

INSIDE DAIRY

Your levy in action



*My stock
are like my
children*

Labour of LOVE

Giving cows a great life

Tips from the calf pen **14**

A grazier's take on wintering **17**

What Kiwis think about dairying **19**



OVER THE FENCE...

People wellbeing and animal care go hand in hand.

Dairy farms rely on many variables, but our people and our animals sit central to it all, particularly as we head into a new season and calving.

Taking good care of our teams is always critical, but especially during the staff shortages we're currently facing.

Right now, we're building a long-term sector-wide plan for how dairy will attract and retain talent on our farms (page 16). A big part of our future workforce involves looking after the people we have now – retaining and growing today's farm staff.

Talent is a competitive space but there are new and different ways to attract and keep people. Some farmers are considering alternative rosters and hours, flexible milking, development opportunities, and a competitive salary package, for example.

When our people are in a good space, it benefits all areas of our farming businesses, including our cows. And that's the focal point of this *Inside Dairy*: animal care.

Being world-leading in animal care is a core part of our sector's Dairy Tomorrow strategy. To help achieve that goal, we ran a farmer-led workshop to explore what dairy farms designed well for cows would look like in 50 years. Part of that group were Central Plateau farmers Mark and Jamie Perrott (page 6) and Taupō's Annabel Donovan (page 13), whose passion for healthy, happy livestock leaps of the pages of this magazine.

Lastly, thank you to all farmers who attended the He Waka Eke Noa consultation, gave us your feedback over the phone, or provided input in some other way. We're currently announcing the outcome of our He Waka Eke Noa recommendation to the Government and we'll email you soon with a summary. We encourage you to review it and contact us if you have any questions.

As always, please reach out to me if you have any feedback – tim.mackle@dairyNZ.co.nz

Tim Mackle

Chief executive | DairyNZ

In this issue

- 2 Navigating climate change policy
- 12 Fonterra's take on animal wellbeing
- 16 It's time for a refocus
- 17 Wintering – a grazier's perspective

Regulars

- 4 Snapped on-farm
- 13 What's on my mind
- 18 What were we talking about?
- 20 Feed matters
- 21 Take 5
- 22 Just Quickly
- 23 Regional focus
- 24 Regional updates
- 25 DairyNZ contact list
- 26 Tech Series: Getting clear on animal care



On the cover:

South Waikato farmer Mark Perrott.



Prefer to read *Inside Dairy* online?

Go to dairyNZ.co.nz/insidedairy to opt out of the print version and sign up for an email notification when each issue goes live online.

ISSN 1179-4909

DNZ03-227

Inside Dairy is the official magazine of DairyNZ Ltd. It is circulated among all New Zealand dairy farmers, and sector organisations and professionals.

CONTENTS

Features



06

At the heart of it

A love for livestock attracted Mark Perrott to farming as a kid, and it remains at the core of his and wife Jamie's farming business years later.



14

Clued up on calf care

Tips for a smooth-running system from three calf rearers.



19

Measuring the mood

Are perceptions of dairying changing? The latest data is in.



We appreciate your feedback

Email insidedairy@dairynz.co.nz or call us on 0800 4 DairyNZ (0800 4 324 7969).



To find out how to recycle the plastic wrap used to protect this magazine during postage, visit dairynz.co.nz/insidedairy

Navigating climate change policy

It's a big year for climate change policy. To help you make sense of the noise, here's a rundown of what's coming in 2022 and what it means for you as farmers.

2030 TARGET

The 2030 methane target is legislated – but how we reach it isn't. Here are the steps that will determine how agriculture can reach this target in a way that's practical and scientifically credible, so farming businesses remain viable and our communities thrive as a result.

He Waka Eke Noa recommendation

The partnership delivers its final recommendation to the Government on an alternative ag emissions pricing framework to the ETS.

Emissions Reduction Plan

This is the Government's 15-year plan for how NZ will reduce emissions. It's the collection of policies and strategies across the entire economy.

New Zealand ag research and development plan release

Developed by a partnership between industry, Government, science and Maori, this plan aims to fast-track mitigation technology.

National Adaptation Plan

The Government's plan for how NZ will adapt to the physical impacts of climate change.

Climate Change Commission Advice

The Commission advise Government on He Waka Eke Noa and the readiness of our sector for agricultural emissions pricing.

2022



May



Jun

Government sets emissions budgets

New Zealand's emission milestones to track progress towards meeting Zero Carbon targets.

2050 TARGET

The 2050 methane target has been legislated between 24-47%, which DairyNZ believes is too high. We have an opportunity to advocate for farmers on this during the 2024 emissions target review. Our focus this year is to make sure the 2024 review is informed by the latest science, so targets are fair and achievable.

Government consultation on He Waka Eke Noa

Government will consult the public (including farmers) on their agricultural emissions pricing proposal. We will be watching closely on whether this differs from the He Waka Eke Noa recommendations, and will be making a submission.



Aug

Sept



Nov

Dec

2023

Legislating He Waka Eke Noa

Following public consultation, the Government will make its final decision on how agricultural emissions will be priced.

Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report (AR6)

This is a summary of the three technical reports delivered by the IPCC, to help governments work out what emission reductions are needed to reach the Paris Agreement warming target.

We want to see the Government acknowledge that long-lived gases (mostly CO₂) are the main driver of climate change, and to accept alternative science-based reporting metrics that can better measure the warming of short-lived greenhouse gases.

COP27

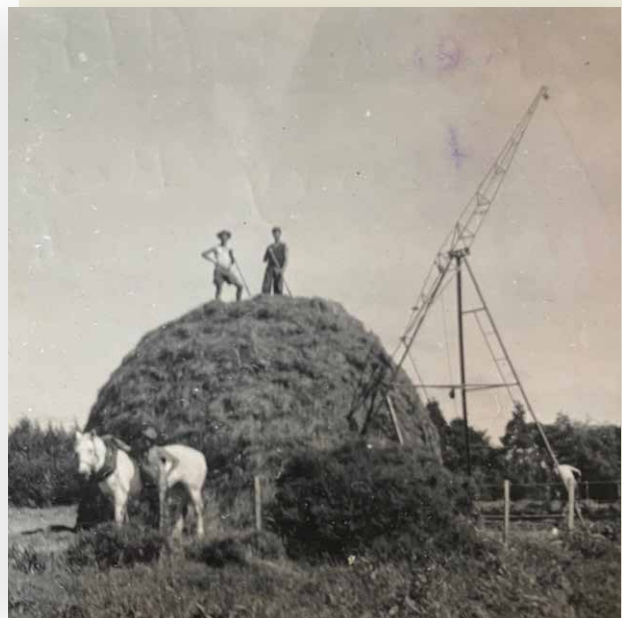
This is an international conference where policy-makers meet to discuss climate change and, potentially, re-pledge their country's emissions-reduction ambitions. We'll encourage the Government to take a science-based approach to any new emissions-reduction pledges they make that could influence the 2024 emissions target review.

DairyNZ will be working hard to ensure your voice is heard loud and clear by decision-makers, and that the science of farm systems and of greenhouse gas warming is brought into the discussion. That's vital to us having a robust and rational debate about what actions should be taken to adapt to climate change.



Snapped on-farm

Here's a handful of our favourite farming photos from social media recently. If you'd like your photo to feature, share your snaps by tagging us on social media or using the #dairynz hashtag.



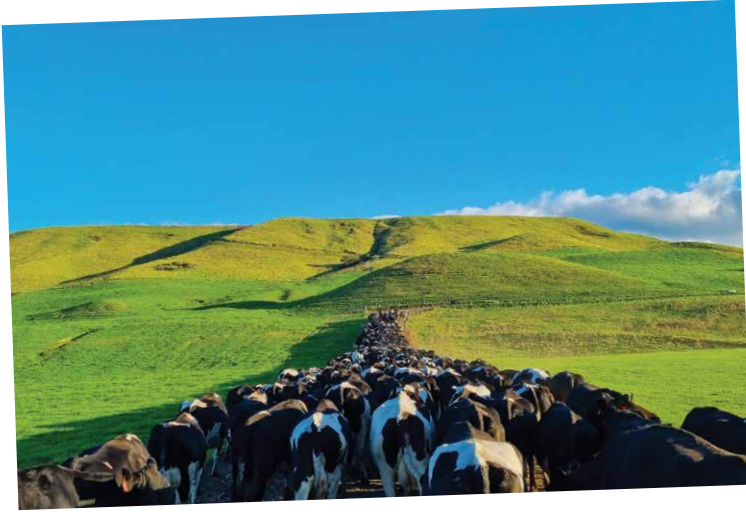
Posted by:

Jenny Buckley, 50/50 sharemilker in Tauwhare, Waikato.

