be removed from the atmosphere from 1 ha of on-farm vegetation that meets the criteria.



For more information

Information relating to agriculture, climate change, and carbon sequestration is available on the He Waka Eke Noa and AgMatters websites. For links to these websites, please go to the reference guide at the back of this report.



Milk

This section of the report provides key insights into potential savings and opportunities for your farm. These insights have been provided using tools and calculators that have been tested and developed through industry research.

Somatic Cell Count

Mastitis is usually caused by bacteria, which enter through the teat canal and infect the udder. Effective mastitis prevention will ensure more milk in the vat, higher quality milk, less use of antibiotics and more time saved on farm. If your bulk somatic cell count (SCC) is greater than 100,000 cells/ml this indicates some cases of sub-clinical infection are present with the potential to impact milk production.

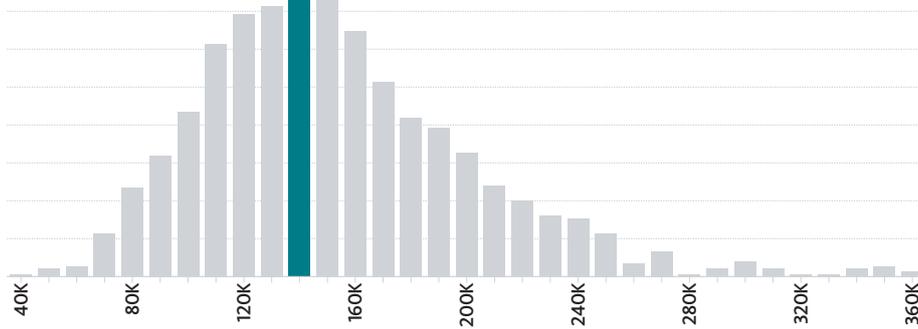
Research has shown there is a 2.1% loss in production for every doubling of somatic cell count over 100,000 cells/ml.

Potential Benefit

\$25,800

By reducing your cell count to 100,000 cells/ml there is the potential to increase production on your farm that could be worth up to \$25,800. This does not include the cost of treatment or culling and is based off a milk price of \$9.30.

Your Farm's Annual Average Somatic Cell Count 2021/2022



142,485

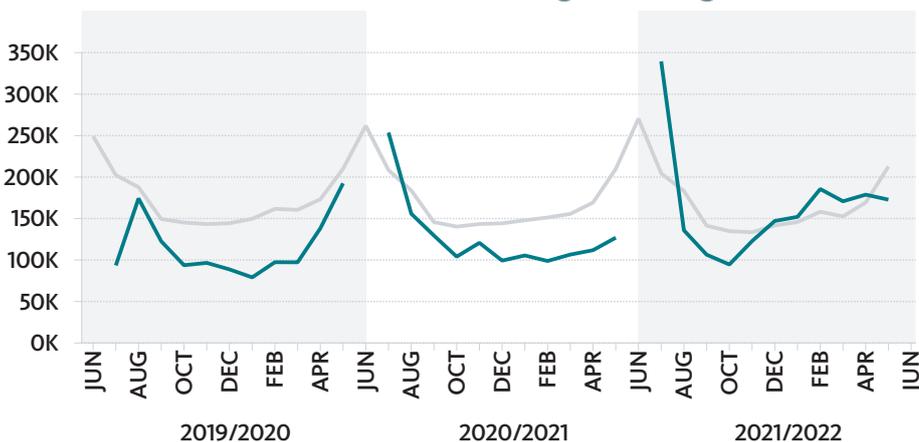
cells/ml

- Your farm
- Farms in your benchmark group

Your farm is benchmarked against other farms in your region. This placed you in the top 50% of suppliers in the Canterbury Region for the 2021/2022 season.



Your Farm's Historical Monthly Average Somatic Cell Count



Your farm is benchmarked against other farms in your region.

- Your farm
- Farms in your benchmark group

Previous season's trends will be shown for up to three seasons where data is available and farm ownership hasn't changed.

Milking Efficiency

More efficient milking leads to better outcomes for people, cows and farm profitability. Simple changes that save seconds per cow can quickly add up to minutes saved per milking, and hours saved per day.

This section of the report uses milk vat monitoring data for your month of peak production to benchmark your milking efficiency. It uses DairyNZ research to provide an estimate of the amount of time that could be saved by changing the way your dairy is operated.

