

Inside Dairy

Your levy in action

WEATHERING EXTREMES

Getting out of a feed fix



Preventing illness
with wearable tech

Tips for spring 'what ifs'

www.dairy.co.nz

DairyNZ 



over the fence...

This issue lands at a busy time on farms and with calving well underway for many.

Welcome to our first bi-monthly edition of *Inside Dairy*. Since our last issue, the DairyNZ levy vote has been completed. We'd like to thank all those farmers who took the time to vote – 57 percent of eligible voters turned out, with 69 percent voting 'yes' to the levy. For volume, 67 percent of milksolids were represented, with a 74 percent 'yes' vote. We're pleased with the turnout, as similar industry votes average 39 percent.

At DairyNZ, we are always striving for more and we're now focusing on next steps. One of our priorities will be increasing our connection with and relevance to all farm businesses. We represent a broad range of farms and farmers. Systems evolve and our job is to support all dairy farms with performance, sustainability and their future.

One key challenge we all face is increasing profit while reducing our footprint – minimising impact on waterways and reducing emissions, in particular. Our team has been working on a new programme, Step Change, to help all dairy farmers increase profit and reduce footprint. You'll hear more about it shortly, but Step Change aims to optimise feed and minimise nutrient loss. Our article on page 11 looks at one of the Step Change recommendations: knowing your numbers.

As we head into spring, you'll be busy managing animals and feed. As this edition shows, for some farmers there'll be feed shortages, and for other farmers there'll be too much pasture. Both scenarios bring challenges. Our cover story explores how two families coped with extremes last spring; other articles offer tactics for managing those unpredictable pasture scenarios.

I also recommend you read our latest Technical Series article (pages 25 to 29), which looks at how wearable technologies might help with improving animal health and welfare.

DairyNZ is your industry organisation and we're always keen to hear from our farmers. Don't hesitate to call or email our team, or contact me on tim.mackle@ceo.dairynz.co.nz

Tim Mackle
Chief executive
DairyNZ



Contents

FEATURES...

2 **Playing the hand you're dealt**

Surviving spring is often about staying nimble and adapting to the feed situation in front of you – whether it's too much grass, or too little.

12 **Managing feed at calving – tips to tackle the 'what ifs'**

Practical advice from DairyNZ farm system specialist Chris Glassey on how to deal with common spring challenges.

25 **Monitoring lying behaviour to improve cow health**

What can wearable technologies tell us about animal health and welfare?

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

ISSN 1179-4909

DNZ03-216



On the cover: Southland farmer Dan Woolsey says weather events left his farm "battered and bruised" last spring – but he survived. Find out how in this month's cover story.

TAKE 5... TIPS FOR FARMERS

1. Free training  More than 300 people have expressed interest in the free GoDairy Farm Ready Training. Your newest employees might qualify for the two practical weeks held throughout New Zealand. See the back page of this issue and GoDairy.co.nz for more info.

2. Heifer grazing sorted? Having a contract in place with your grazier protects you and them, and provides a good platform for clear communication and expectations. As you prepare to send the heifers off-farm once weaned, follow our steps to developing a strong relationship at dairynz.co.nz/contract-grazing

3. Health checks in place  Now's the time to make sure your routine animal health procedures are booked, including bulk milk tank BVD monitoring. Also, keep records of cow health problems to assess levels and determine if you need to make any management changes in the future. Learn more at dairynz.co.nz/cow-health

4. Extra care It's mandatory to use local anaesthetic when disbudding calves. Many farmers also provide more comprehensive pain relief, such as sedation, anti-inflammatories, or topical anaesthetic. If you'd like to do more for your calves too, talk with your disbudding provider. More info dairynz.co.nz/disbudding

5. Take a break  Calving season is always full-on, but that doesn't mean you can't take some time off-farm to get together with others. Keep an eye on dairynz.co.nz/events for DairyNZ's mid-calving and other social events in your area.

IN THIS ISSUE...