"These are some old photos found in dad's cupboard. The quality isn't good because they weren't kept in albums. Hardly any of them have dates, but the dates that are there are from the 1920s to 1940s. Most of these photos are from the family farm in Matamata. Dad used to take the milk to the Waharoa factory every morning when he was younger."



lewisknauf



lewisknauf #dairynz

Photographer:

Lewis Knauf, farm manager, Hawke's Bay.

"Our last herd of 400 cows coming in for afternoon milking from the back of the family farm."



farm4lifequinn



farm4lifequinn #dairynz

Photographer:

Samantha and Quinn Morgan, farm managers in Galatea, Bay of Plenty.

"What it's all about. This is left to right: Peyton Morgan (5), Roman Morgan (3), Kiarah Rerekura (10) and Reign Morgan (4), with our dog Echo. The Morgan kids are ours, and Kiarah is my wife's little sister."

AT THE HEART OF IT

Ask South Waikato dairy farmer Mark Perrott what he loves most about his job and the answer is simple: his animals. Happy, thriving cows are the beating heart of the business, so Mark and wife Jamie make cow care a top priority, alongside the team's wellbeing.

"My stock are like my three children – all cared for and loved," says Mark, with eyes alight.

"Animals are not machines, so whether you have a small- or a large-scale farm, I think your goals should be the same: to treat every animal as if it's important. Otherwise, the pride and passion have gone. I know all my cows by their bums and udders."

“

I know all my cows by their bums and udders.

Mark and Jamie, sharemilkers and contract milkers in partnership with Trinity Lands, are continually looking for ways to give their cows and calves the best chance of being healthy and happy. And since a thriving cow produces higher-quality milk, this approach makes perfect sense, says Mark.

Mark's passion for livestock started early. At just seven, he was helping to cup cows on his parents' farm after school. He's never stopped loving it.

Jamie, also from a farming background, shares Mark's enthusiasm. The couple met at school and have been together since. Mark describes his wife as "wonder woman" for the amount she achieves. Jamie also runs a replacement farm nearby for Trinity Lands.





Mark (far right) and the team plan the next week's grazing.

All systems go

Having good systems in place across the board is key to good animal care, says Mark.

"We're constantly budgeting and planning. Whether it's feed, finances, or time off for staff, all these things contribute to having healthy, happy stock."

All stock are body condition scored quarterly to make sure they're in good nick. This is especially important coming up to mating. Mark says his goal is to get young stock up to speed quickly to get them in calf early.

"If they're not at target weight, they'll miss a cycle, and that's a missed opportunity."

The Perrotts rear 300 heifer replacements, and 30 Jersey bulls.

"For calves to become assets to the herd, we think it takes four things: good colostrum, warmth to grow, quality feed, and big pens with room to play. We don't like going to school without our friends, and I think animals need space to play together too," says Mark.

Farming on the Central Plateau can be challenging, especially during winter. Weather at calving time in July can be bitter, bringing -5°C temperatures, horizontal rain, and biting winds. During calving, with a hot water bottle under his jacket, Mark's out every two hours around the clock to pick up the newborns.

Because of the high altitude (550 metres above sea level), calves are inside for longer, have bigger sheds, and wear calf covers for transitioning to the outdoors. Jamie and farm assistant Piper Allen are full-time in the calf sheds.

“

We don't like going to school without our friends, and I think animals need space to play together too.



Rest and recreation

Mark says it's important to have a relaxed and rested team with energy to do their jobs well.

"It ensures the stock are also happy and the business runs smoothly. Our herd is quiet, calm and content, which is reflected in our results. This is a credit to our staff."

The Perrotts have a team of four: herd manager Gulzar Sangha, 2IC Johnathan McBride, and farm assistants Jack Perrott (Mark and Jamie's son) and Piper Allen. The staff choose their hours on an 11:3 roster and have every second weekend off, and the team gets together for social activities both on and off the farm.

Mark says he's fortunate to have plenty of staff, which allows for some job flexibility.

"Certain jobs need doing, but if they're done to a high standard and someone wants to have an easier day, that's fine by me. Having a good team behind me gives

me time to teach, focus on their needs and praise them for their efforts. We want the farm to be a happy place to live and work."

He doesn't employ on skillset but on attitude and team fit.

"We can teach the skills, but you either have a passion for livestock or you don't. I think I'm good at spotting strengths in people. If you have a weakness, by the time you leave here it's probably become a strength."



We can teach the skills, but you either have a passion for livestock or you don't.





Having a few laughs at work does wonders for team morale. Pictured left to right are Gulzar, Jono, Jack and Mark.

Keeping an eye out

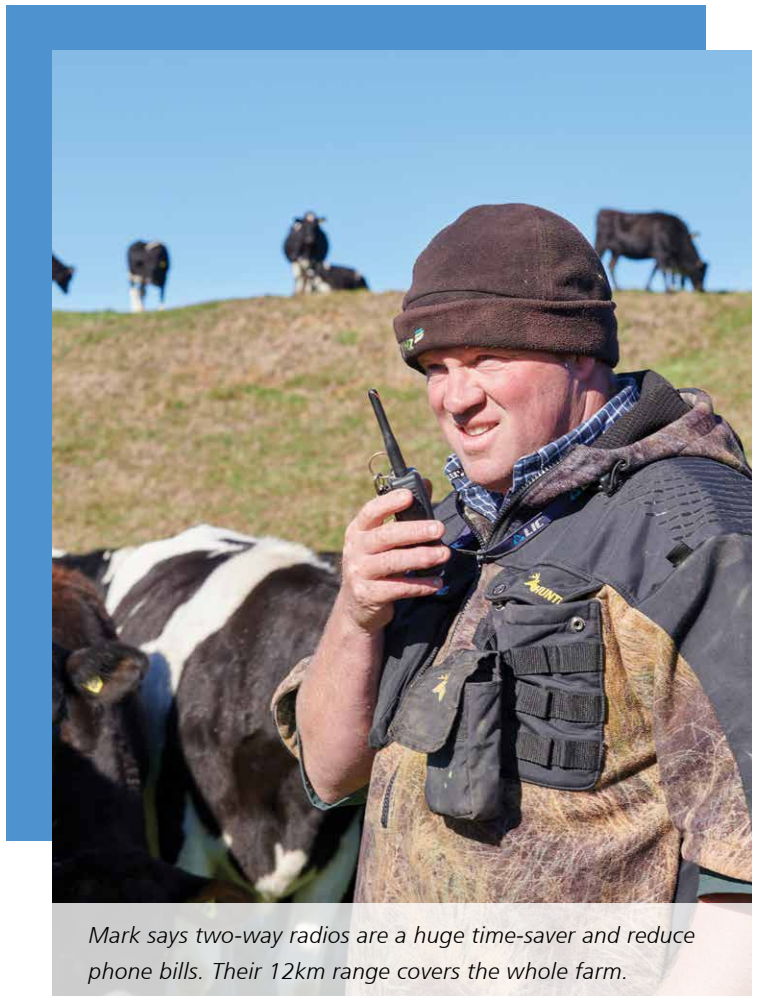
Mark and the team are keen observers of animal behaviour – ensuring the animals have sufficient feed, are playful and content.

“Their friends are important, so I’m of the opinion that the less drafting the better.”

The team monitors everything that can be measured, from grazing to mating.

“If there’s anything untoward, the information is shared either in verbal catch-ups or on the farm’s Messenger page,” says Mark.

Young staff are encouraged to talk to senior team members and to solve any problems themselves.



Mark says two-way radios are a huge time-saver and reduce phone bills. Their 12km range covers the whole farm.



Central Plateau has a winter climate much like parts of the South Island, with up to 80 frosts a year, but the fine days make up for it.

Room to grow

Given the farm was converted from a forestry block, it's ironic there are now very few trees on the land, says Mark. He and Jamie are keen to remedy this. They're considering what trees to plant, before preparing a budget proposal for Trinity Lands.