Your Farm's Peak Milk Production Data

Shed Type	50 bail rotary
Herd Size	557 cows
Peak Month	October
Peak Volume	12,169 L/day
Milking Frequency	3 in 2 (10-18-20 h interval between milkings)

Milking*	Times	Volume
1	05:00 to 08:00	18
2	15:00 to 17:15	9
3	05:00 to 08:00	16
Total	4 hours/day	22 L/cow

*Milking is defined as the start of milk flow to the end of milk flow into the vat

We Estimate You Could Save

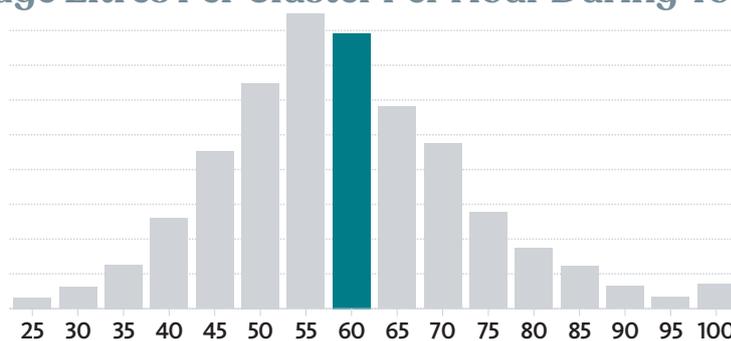
6 to 11 hours

per week

This estimate is based on your farm reaching 80-100% of its potential milking efficiency using the maximum milking time (MaxT) strategy.

The insights in this section will not be accurate if you have a split calving herd or if part of the herd is being milked OAD. For more detailed information please use the Dairy NZ Milksmart App or visit the website found in the reference guide at the back of this report.

Average Litres Per Cluster Per Hour During Your Peak Month



59

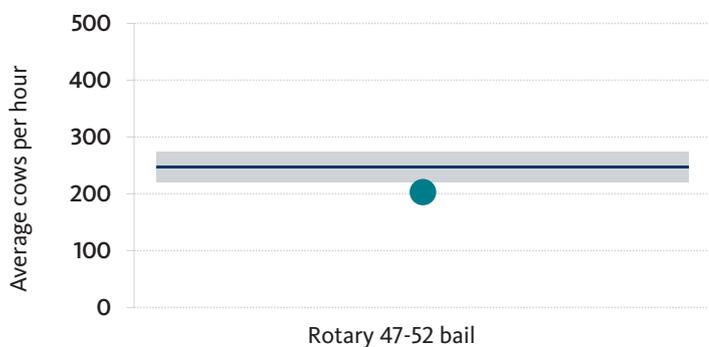
L/cluster/hour

- Your farm
- All Fonterra Farms

This benchmark allows a fair comparison of all dairy types, sizes and production levels.

For context, if your cows average milk flow rate is 2 L/min, then the maximum potential would be 120 L per cluster per hour (2 L/min × 60 min).

Average Cows Milked Per Hour During Your Peak Month



203

Cows/hour

- Your farm
- Your benchmark's average
- 50% of your benchmark group are within this range

This benchmark is influenced by the number of clusters in the dairy and the herd's level of production. Therefore, you are benchmarked against similar sized dairies nationally.

Support and Next Steps

Contact your field team representative or the Service Centre on 0800 65 65 68 for a Milk Quality Improvement visit or Milking Efficiency visit with your [Regional Food Safety and Assurance Manager](#).