- | | |
|------------------------------------|---|
| 9 The roots of rotation planning | 18 Tapping into team strengths |
| 10 Feeding out in uncertain time | 19 Inspired by dairy science |
| 11 Future-fit? Know your numbers | 20 Biosecurity in four easy steps |
| 14 Farmers feed into FVI results | 21 Animal matters |
| 15 Dairying's sustainability stars | 22 Just quickly |
| 16 Spring into action on effluent | 23 Regional update |
| 17 Stepping up to the plate | 25 Technical Series: Monitoring lying behaviour to improve cow health |



We appreciate your feedback

Email insidedairy@dairynz.co.nz or call us on 0800 4 DairyNZ (0800 4 324 7969). Alternatively, post to: Inside Dairy, Private Bag 3221, Hamilton 3240. For information on DairyNZ visit dairynz.co.nz.



PLAYING THE HAND YOU'RE DEALT



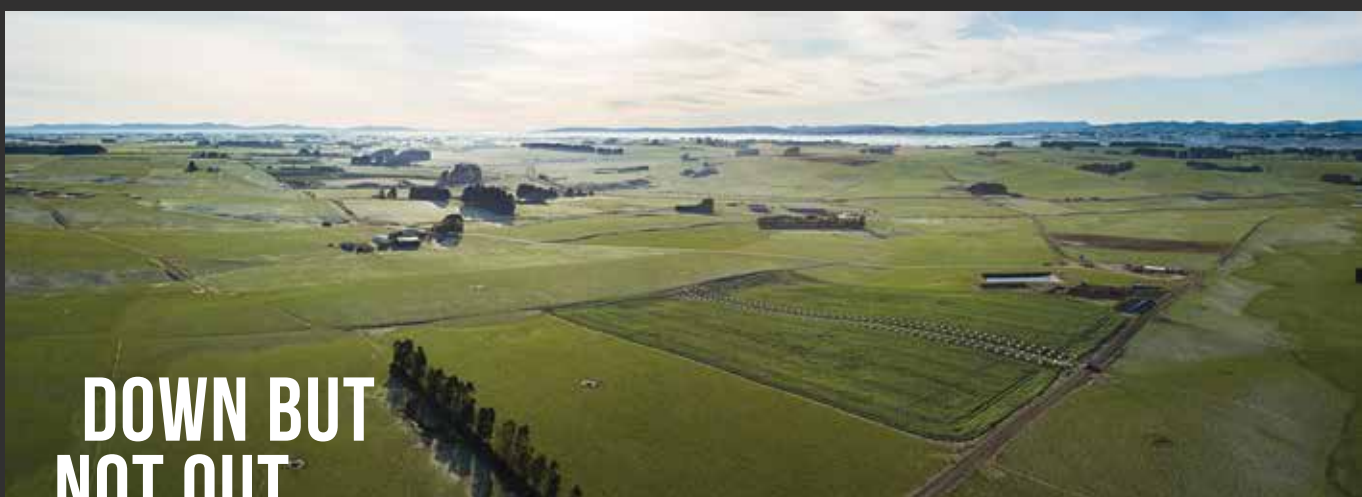
Dan Woolsey says last spring was hard on his land, his animals and his team. Careful pasture management decisions, which Dan says were often made "on the hoof", got them through it.



Dan and Emily Woolsey, with sons Jack, 8, and Carter, 10 (main photo); Klaas and Annette Groen, with daughter and operations manager Lisa Groen (inset).



Last spring, variable weather conditions around the country led to two quite different feed management scenarios. While Southland farmers Dan and Emily Woolsey had to manage their way out of a tight spot, the Groen family were facing more grass than they could cope with in the Waikato.



DOWN BUT NOT OUT

In Eastern Southland, fifth generation farmers Dan and Emily Woolsey are in an equity partnership with Dan's parents, Leicester and Andrea. Dan, who manages the farm, says weather events last spring left them battered and bruised – but they survived.