Summer temperatures can reach 25°C, so as well as planting trees for shade, Mark's keen to put a sprinkler system in the yard and a misting system in the shed to keep temperatures down and the flies at bay.

They're willing to pay for some improvements themselves, says Mark.

"They're our cows and we're in it for the passion, not necessarily the dollars. But don't get me wrong, it's possible to have both – we have a good lifestyle."



“

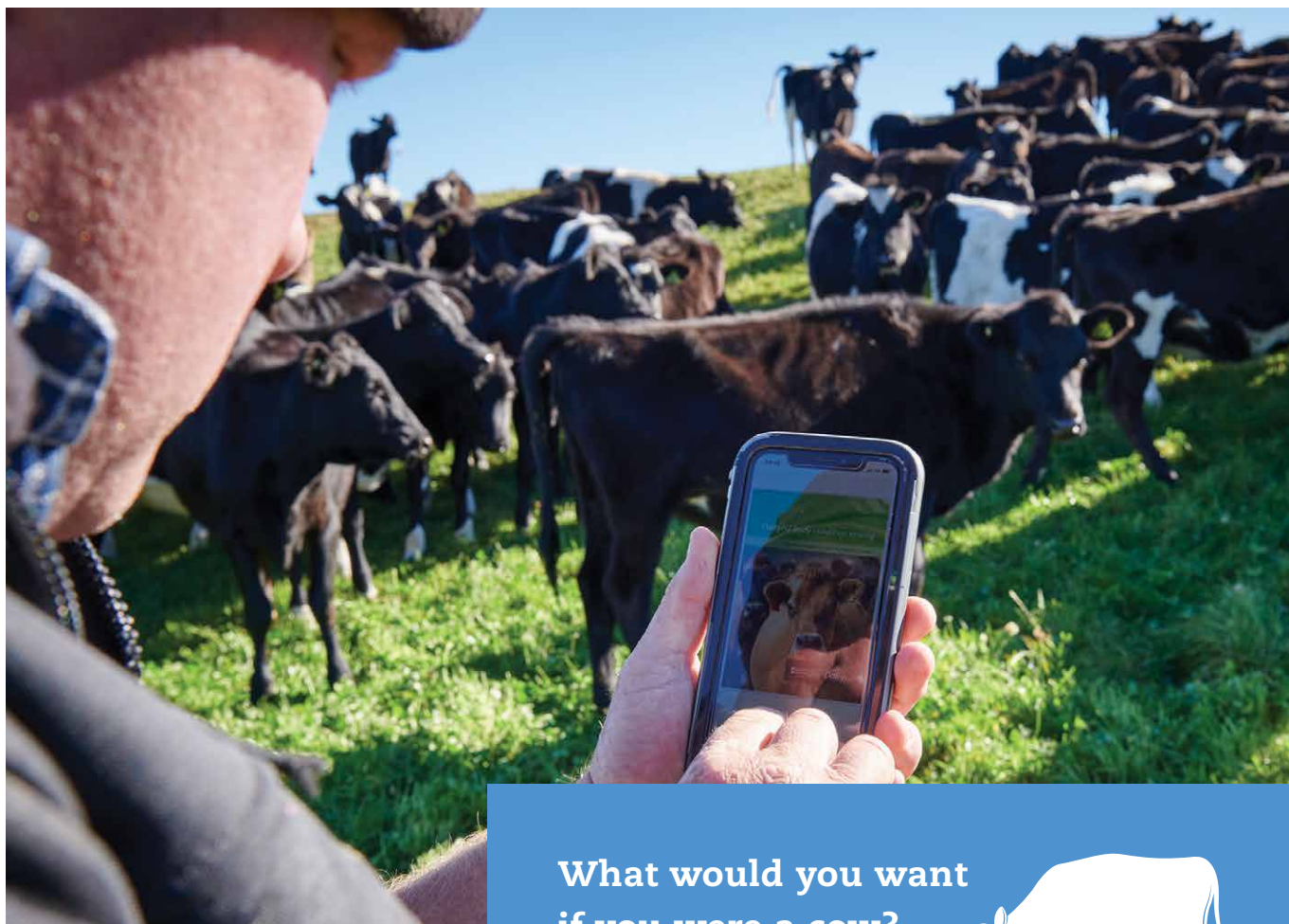
The best advice we've been given is to always be proud of the bottom 10% of your herd.

The bottom line

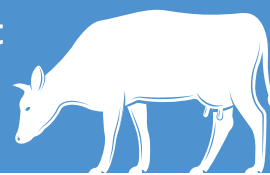
Mark says he and Jamie have worked for some really good people over the years, who've helped them get to where they are.

"The best advice we've been given is to always be proud of the bottom 10% of your herd. If they're doing well, you're on the right track.

"We want a system that gives cows and calves the best chance of being healthy and happy. Without them, there's no income for any of us."



What would you want if you were a cow?



Cows are arguably the most important stakeholder in a dairy system. So, what do we need to change in our farm systems to better meet their needs?

That question was put to a group of farmers, including Mark and Jamie Perrott, as part of a New Zealand Bioeconomy in the Digital Age (NZBIDA) programme. The farmer workshop aimed to understand what a cow-centric dairy farm system would look like in NZ and how it could be achieved in the next 50 years.

The farmers identified some key areas:

- better access to shade, and shelter from extreme weather
- a more comfortable environment, in particular lying surfaces
- more choice and control for cows in daily activities, including having enough time to eat, rest and socialise
- focus on the care provided by humans
- individual management of cows.

Farmers acknowledged that some of these changes would be easy to implement, while others would require more input, technology and time. The findings from this workshop will be incorporated into planning for future NZBIDA work.

FARM FACTS

Mark & Jamie Perrott

LOCATION:

Kinleith, 15km southeast of Tokoroa

FARM SIZE:

507ha (effective, including runoff)

HERD:

1020 KiwiCross

MILKING ROUTINE:

TAD

PRODUCTION:

502,000kg MS

Fonterra's take on animal wellbeing



Caroline Murray, Fonterra's General Manager of On-Farm Excellence – Animals, offers a processor's perspective.

Caroline, what are your consumers asking for when it comes to animal wellbeing?

"Care for animals is a significant factor for consumers all over the world. In some countries that's because people have an ethical expectation that animals should be treated well, while in others it's driven by a perception that healthy animals make healthier milk. Our New Zealand pasture-based way of farming is highly regarded and a major point of difference. Consumers like that our cows are outside on pasture."

Are there any differences in what local and international consumers expect?

"It's fascinating how expectations differ; an issue that's important in one market can be ignored in another. Because our animals are outside, our farms are a lot more visible, whereas overseas, fully housed dairy farming is common. New Zealand's public seems to generally understand that our farm animals are well cared for. Cows outside eating grass and interacting with each other is normal, while this may be completely foreign in other geographies. International consumers have varying interactions with farms and, therefore, their expectations are more diverse. One consistency across the board is that we're being asked more and more to prove how well our animals are treated."

What's something new you're doing to improve animal wellbeing?

"This season we've added a financial incentive for farmers to adopt specific good-farming practices through The Co-operative Difference framework. From an animal care perspective, farmers are being encouraged to develop an Animal Wellbeing Plan with their vet, which builds on the health plans many farmers will already be making."

How do you balance meeting everyone's needs?

"This can be tricky, particularly when speaking to people overseas who don't understand our farming practices. Even fundamental things, like the seasonality of farming in this

country, don't make sense to them when their animals spend their lives indoors. A customer might ask if we have enough cubicles for all our cows, and we have to explain why that's not relevant. They might still want us to provide evidence, but at what cost? Our farmers wouldn't appreciate us going onto their farms looking for cubicles we know don't exist!"

Are you only doing this because it's what consumers want?

"We're always striving to improve on-farm outcomes, but that's because it's an intrinsic good. There's an extra benefit if better animal wellbeing can support consumer expectations, but as discussed above, if some of those benefits get lost in translation, that doesn't mean they aren't worthwhile."



Roughly 75% of Fonterra's farmers planned to have made an Animal Wellbeing Plan by the end of the 2021/22 season.

WHAT'S ON MY MIND

We're kicking off a new regular page in *Inside Dairy* where we ask one farmer to tell us what's on their mind. First up is Taupō farm owner and once-a-day advocate Annabel Donovan, who's been pondering the link between cow care and people wellbeing.