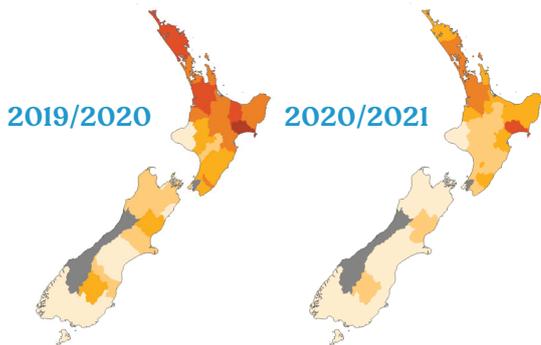
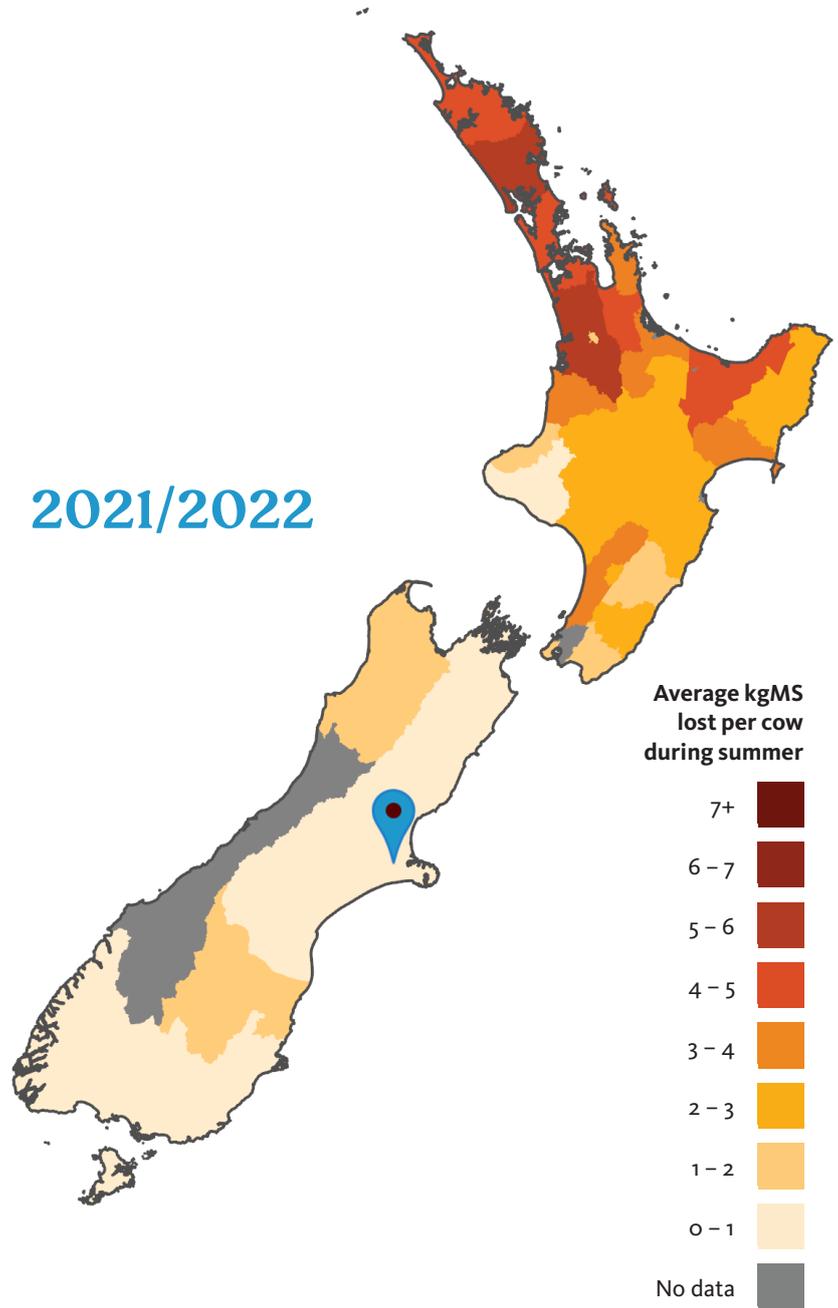
Animals

Heat Stress

The heat generated by rumen fermentation means that cattle are more tolerant to cold conditions than humans, but it also makes them more likely to get too hot. Cows that are too hot will seek shade, drink more, and their appetite and rumination times will reduce, depressing production. Severe heat stress can also have impacts on reproductive performance.

New Zealand research (AgResearch and DairyNZ) has shown that milk production decreases relative to increasing temperature and humidity. Combining this research with actual and modeled weather data supplied by NIWA for your farm location, along with your herd size and breed, we have calculated the impact of unmitigated heat stress for your farm.

2021/2022



Farm Details

Herd size	558
Predominant breed	Friesian x Jersey
Nearest virtual climate station	2.6 kms

Estimated Impact of Heat Stress For Your Farm

\$1,800
per year

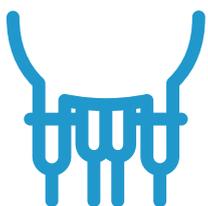
Lost revenue indicated above (predicted production loss @\$9.30/kgMS) is based on the 2021/2022 weather data from your nearest virtual weather climate station. The table also shows predicted loss (kgMS) for the three most recent seasons.

To find out more in depth information about the impact heat stress can have on your herd visit the DairyNZ website. For the link to this website, please go to the reference guide at the back of this report.

	Above Threshold	Predicted Loss
2019/2020	29 Days	522 KgMS
2020/2021	28 Days	423 KgMS
2021/2022	21 Days	190 KgMS

Estimates based on a collaborative NZ Bioeconomy in the Digital Age project between AgResearch, DairyNZ, NIWA and Fonterra funded by NZ taxpayers and milk solids levy payers through the Strategic Science Investment Fund and DairyNZ Inc. In preparing NIWA VCSN data for this insight, all reasonable skill and care was exercised and the best available data and methods were used. NIWA accepts no liability for any loss or damage (whether direct or indirect) incurred by any person through the use of or reliance on this information.