One of the things Dan most enjoys about farming in Southland is its consistent seasons. June, July and August are generally Southland's lowest rainfall months, but at that time of the year there's no drying. Once the rain starts, it generally doesn't begin to dry out until late September, when the spring equinox arrives

"We're not in a drought zone, so generally speaking, we always have grass to feed our stock. Our cows in milk only eat grass. We winter 25 percent of our herd at home on fodder beet and brassica crops (30ha) grown on the dairy platform."

Rain, rain and more rain

But last spring was an exception, says Dan.

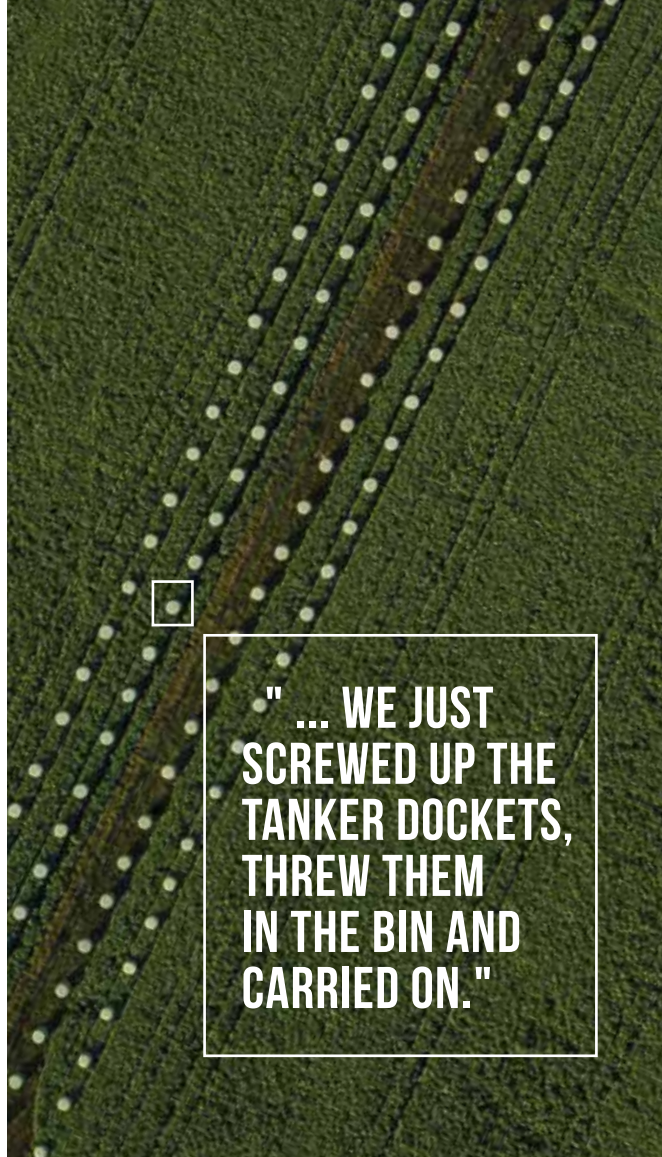
"June and July were quite wet, so soils were at field capacity come the first of August, when we started calving. That was followed by a couple of snowstorms, and basically it never stopped raining until November."

Southland's prevailing weather comes straight from Antarctica, with driving rain and biting wind. Last spring, low temperatures sat around 1 to 3°C and highs barely exceeded 10°C. Dan says he could count on one hand the days without rain between August and November.

Damage control

Dan says he and his team of seven simply put their heads down and got on with it. They made plans A, B and C. They tried to minimise pugging damage by taking cows in through a back gate, grazing the paddocks from the back to the front, and even shifting cows in the middle of the night. They also had to pick up calves twice in the night; otherwise they may not have survived.

"We kept all cows on once-a-day for the first month of calving. As far as production went, we just screwed up the



"... WE JUST SCREWED UP THE TANKER DOCKETS, THREW THEM IN THE BIN AND CARRIED ON."



FARM FACTS

OWNERS: Dan & Emily Woolsey (pictured on left with sons Carter and Jack, and their English spaniel, Pip.)