As dairy farmers, our day's work revolves around the cows and their needs. We work as much for them as they do for us, and our routines have to work well for cows and humans. We are two families caring for 550 Jersey cows and 250ha of land – just small cogs that help fuel the economy of Aotearoa NZ.

When you have animals, their needs come first. But to meet their needs, we need to look after ourselves. We need to keep the flame of passion alive for the work we do. Ourselves and staff need to be fed, watered, rested, appreciated and, at times, inspired by new ideas so we are physically and mentally able to give world-class care to our animals.



Annabel, seen here with one of her star performers, 202, and her chief rabbit hunter Pip, was part of DairyNZ's world-leading animal care group.



We need to keep the flame of passion alive for the work we do.

Farming is a holistic lifestyle, and as lifestyle expectations change, farming needs to change too. For the past 10 years we have milked our herd once a day (OAD) and we believe this better meets the needs of our people and animals.

What's good for us is also good for the cows. They enjoy many health and lifestyle benefits from the OAD regime, simply because they have more time to socialise, graze, sleep and ruminate. Our cows are calm and happy.

The breeding options for the cow suited to a OAD system are here now. Over the past 10 years, we've bred cows better

suited to OAD milking, resulting in cows with better udders and capable of producing their own bodyweight in MS on grass.

Our staff have also adapted well to OAD. No one misses afternoon milking and, in the wee hours of the morning, we like to be asleep.

Of course, OAD is not for everyone, or every cow, and other alternatives to optimising human and animal wellbeing are out there. But for us, OAD ticks so many boxes related to human and animal wellbeing (and profitability too).

Clued up on calf care

A quick look at how three calf rearers make calving season run as smoothly as possible.



Anna Ashmore

Contract milker | Heddon Bush, Southland
| Spring calving | Rearing about 250
replacements

What have you tried that's made calf rearing easier?

Being organised and having good procedures in place, so everyone is on the same page. For example, making sure all team members know what pens to drop calves off to, or if they tube-feed a calf, that the calves are marked appropriately so the calf rearer knows they've had a feed.

Also, having a nanny for the children when they were younger! It meant I wasn't in a rush and could take the time to enjoy the job, knowing the kids were nice and warm and well looked after at home. A bonus was that, often, dinner was cooking by the time we got inside.

Favourite thing about calving season?

The calves! I definitely get favourites. I also enjoy the busyness and mayhem of calving time. I find I'm way more productive and organised when I'm busy.

Top tips for calf rearing?

I leave a bucket of gold colostrum in a hot water bath, so if any of our team brings calves in when I'm not there, they know to tube-feed each calf 2L of warm gold and mark the calf to indicate it's had a feed.

If I have any calves not looking as chirpy, I'll leave a 20L bucket of electrolytes inside a tyre in their pen. Most of the time it's gone by the next feed and calves have bounced back.



Wendy Main

Owner | Oxford, Canterbury | Spring
calving | Rearing 150 heifer replacements
+ has a contract for four-day-old Friesian
bulls

How do you ensure a smooth calving season?

We have whiteboards in all the pens, including bobby calf pens, so any issues with the calves in that pen are clearly written up – good and bad. The whiteboards also include the number of calves in each pen, how much they get fed, and whether they're feeding once or twice a day or transitioning from twice to once.

Favourite thing about calving season?

Getting to the shed in the afternoon to see what calves have come in, especially Ayrshires, which we have as a side hobby.

Something you've learned that's made calf rearing more efficient?

KISS (keep it simple stupid). I feed calves during milking times so if there are any issues, staff can be found easily, rather than looking all over the farm for answers.



It also means I can ensure we collect the correct milk and enough gold colostrum, and that it's still warm.

Top tips for calf rearing?

Firstly, ensure everything is ready well before the first calf is born.

Secondly, ensure you and the team get enough rest, which means having regular days off. These days may change, e.g., we normally have two staff off at weekends, but during calving this may change to one off on Friday and Saturday and the other off on Sunday and Monday. It pays to be fit and well rested before calving starts. If anyone's showing fatigue or lets us know they're tired, we give them either a sleep-in or time off.



Penny Brown

Owner | Pirongia, Waikato | Autumn calving | Rearing about 200 calves (this year, predominantly dairy heifer replacements, but often rear beef calves to weaning)

How do you ensure a smooth calving season?

We have a comprehensive Standard Operating Procedure (SOP), which starts from three weeks prior to birth for the cow's transition period and goes right through to the calves heading off-farm to grazing.

The SOP is a working document that outlines exactly how we do things and it can be updated as needed. It's a great resource to have on hand so our staff are on the same page and understand our system.

Favourite thing about calving season?

Getting the calves out in the paddock and feeding them on the calfeteria. Autumn calving is perfect with the weather so good. I also enjoy weigh days and sorting the mobs accordingly.

Something you've learned that's made calf rearing more efficient?

Getting set up with a pump and nozzle that accurately measures the milk going into each feeder. It's a huge relief not having to lift buckets of milk each day. Having a 5t silo with a side auger for calf meal is also a bonus, as I can tow the meal trailers under it to get filled and then taken to the calf paddocks. Again, it means less lifting!

Top tips for calf rearing?

Ensure each newborn calf gets gold colostrum as soon as possible after birth. We use colostrum powder for heifer replacements, and tube-feed it to ensure they're getting the best start.



IT'S TIME FOR A REFOCUS

Solving our ongoing labour shortages requires transformation to core parts of our sector, writes DairyNZ Strategy & Investment Leader Nick Robinson.

People are critical to a thriving dairy sector, but we're currently short of around 4000 on-farm staff nationwide. As you well know, for those impacted, it takes a huge toll on job satisfaction, wellbeing, and overall business performance.

Three key problems underpin our sector's workforce shortage:

1. We're heavily reliant on people to operate.
2. We're not attracting enough people (or the right people) to on-farm roles to ensure safe and effective operations.
3. We're not keeping enough of the right people with the right skills.

Other challenges facing dairy include a slow-down of New Zealand's overall population growth, an ageing workforce, fewer workers between 20-30 years old, more rural workers being absorbed in urban centres, and career-seekers having more opportunities to choose from.

The pandemic brought to light our sector's struggle to attract and retain Kiwis to dairy farming and has shown how much we rely on migrant workers to fill vacant roles. This is not sustainable.

We're tackling these challenges through *Great futures in dairying*, our sector plan for a resilient dairy workforce. The plan calls for a sector re-focus to ensure we're all doing the right things over the next 10 years to improve the supply and retention of capable, skilled people on our dairy farms.

The plan has three focus areas, each with a set of actions and priorities:

① Shape up

so we are competitive and grow and retain our people

② Change the job

to provide modern, productive and safe workplaces

③ Look in new places

to attract a larger and more diverse talent pool

I'm incredibly excited about the roll-out of this crucial programme of work. It's a transformational plan, and it requires us all to be creative, bold and committed to solve our workforce issues. It won't be easy, but the cost and toll on you, farmers, would be far greater if we do nothing.

You'll be hearing more about the *Great futures in dairying* plan in coming weeks. Until then, download a copy at dairynz.co.nz/great-futures

WINTERING

– a grazier's perspective

Dairy farmer turned grazier Bart Gysbertsen provides an insight into running a large winter grazing operation in Wairarapa.

After dairy farming for 23 years, Bart and his wife Tineke got involved in converting a 400ha sheep and beef block into a dairy farm.

Bart soon suggested the farm owner might want to take on dairy graziers.

“That’s how the heifer grazing started. It never turned into a dairy farm, as the owners sold the land to Bryan (Tucker), who was happy to keep it a grazing block because demand for quality grazing is high.”

Bart and Tineke have been managing the grazing operation for Bryan ever since.



It's always satisfying to see well-grown heifers going home.

“We’ve done this for eight years now and are loving it. It’s always satisfying to see well-grown heifers going home,” says Bart.

This winter, they’re caring for 3000 animals on the now-440ha farm near Greytown, which Bart says is ideal for the purpose.

“The country is flat, with free-draining stony-silt-loam soils that are perfect for winter grazing. We’re not near any waterways, and when the weather’s wet we have very little mud – 100mm would be the worst it gets.”