Mastitis



Mastitis is painful for the affected animal, takes time and money to treat, and can have long term impacts on production, reproduction, and cell count. Most antibiotics used in dairy farming are for the control of mastitis, and reducing cases will reduce the risk of development of antibiotic resistant bacteria.

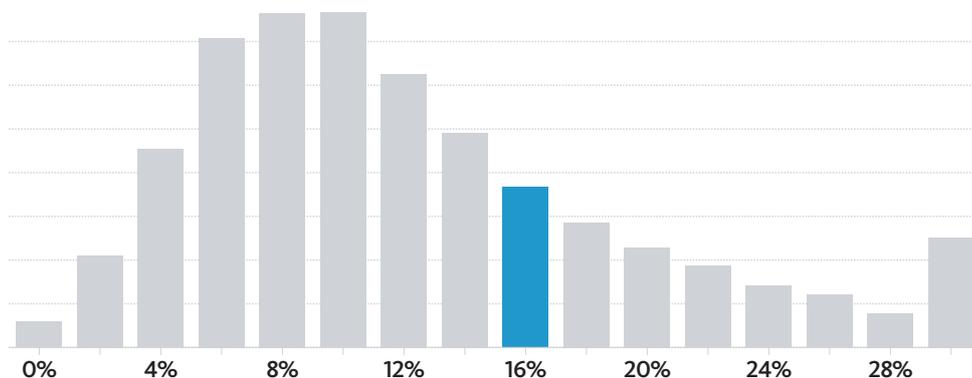
Estimated Impact of Mastitis For Your Farm

\$13,200

per year

This is based on the 88 cases of clinical mastitis reported in your Farm Diary Records, multiplied by \$150. This represents the average cost of treatment and withheld milk, but doesn't cover the longer term costs such as reduced production or increased culling risk. A more detailed calculator is available from DairyNZ. The link for this calculator can be found in the reference guide at the back of this report.

2021/2022 Mastitis Cases as % of Peak Cows



16%

Annual mastitis rate

— Your farm

— All Fonterra Farms

Lameness



As well as being painful for animals, lameness can add considerable cost to a farming operation with impacts on milk production, reproduction and staff time.

Management decisions have a huge influence on lameness rates, and DairyNZ have created a great guide called Preventing and Managing Lameness, that has some simple actions farmers can take to assess and improve the situation on their farm.

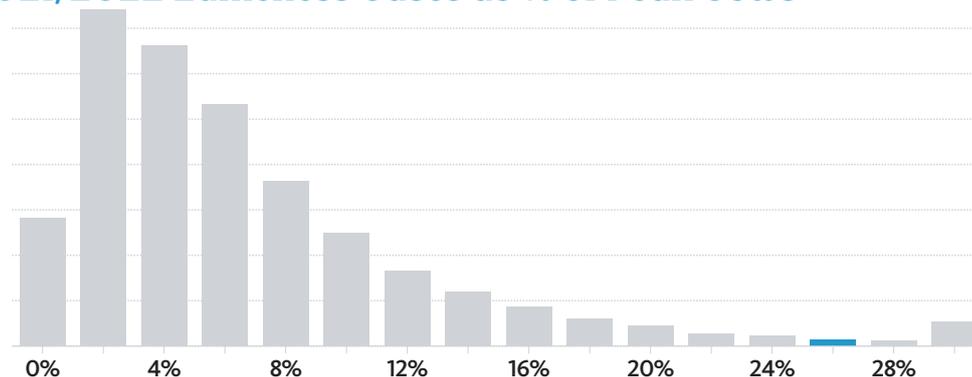
Estimated Cost of Lameness For Your Farm

\$36,750

per year

The base cost to treat and withhold a lame cow is thought to be around \$250 per case. The figure above is calculated for the 147 lame cows you diagnosed or treated last season. DairyNZ have developed a calculator that takes into account the additional costs due to lost reproductive performance and increased culling risk. The link for this calculator can be found in the reference guide at the back of this report.

2021/2022 Lameness Cases as % of Peak Cows



26%

Annual lameness rate

— Your farm

— All Fonterra Farms

Reference Guide

Environment



He Waka Eke Noa
www.hewakaekenoa.nz 9



AgMatters
www.agmatters.nz 9



Farm Source Website - Farm Insights
fonterra.nzfarmsource.co.nz/fs/s/farm-insights 9

Milk



Milking Efficiency
www.dairynz.co.nz/milking/milking-efficiently/milksmart-app 11



Milk Quality Improvement
nzfarmsource.co.nz/business/advice-support/mq-service/ 11

Animals



Heat Stress
www.dairynz.co.nz/animal/cow-health/heat-stress 12



Mastitis
www.dairynz.co.nz/animal/cow-health/mastitis/ 13



Lameness
www.dairynz.co.nz/animal/cow-health/lameness/ 13