LOCATION: Gorge Road, Eastern Southland

HERD SIZE: 1250 (peak) Jersey-Cross

FARM SIZE: 430ha (effective)

SYSTEM: 3

STOCKING RATE: 3 cows/ha





Dan: "... basically it never stopped raining until November."

tanker docket, threw them in the bin and carried on," says Dan.

"We just did the best with what we had. We were five percent down on budget at the end of the season, but 10 percent down on the previous year."

During these challenging times, Dan kept in touch with DairyNZ consulting officer Nathan Nelson to bounce ideas around and learn about what other farmers were doing.

"It was good to have someone to talk to, but you still had to go out and make it happen."

Out of kilter

The bad weather had a big knock-on effect. Because Dan and his team couldn't do everything at once, they decided to prioritise planting fodder beet. They usually plant in October but couldn't do so until the middle of November. Similarly, brassicas normally planted in December weren't planted until early January.

Supplements made on-farm are generally made before Christmas. Normally this would be 1000 bales of baleage, but they made only 400 and had to buy in more to fill the deficit.



Dan uses a tow-behind pasture meter weekly to monitor pasture growth and average pasture cover. "It allows us to measure the entire farm in three hours."

Decisions in the balance

Dan says it was important to stick to their desired round lengths through spring. They calculated how much feed was being eaten daily, and how much was on hand, and allocated it accordingly. That meant they wouldn't run out of feed on predicted balance date – generally October 1 for them.

"We came around to balance day with 1750kg DM/ha cover. My ideal cover would be 2100 and that's the day we'd normally speed up to a 22-day round, but we stayed on a 30-day round until October 20 and moved to a 22-day round leading into mating. To weather the storms, I have a golden rule: never go faster than 22 days."

These decisions helped because the farm still had grass and not too much pasture was damaged.

Another management decision was to stand cows off once they'd finished their feed allocation. The farm has several concrete stand-off pads covered in woodchip.

None of the cows eat grass until they're in milk, so Dan has an "insurance policy and it's called a stack of silage". Cows stay on crop until they're ready to calve, when they're moved to a calving pad and fed silage. Once they've calved, they go onto grass.

"I keep 200kg DM/cow in the stack at any time and we used it all between September and November. Our start of mating was November 1, when we had two weeks of good weather, which put some sun on the cows' backs and we finally got some grass growth. Then we got beaten up again until Christmas."

After the big wet, the Woolseys did some undersowing on damaged soils, drilling perennial ryegrass into the pasture. "We re-grass 8 to 10 percent of the farm a year too, and the winter crops help with that because once they're finished, they go into grass," says Dan.

Out of the storm

"Cows are amazing animals – they're resilient. We were battered and bruised by the weather, but you wouldn't know it now. We kept focusing on the future and feeding our cows the highest quality pasture every day. Overall, it wasn't an entirely

disastrous season, but it had the potential to be."

Dan says the cows came through it and mated well. "They're looking really good now. We put them on once-a-day between April 1 and June 1. This was triggered by the fact that too many cows weren't going to make calving condition, so that's when we looked at reducing milking frequency to help get some weight on the cows. Being all grass, milking frequency is the one tool I have."

Keeping morale up

Rough weather makes everything harder, and Dan says last spring was tough on people as well as animals.

"Morale and mental health were helped by get-togethers for a meal at the local pub and a few beers and a barbeque in the workshop. We did that a couple of times with the team and I'm pleased to say they're all still with us. It's been a challenge for everyone, but we all got through it.