As well as wintering about 1600 cows for eight to 10 weeks, the Gysbertsens graze 700 R1s and 750 R2s. Calves arrive as 100kg weaners in November and stay for about 18 months, leaving before they calve. Young animals are body condition scored and weighed regularly with data uploaded to LIC’s MINDA.

From May 2022 to April 2023, up to nine-month-old weaners cost \$9/week, and from nine-months-old to 21-months-old cost \$12 a week. Winter grazing rates for cows are calculated on a per kg DM basis: the current rate is 36c/kg DM. Cows are fed 14kg DM a day, which works out at \$35.28/cow/week.



Tineke and Bart are growing 80ha kale this winter, and they allow a 10% buffer of unallocated feed in case of bad weather.

Stock graze on kale and are also fed grass silage and hay. Bart says animals don’t need much transitioning onto kale.

“They get more silage the first week and less kale but, by week two, they’re on 10kg kale, 2kg silage and 2kg hay – and loving it.”

Each paddock has two water troughs, one a quarter into the paddock and the other three-quarters in, making it easy to back-fence so stock have easy access to water.

After a barley catch crop’s harvested in January, the paddocks are re-grassed in March/April with permanent ryegrass and clover on a four-year rotation. Once the R2s have gone in July, Bart grows a huge surplus of grass in September and October.

“We’re able to make 500t DM silage and 800 big bales of hay.”

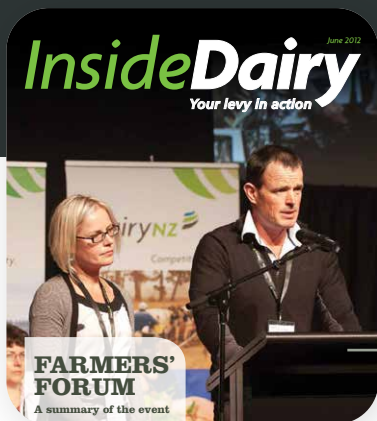
Bart enjoys his relationship with the cattle and the land.

“There’s nothing more pleasing than seeing stock content at the end of every day, so I can sleep well at night.”

Check out dairynz.co.nz/wintering for more information.

What were we talking about?

Growing demand from China, falling milk prices, a new thing called NAIT, and London Olympics 2012 were some of the hot topics in our June 2012 issue of *Inside Dairy*.



On our cover are Paeroa 50:50 sharemilkers Scott and Alicia Paterson, who were on the farmer panel at Farmers' Forum 2012 speaking about how they build a motivated farm team.



Most of this *Inside Dairy* is dedicated to a review of the recently held Farmers' Forum. The late John Luxton, DairyNZ chairman of the time, writes on page six that his take-home messages from the Forum were:

- the growing importance of China to our dairy industry (a message reinforced by speakers such as then-ANZ chief economist Cameron Bagrie and then-Fonterra CEO Theo Spierings)
- despite a recent fall in international dairy prices and the milk price, the medium- to long-term future looks bright
- our natural resources, particularly water, offer us great opportunity for economic prosperity
- the management of our farm environmental footprint is crucial.

We meet the winners of DairyNZ's Prize Pond competition: Canterbury farm owners Murray and Shirley Thomas, and sharemilkers Dave and Pip Howard; and Taranaki farm owner Ken Sole and sharemilker Dan Merritt. The winning prize? A BBQ with the one and only Richard Loe, former All Black, farmer, and radio host.



Also in this issue:

- We announce the launch of a new independent, regional-specific evaluation system for perennial ryegrass cultivars: the Forage Value Index (FVI).
- Also new is the National Animal Identification and Tracing (NAIT) scheme, and we remind all dairy farmers to register their cows by July 1, 2012.
- Can cows gain condition in the last month before calving? Not so, writes Dr John Roche in this month's mythbuster.
- In our 'What's hot, what's not' section, we reckon the build-up to Olympics 2012 is pretty hot, while losing your car at Mystery Creek is definitely not.

Check out the full magazine at dairynz.co.nz/ID-June-2012

MEASURING THE MOOD

Take a glance at what the latest survey results tell us about public perceptions of dairying, and what's helping drive the uptick.

NZ public impressions of the NZ dairy sector are improving



59%

feel *somewhat or very positive* towards the dairy sector (up from 53% in Q1 2020 and 57% in Q1 2021)



6 in 10

trust *dairy farmers are doing the right thing* when it comes to their responsibility towards the environment



88%

agree that *dairy is a major contributor* to a strong NZ economy



51%

agree that *dairy farming is an attractive career option* for young Kiwis (up from 38% in Feb 2019 and 45% in Oct 2020)

Source: DairyNZ Quarterly Public Survey

What's helping shift the needle?



Levy-funded ad campaigns

DairyNZ's Vision is Clear
(Nov 2018 - Sept 2021)

1.7 million

Kiwis saw/heard the campaign via NZ Herald online, newspapers, radio and social media

DairyNZ's Join Us
(Jan - April 2022)

An estimated **3.1 million** people saw the campaign in just three months



Our work with the media

DairyNZ's media team helps tell our sector's story and deliver more balanced media coverage.

The team's involved in news stories that have, on average, around

9 million

unique page views each month

On average, DairyNZ is connected to **200 stories**

a month, helping deliver 90% favourable-neutral media coverage



Our work with school students

Rosie's World website

20-25k

visitors a month

Rosie's World Facebook page

15.6k

total page likes
(up from 13.2k a year ago)

'Moo to You' kits

3400

students (in 530 schools) have used them in the first two terms of 2022



More milk but what about profit?

High milk prices will have some farmers driving for more production, but beware the hidden costs, writes DairyNZ's Chris Glassey.

In a time of rising input costs and severe staff shortages, there's a risk that importing more feed to produce more milk can lead to more work and not necessarily more profit. This was clearly shown by six years of supplement trials recently completed at the Northland Agricultural Research Farm near Dargaville.

"Importing more feed came with hidden costs," says Kim Robinson, (AgFirst) coordinator for the Northland Dairy Development Trust (NDDT), which ran the trials.

Kim recently summarised these trials in an excellent article in *The Journal*, NZIPIM's publication for rural professionals. (Read Kim's article at bit.ly/3KCHadq).

NDDT's analysis showed that, for each dollar spent on purchasing supplement, 66-86 cents was added to other farm expenses. These extra costs relate mainly to labour and machinery costs associated with feeding out, which effectively increased the cost of PKE from 33 to 60 cents/kg DM. PKE prices have now risen towards 50c/kg DM but there's also been significant inflation in the associated costs. So, the increase of 66-86c per \$1 spent on PKE likely still applies, and feeding PKE could now cost closer to 85c/kg DM.

Consultants don't always take account of these hidden costs when evaluating feed inputs, Kim comments in her article.

"Farmers instinctively know these costs are occurring and make comments such as: 'My milk production has gone up and I am working harder, but I don't seem to be making more money'," says Kim.



Farmers must ask if recent cost increases are threatening profitability, even at current high milk prices.

The best time to review costs is when you don't have to. It's much less stressful to analyse your costs now than if/when we have a milk price drop and you're cutting costs to break even. Farmers must ask if recent cost increases are threatening profitability, even at current high milk prices.

At DairyNZ, we know of farmers who've recognised the cost of producing more milk has exceeded the extra revenue. Those farmers have reduced costs by withdrawing feed and cows, and sometimes also reducing their milking frequency (with positive effects on both profit and workload).

Lastly, as Kim mentions in her article, changing environmental regulations are also putting the spotlight on high-input systems and leading farmers to question whether their systems are sustainable for people and the environment. Therefore, it's important to look at all aspects of the farm system when assessing change.

Funders for this trial were DairyNZ, Ministry for Primary Industries (through Sustainable Food and Fibre Futures), and Hine Rangī Trust.

\$1
spent on supplement

adds

66-86 cents
to farm expenses



TAKE 5

Tips for farmers

1.



Test for the best

You can test to see if your calves are receiving enough antibodies from colostrum by getting your vet out to blood test 12 healthy calves. Doing this at the start and peak of calving will give you the best insight – dairynz.co.nz/colostrum



3.

Is your business robust?

Check by completing two budgets for the 2022/23 season: one with the latest milk price forecast and current bank interest rates; the other with a pessimistic milk price and higher interest rate. This will prepare you for both scenarios or somewhere in between.

Budgeting tools available at dairynz.co.nz/budgeting-tools

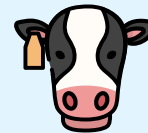
2.