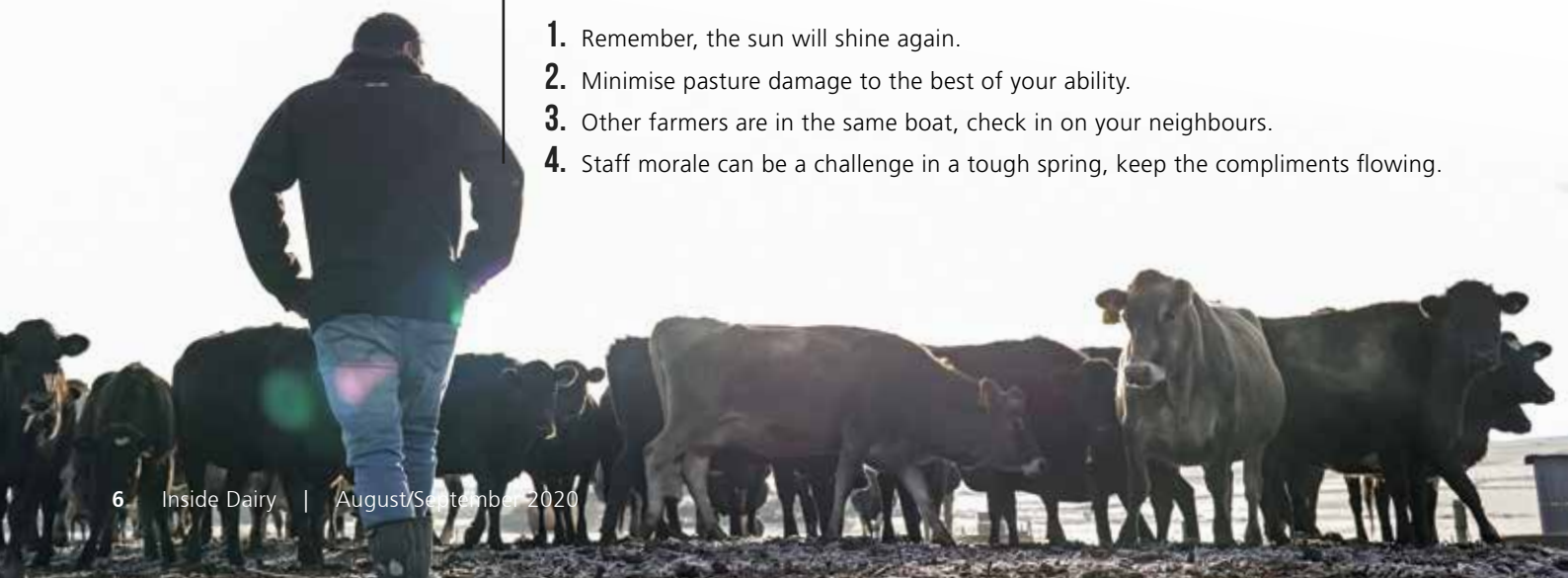
"To be honest, the rest of the season has been tough going too, because we haven't had rain or sun when we need it, and pasture growth is the lowest it's been in the last 10 years.

"But I've learned that the rain will stop, and the sun will come out. Southland will get you down, but it won't let you down."



THE WOOLSEYS' TOP TIPS

1. Remember, the sun will shine again.
2. Minimise pasture damage to the best of your ability.
3. Other farmers are in the same boat, check in on your neighbours.
4. Staff morale can be a challenge in a tough spring, keep the compliments flowing.



“WE DIDN'T PLAN TO MAKE SILAGE AT THAT TIME OF THE YEAR – IT JUST PANNED OUT THAT WAY.”

GAME PLAN FOR A GRASS GLUT

In the Waikato, things couldn't have been more different. Towards the end of last August, Klaas, Annette and Lisa Groen found themselves with a pasture surplus.

The Groens have been farming for 20 years on flats in the shadow of Mount Te Aroha. Klaas and Annette arrived in New Zealand in 1983 with a couple of suitcases and have worked their way up the dairy ladder. They were Waikato Sharemilkers of the Year in 1990, and in 1999 bought what Klaas describes as “our small piece of dirt”. Their daughter Lisa is gradually taking over the running of the farm.

Surplus to demand

In the 2018/2019 season, the Groens dried off on April 30 after a very dry autumn and were able to keep their heifers away until June 20. Once the rain came in late autumn, they grew quite a bit of grass and a mild winter saw growth rates above demand through until August, when average pasture cover reached 2750kg DM/ha. They were on a 90-day round (grass only) while the cows were dry through winter.