Warm welcome

By mapping out a top-notch farm orientation and support plan for your new staff, you'll increase the likelihood of them staying with you. Just 54% of new staff who experience a poor orientation stay for the first year, but you can make this 75% with a great orientation and ongoing support. Go to dairynz.co.nz/orientation

4.



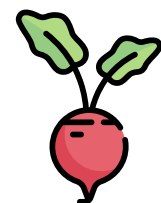
Update NAIT

Moved stock recently? Don't forget to update your NAIT records. Also make sure your grazer is keeping their NAIT account up to date too. Find out more at dairynz.co.nz/NAIT

5.

Feeding fodder beet this season?

When yielding, make sure you yield the leaf and bulb separately so you can work out the proportion of each. Feed-test them separately so you know what you're feeding. Hear more about fodder beet in our recent *Talking Dairy* podcast (episode 25 at dairynz.co.nz/podcast).





NZDIA national winners

A big congratulations to all entrants, finalists and winners of the New Zealand Dairy Industry Awards (NZDIA) 2022.

This year's awards were a true demonstration of talent, hard work, and commitment to the sector. It was a clean sweep for the Canterbury and North Otago regions, with Peter O'Connor (Dairy Trainee of the Year), Will Green (Share Farmer of the Year) and Jaspal Singh (Dairy Manager of the Year) taking out the national titles.

Full results at dairyindustryawards.co.nz

FREE TRAINING IN ANIMAL WELLBEING

Interested in learning some new skills to give your herd the best life possible?

Believed to be a world first, a new fully funded training programme focusing on the benefits of animal wellbeing has been developed by QCONZ in collaboration with UCOL, Fonterra and DairyNZ.

Designed for owners, managers and 2ICs, the free course focuses on the benefits of affordable, practical, good-animal-care practices. You'll learn about body condition scoring, early identification of lameness, heat stress management, time budgeting, and animal wellbeing planning.

The course involves some online learning and a one-day workshop, followed by skills practice and an on-farm assessment. You'll come away with a Level 4 Certificate in Animal Wellbeing (Dairy)

Enrol at awb.qconz.co.nz



Keep a spring in your step

Sprain and strain injuries are common in dairy workplaces – especially in spring. Data recently collected by DairyNZ shows:



1 in 5 of those injured requires more than one week off work



So, take care this spring by examining the risk areas of your farm, like calf pickup, milking techniques and posture, calf rearing, and selecting the right footwear for the job.

At DairyNZ, we've partnered with ACC on a three-year project aimed at designing solutions to reduce sprain and strain injuries that are cost-effective, while also making work easier.

DairyNZ associate director sought

Dairy farmers with a focus on progressing their governance career and contribution to the dairy sector are encouraged to apply for an associate director role with DairyNZ.

This is a unique opportunity for farmers to play a part in their industry-good body and participate in discussion and debate. The position is open to current levy-paying farmers who are demonstrating leadership within their community and/or dairy sector.

Associate directors are non-voting roles and appointed for a one-year timeframe (October to October), comprising seven board meetings.

Email sheree.kara@dairynz.co.nz to apply before June 27, 2022.

PEER-TO-PEER PAYS OFF

A farmer-led project in Northland has been instrumental in lifting farm performance in the region.



Waipu dairy farmer Lachie McLean had some reservations about joining the Extension 350 (E350) programme – but those are long gone.

After working on the family farm for 45 years, Lachie, in his mid-60s, was looking to take a step back but didn't want to let his team down. The workload of running the farm and developing infrastructure was demanding. He thought E350 might give him some pointers.

“There were times when I wondered if I'd done the right thing by joining E350 because the fortnightly reporting was a bit of a challenge. But three years later, I'm very grateful to have had the opportunity to take part,” he says.

“The key thing was having many minds working on our operation, which made me look at our business with fresh eyes. We've developed new infrastructure and employed a 50:50 sharemilker. I've learned new skills in managing staff, animals and pasture, and I have a new, more disciplined approach to the business.

“My mentor Dave Robinson and the other advisors have had a huge impact and I can't thank them enough.”



The key thing was having many minds working on our operation ...



Lachie McLean, left, with mentor Dave Robinson.

Lachie says production has improved by 9%, pasture eaten has gone from 8.1kg DM/ha to 9.3kg DM/ha, six-week in-calf rate from 71% to 79%, and the not-in-calf rate has dropped from 8% to 4%.

The five-year E350 programme aimed to attract 350 farmers, but this target was surpassed, with 379 beef and dairy farmers taking up the challenge to help achieve better economic prosperity, environmental sustainability and wellbeing for themselves and the region.

Experienced farmer mentors and specialist advisors helped farmers to develop their own vision and strategies.

Project lead, Northland Inc's Luke Beehre, says while the project hasn't been without its challenges due to Covid-19 alert level changes and various weather-related events, E350 has proved its value.

“The programme's triple-bottom-line lens of improved profitability, environmental sustainability and farmer wellbeing means farmers come out having progressed towards their goals and with the skills and network of support to help them continue to adapt to the changing farming landscape.”

At the next E350 field day in Okaihau on June 8, learn about the great wins farmers have had in terms of profit, people and planet. Details at dairynz.co.nz/events

Extension 350 is supported by the Ministry for Primary Industries, Northland Regional Council, DairyNZ, Beef + Lamb NZ and Northland Inc (Northland's regional economic development agency).



Feature update

Bay of Plenty

Want to work out the best milking interval for you, your staff and your cows? Would a 3-in-2 or 10-in-7 regime help you achieve your business targets?

Come along to the Focus on Dairying Field Day in Onepu on June 16, where you'll hear from a panel of Bay of Plenty farmers – Bridie Virbickas, Colin Wilson and Ricky Phillips (manager for Nick Dowson) – who've adopted a flexible milking regime. Learn about their reasons for making the change, the benefits, and any issues they've experienced.

Renowned flexible milking researcher, DairyNZ's Dr Paul Edwards, will provide valuable insights on its implementation and effects, how it's being managed in commercial herds, and how to best introduce it into your business.

Details at dairynz.co.nz/events

Bay of Plenty farmer Bridie Virbickas will be speaking about flexible milking at the Focus on Dairying Field Day.



Waikato

Get a head start on spring by refreshing your Spring Rotation Plan at one of our Waikato workshops. Grazing management in the first two months after calving plays an important role in determining milk production before Christmas and how well-fed cows are at mating. Spring rotation planning helps you take the guesswork out of grazing management, allocating pasture to cope with the milking herd increasing and the dry herd shrinking over that critical period.

Visit dairynz.co.nz/events for details of a workshop near you.

Taranaki

DairyNZ is excited to be working alongside Dairy Trust Taranaki on a seven-year project looking at the pros and cons of regenerative farming in Taranaki.

The project has kicked off with a trial comparing the difference between regenerative agriculture and conventional agriculture when it comes to production, profitability, environmental effects, and consumer perception.

This work is happening at Waimate West Demonstration Farm, which will run as two farmlets of 17.2ha, each with 60 Crossbred cows. One farmlet will be sown in diverse pastures, and the other in conventional ryegrass and white clover pastures. Cows have a SmaXtec bolus, which will monitor their animal behaviour throughout the trial.

We look forward to seeing the results and sharing them with you.

Lower North Island

With Covid-19 restrictions starting to lift, our Lower North Island team are looking forward to getting out and about to connect with local farmers over the next couple of months. If you're a new farmer to the region and would like to know more about events near you, who to contact, and support available, visit dairynz.co.nz/teams

Top of South Island / West Coast / Canterbury / North Otago

South Island Dairy Event (SIDE) 2022 is coming to Oamaru this year, running on June 8 and 9 at the Oamaru Opera House. Come along to hear from a range of dynamic keynote speakers, including Justine and Geoff Ross, Craig Piggott and Dr Tom Mulholland. There'll

be two offsite trips, plus two days of dairy-focused workshops, such as 'The pros and cons of cow collars and tags' and 'Farmers are landlords too – managing on-farm housing'.

For sponsorship enquiries and the event programme, visit side.org.nz



Craig Piggott, founder and CEO of Halter.

Southland / South Otago

Does fodder beet have a positive future as a feed for cows in New Zealand? And how do you put systems in place to maximise cow performance and animal health, while also minimising fodder beet's risks? We put those questions, and more, to DairyNZ scientist Dr Roshean Woods and veterinarian Dr Charlotte Westwood in episode 25 of the *Talking Dairy* podcast. Roshean and Charlotte have been involved in a three-year research project on fodder beet and they shared the results with us.

Check it out at dairynz.co.nz/podcast

DairyNZ contacts

Simon Sankey	Key Relationship Partner	021 228 3446
Clinton Hemana	Kaiārahi Ahuwhenua	027 1800 4505
Cheyenne Wilson	Māori Relationship Partner	027 1800 3793

Northland

Regional Leader	Alison Whiteford	027 499 9021
Extension Partner	Hamish Matthews	021 242 5719
Extension Partner	Stephen Ball	027 807 9686
Extension Partner	Mike Bramley	027 486 4344
Regional Partner	Kathryne Easton	027 1800 3882

Waikato North

Regional Leader	Wilma Foster	021 246 2147
Regional Partner	Kylie Brewer	027 1800 3156
Regional Partner	Andrew Allen	027 1800 3025
Extension Partner	Jaimee Morgan	021 245 8055
Extension Partner	Chris de Wet	027 1800 4410
Extension Partner	Kent Weston-Arnold	027 288 1244

Waikato South

Regional Leader	Brigitte Meier	027 448 3050
Regional Partner	Steve Canton	027 475 0918
Regional Partner	Debbie Young	027 1800 3786
Senior Extension Partner	Phil Irvine	027 483 9820
Senior Extension Partner	Frank Portegys	027 807 9685
Extension Partner	Denise Knop	027 513 7201

Bay of Plenty

Regional Leader	Sarah Speight	027 1800 4222
Regional Partner	Kevin McKinley	027 288 8238
Senior Extension Partner	Ross Bishop	027 563 1785
Extension Partner	Ian Burmeister	027 593 4122
Extension Partner	Chris Hurlston	021 225 8345

Taranaki

Regional Leader	Charlie McCaig	027 244 7915
Regional Partner	Gill Haenga	027 1800 3605
Regional Partner	John Baylis	027 210 2137
Extension Partner	Ashley Primrose	021 246 5663
Extension Partner	Talissa Squire	027 1800 3499
Extension Partner	Katie Starsmore	027 1800 3707

Lower North Island

Regional Leader	Mark Laurence	027 704 5562
Regional Partner	Michelle Greaves	021 280 8405
Senior Extension Partner	Gray Beagley	021 286 4346
Senior Extension Partner	Abby Scott	021 244 3428
Extension Partner	Janine Swansson	027 381 2025
Extension Partner	Francesca Bennett	027 702 3760

Upper South Island

Regional Leader	Tony Finch	027 706 6183
Regional Partner	Antoinette Archer	027 1800 3122
Regional Partner	Anna Hall	027 411 5663
Senior Extension Partner	Mark Shadwick	021 287 7057
Extension Partner	Heather Donaldson	027 593 4124
Extension Partner	Amy Chamberlain	027 243 0943
Extension Partner	Hamish Lambeth	027 290 5988

Southland/South Otago

Regional Leader	Guy Michaels	021 302 034
Regional Partner	Stuart Evans	027 393 0114
Senior Extension Partner	Nathan Nelson	021 225 6931
Extension Partner	Karen Duthie	027 358 7579
Still recruiting		

DairyNZ directors

Jim van der Poel	021 848 484
Elaine Cook	027 223 2049
Colin Glass	027 486 4064
Jacqueline Rowarth	027 694 4334
Peter Schuyt	027 557 4242
Tracy Brown	027 291 1716
Mary-Anne Macleod	021 923 332
Margaret Devlin	021 328 200



Getting clear on animal care

We know animal welfare is important, but what exactly does it look like to give cows a good quality of life, and what do consumers and the public expect from us? In our latest *Tech Series* article, we seek answers from a growing body of research, while also looking at what farmers think and what scientists are learning about the complex physical and psychological needs of cows.



Dr Jenny Jago
Principal scientist,
DairyNZ



Katie Saunders
Lead Advisor Animal Care,
DairyNZ



Helen Thoday
(Former) Senior Manager,
Solutions & Development,
DairyNZ

Key points

- For an animal to have good welfare, its nutritional, environmental, health and behavioural needs must be met.
- There is general agreement between what consumers, public and farmers believe is good for dairy cows.
- There is a well-established understanding of what's required to protect animals from negative experiences.
- We also need to develop practical ways to include positive experiences for animals.
- New Zealand dairy farming is well positioned to meet the animal welfare expectations of consumers and the public.

Animal welfare has always been important for farmers due to its links to farm performance and their connection with the stock they care for. In recent years, animal welfare has become more important to customers as they place greater value on the welfare of the animals providing product for consumption^{1,2}. This is especially true for markets in developed countries. Because New Zealand dairy products are traded globally, international trends in public and consumer attitudes also apply to farming practices here.

What do customers and consumers want?

Customers and consumers are concerned about animal welfare and ethical farming practices, and many want proof that their expectations of animal care and farming practices are being met^{2,3}. They say they're willing to pay a premium if the product is ethically and environmentally friendly; however, this does not always correspond to purchase and consumption practices in the case of welfare-friendly products^{2,4}. They're also increasingly associating good animal care with food quality, and better welfare with a healthier product^{1,2}.

What does the public want?

Although New Zealand's public is not the major customer or consumer of our dairy products, people here are concerned about farm animal welfare and have an influence on national requirements set out in codes of welfare and regulations.

In 2018, DairyNZ surveyed 1000 people to better understand local perceptions of animal care⁵. The survey didn't focus on dairy but on the broader topic of farm animals. What we learned

is that, overall, the public wanted to see happy, healthy, content, well-fed animals. Kiwis' main desire was for animals to have good access to plenty of good-quality feed and water, but the emotional wellbeing of animals was also important.

Something else we learned was people expected animals should be free to roam in large natural spaces, without crowding. The public also wanted to know the industry had strict criteria in place, with regular inspections and consequences for farmers not meeting those standards.

These findings are consistent with a 2016 review of more than 80 scientific articles, mainly conducted in Europe and North America, on public attitudes towards farm animal welfare³. This review identified that naturalness (animals having enough space to behave according to their natural instincts and having access to outdoors and uncontaminated feed) and humane treatment were central to what the public considered to be good welfare. People also thought animals' psychological wellbeing, including being able to express their natural behaviours, was an important part of humane treatment.

What do farmers think?

In 2018, DairyNZ canvassed the views of more than 340, mainly farmer, participants in our nationwide CalvingSmart events. Farmers considered providing a comfortable environment, managing thermal stress, and taking better care of farm employees as the top three things we should work on to improve animal care.

In a further study, 12 farmers with a strong focus on animal welfare identified animals having more control and choice over what they do as an important, but often-missing, element of a cow's life⁶. Examples of 'choice' include forage choice, social groups, and environment, such as shelter.

What do animals really need?

There are many aspects of an animal's life that can contribute to its welfare. Scientists define welfare as consisting of three components⁷:

- health and freedom from illness (biological functioning)
- how an animal feels (affective state)
- and performance of behaviours that they are highly motivated to perform (natural living).

This definition acknowledges that physical needs, as well as psychological needs, are important for cow welfare.