Lisa says they were fortunate to have a window of fine weather in late August and that's when they decided to make their first lot of silage. Throughout September, they made some more. Balance day on the Groen's farm is generally around September 1.

“We didn't plan to make silage at that time of the year – it just panned out that way. We had favourable dry conditions allowing us to tedder the silage. It meant we were able to get contractors in with heavy tractors and loader wagons and we didn't damage the pastures. It worked out well,” says Lisa.

Weathering change

Klaas says the weather controls everything they do, so it's all about reacting to it and making adjustments – like they did last spring.

“We want to keep growing grass all the time. The thinking behind it is you've got a piece of dirt and you want to grow as much grass on it as you can. There's always a bit of fine-tuning and that's dictated by the weather. The farm isn't big, so we see it every day. Our eyes are always on the prize.

“The decision-making analogy is that you know how much grass you grow per day, so you know when there's going to be a

surplus. We made enough silage (60ha) to get close to 300 days milking from it.”

The Groens have a short calving period of 10 weeks. The cows are calved on the pad that's used for silage in the summer. Lisa says they speed up the rotation after calving but don't go any quicker than 25 days. That allows them to have 10 to 15ha out at any one time for silage, which they make about six times a year, generally every three to four weeks between September and December with a focus on quality over quantity.

In total, the Groen's made 60ha silage last season, which was 120t of DM, topped up with meal. They use 463t of meal and their focus on milksolids response dictates what's in the meal mix. Lisa says they're not great fans of PKE, so use less than 10 percent in the pellet blend.



FARM FACTS

OWNERS: Klaas & Annette Groen

OPERATIONS MANAGER: Lisa Groen

LOCATION: Te Aroha, Waikato

HERD SIZE: 240 Jersey & Kiwi-Cross

FARM SIZE: 65ha (effective)

SYSTEM: 3-5 depending on milk price and weather throughout the season

STOCKING RATE: 3.7 cows/ha

PRODUCTION: 125,800kg MS/year (1935/ha)
(524kg MS/cow)



The Groens' ryegrass pastures are 40 to 50 years old, with yarrow in the sward. They add clover, plantain and chicory to the fert mix.

Never too much grass

Even though they grow a lot of grass, the Groens still use nitrogen (N) fertiliser.

"We need to grow as much grass as we can before before Christmas, so we still put N on because grass is the cheapest feed you can have, and we need to have enough feed in the summer months to carry us through. From the day we start calving, we 'trickle' N on. Not huge amounts – maybe 30 to 40kg/ha," says Klaas.

The Groens use 250 units of N/ha/year but next year this will be reduced by 15 percent when the new environmental regulations come into effect.

Pre-graze mowing has also helped the family to maintain pasture quality and allow more tillering.

"As far as I'm concerned, we can never have enough grass, so we keep it growing to maximise pasture harvest while the conditions are right, and push that feed through until the drier months. You know what quality silage you've got because you've made it on-farm," says Klaas. This approach allows the Groens to milk for longer in the autumn.

"One of our key performance indicators is days in milk, but it has to be profitable," says Lisa.

Klaas agrees: "At the end of the day, we're all here for the dollar. We're not here to make a loss. Of course, there are certain times of the year when you might break even weather wise, but if you look at the big picture, we still get close to 300 days in milk and that's where our profit comes from."

The farm has all old pastures, with no cropping or re-grassing. This means the soil structure is in excellent condition. Soil tests are carried out every two years to ensure that phosphorus, potassium and sulphur are in the optimal ranges.

The Groens aim to grow 15 to 17t DM/ha every season, with a focus on pasture utilisation at 85 percent.

When *Inside Dairy* visited in July, the Groens were on a 75- to 80-day round with over 2700kg DM/ha average pasture cover (APC). Lisa says that when they dried off on May 26, they were at a 90-day round on all grass and the heifers came home on June 1.

"We've had to speed up the round because the grass is still growing, so we're in the same position as we were this time last year. So, if the weather cooperates, we could be making silage again at the end of August," says Lisa.