Assessing the welfare of animals is complex because many factors must be considered over time. Health and illness are well understood, and most farmers and their veterinarians have clear goals and management practices to ensure good outcomes. In contrast, we don't yet have the tools to understand fully



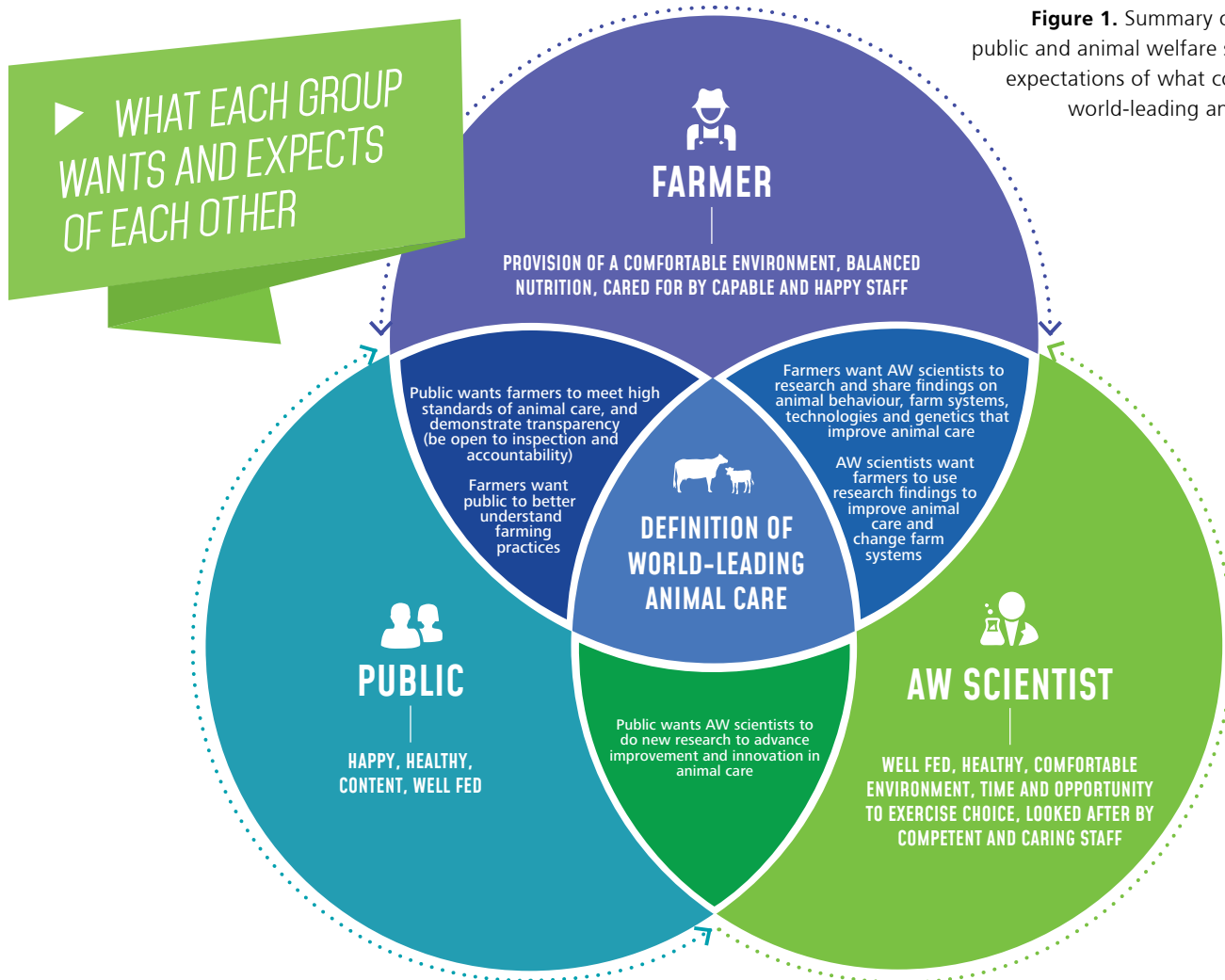


Figure 1. Summary of farmer, public and animal welfare scientists' expectations of what constitutes world-leading animal care

how an animal is responding to its environment, particularly an animal's mental state.

Massey University scientist Professor David Mellor and his team are credited with developing the most comprehensive model for assessing animal welfare⁸. Over 25 years, this group studied the verified scientific literature relevant to animal welfare assessment. They built up a detailed description of the conditions giving rise to specific negative or positive experiences that contribute to an animal's mental state.

The conditions were grouped under four domains (nutrition, physical environment, health, and behavioural interactions), with their associated effects on the mental state of animals (the fifth domain). For example, restricted food intake can result in hunger (negative effect), whereas eating enough food results in satiety (positive effect). The most recent update to this model recognises the positive and negative impacts human behaviour can have on animal welfare – an area farmers identified as important for improving animal welfare performance.

What can farmers do now?

New Zealand dairy farmers are already doing well at protecting animals from negative welfare outcomes. Specific examples include the use of pain relief for disbudding, phasing out

tail docking, and raising calves in groups. Reducing negative experiences, however, is not the same as providing animals with opportunities for positive experiences. Allowing cows choice is one way to satisfy this need. In this regard, having cows outside and grazing pasture is a significant positive, provided the risks around exposure to climatic extremes (e.g., heat, cold, feed availability) are managed appropriately.

The bigger the herd and the larger the farm, the more crucial it is to actively ensure cows have enough time to perform all their important behaviours. On some farms, cows may spend several hours away from the paddock and may also walk several kilometres for milking. Cows grazing pasture typically spend nine to 11 hours lying, seven to nine hours grazing, and six to eight hours ruminating, with periods of ruminating occurring while lying down.

Joint research by AgResearch and DairyNZ at Lincoln University demonstrated that, on days when cows spent more time out of the paddock, they spent less time lying but their time spent grazing and ruminating was not affected⁹. This is supported by previous research showing that time constraints, such as feeding or milking, can influence lying time¹⁰. Cows are strongly motivated to lie down and, when they cannot lie for sufficient time, they show signs of stress, such as restlessness and discomfort¹⁰.

Giving cows sufficient time to attend to their behavioural needs will enable positive welfare opportunities for animals. One example of how farmers have achieved this is implementing flexible milking intervals (such as 16-hour or once-a-day milking), which reduce pressure on the cows' time-budget.

Our strong position

While consumers, customers, the public and farmers place different emphases on what is important in terms of animal welfare, there's general agreement on the key features. Overall, the public wants to see happy, healthy, content, well-fed cows. Farmers have added more detail on how to achieve this, including taking care of staff, because they know how important people are in how well animals are treated. Animal welfare science currently emphasises the importance of positive welfare opportunities and the concept of choice.

The customer-consumer base of our lucrative international markets seek assurance that our production system is sustainable, ethical and trustworthy. New Zealand's pasture-based farming system gives us a strong foundation from which to build that assurance, as we get even better at ensuring our animals have good welfare and, hence, a good quality of life.



References

¹Fonterra Sustainability Report 2020. <https://www.fonterra.com/content/dam/fonterra-public-website/fonterra-new-zealand/documents/pdf/sustainability/2020/fonterra-sustainability-report-2020.pdf>

²Alonso, M. E., J. R. Gonzalez-Montana, and J. M. Lomillos. 2020. Consumers' concerns and perceptions of farm animal welfare. *Animals* 10, 385; doi:10.3390/ani10030385

³Clark, B., G. Stewart, L. A. Panzone, I. Kyriazakis, and L. Frewer. 2016. A systematic review of public attitudes, perceptions and behaviours towards production diseases associated with farm animal welfare. *Journal of Agricultural and Environmental Ethics* 29:455-478.

⁴European Commission. 2007. Attitudes of EU citizens towards animal welfare. Special Eurobarometer 270. Wave 66.1.TNS Opinion and Social. IR

⁵Public perceptions of animal health. DairyNZ internal report. Perceptive. August 2018.

⁶Mills, K., P. Payne, K. Saunders, and G. Zobel. 2021. Findings from participatory workshops with New Zealand dairy farmers. In preparation.

⁷Fraser, D., D. M. Weary, E. A. Pajor, and B. N. Milligan. 1997. A scientific conception of animal welfare that reflects ethical concerns. *Animal Welfare* 6:187-205.

⁸Mellor, D. J., N. J. Beausoleil, K. E. Littlewood, A. N. McLean, P. D. McGreevy, B. Jones, and C. Wilkins. 2020. Review: The 2020 Five domains model: Including human-animal interactions in assessments of animal welfare. *Animals* 10:1870; doi:10.3390/ani10101870

⁹Neave, H. W., J. P. Edwards, H. Thoday, K. Saunders, G. Zobel, and J. R. Webster. 2021. Do walking distance and time away from the paddock influence daily behaviour patterns and milk yield of grazing dairy cows? *Animals* 11, 2903; doi.org/10.3390/ani11102903

¹⁰Tucker, C. B., M. B. Jensen, A. M. de Passille, L. Hänninen, J. Rushen. 2021. Invited review: Lying time and the welfare of dairy cows. *Journal of Dairy Science* 104: 20-46; doi:10.3168/jds.2019-18074.

Good wintering is great farming

Let's winter well for a better future

dairynz.co.nz/wintering