Farm and family

For the Groens, farming is about quality of life. Running an uncomplicated system means they can enjoy the best of both worlds.

Lisa, Annette and Klaas sit down every month to make a plan. They discuss what pasture they've got, what might happen weather wise in the next four weeks and what the growth rates are. As a guide, Lisa monitors growth rates in the area and compares notes with the neighbours.

"We're not working all the time," says Lisa. "We have a good lifestyle balance, which gives us the time to make good decisions and do things properly."

Klaas couldn't agree more: "For us, being a family farm, quality of life is important. It's got to be enjoyable."

■ Author: Christine Hartley

THE GROENS' TOP TIPS

1. Keep your system simple. Even though we're a System 3 to 5, grass is our focus.
2. Look after your pasture all the time, and maximise growth because it's the cheapest feed you have.
3. Be proactive and make decisions early.
4. Set up your paddock layout for ease of pasture management and control.
5. Always know stock feed and demand; and monitor growth rates and supplement availability to match the feed demand and meet your production and profit targets.



The roots of rotation planning

With many farmers facing pasture shortages this spring, now's a good time to revisit the four pillars of grazing management identified at Ruakura in the 1980s, writes DairyNZ's Chris Glassey.



Planning is crucial when it comes to feed, especially when we're facing high pasture deficits, like this season. How we manage this situation has its origins in the 1980s. That's when Dr Arnold Bryant and his team completed three trials at Ruakura, studying winter and spring pasture rotation lengths and milksolids production. This led to the creation of DairyNZ's Spring Rotation Planner (SRP).

Dr Bryant identified four important system-level factors to optimise winter-spring grazing management. Two were strategic (optimum calving date and stocking rate) and two were tactical (autumn/winter pasture allocation and its effect on average pasture cover at calving; and the principles of the SRP).

The SRP (dairynz.co.nz/srp) assigns a grazing area per day, increasing daily from the start of calving until balance date (when pasture growth exceeds herd requirements). The aim is to control the rate of pasture cover decline during this period.

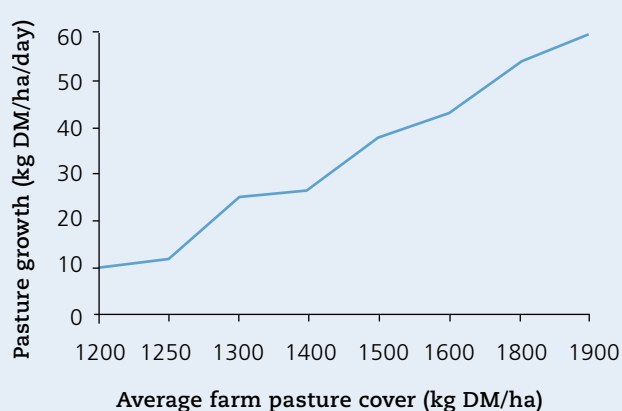
Initially the area allocated is small because all cows are dry, but as more cows calve, the allocated area is increased. Available supplement is best used to control the length of rotation early in calving (feeding the pasture wedge and not the cow), rather than managing a large pasture deficit with supplements later in calving period.



The trials

In the first trial, farmlets were managed with different rotation lengths over autumn and winter, creating a large range in pasture quantities (1800 to 2400kg DM/ha) on each farm at the start of calving. All farmlets were then managed similarly

Low average pasture cover restricts spring pasture growth rates



Data is from the Ruakura Trials, 1980s.

from calving. The amount of pasture in July or August at calving wasn't consistently related to total lactation production. So, why was this difference in feed on-farm at calving not expressed in a milksolids advantage?

To answer this, a second trial imposed different rotations after calving on the different winter rotations. The cows were either exceptionally well fed (very fast rotation) or had their feed rationed (very slow rotation). Bryant and L'Huillier (1986) noted that maintaining a slow rotation after calving returned pasture covers on the farm to target levels much sooner than a fast rotation during a spring pasture deficit.

The third set of trials identified that the faster the rotation in late winter/early spring, the less pasture is grown. Ryegrass requires a third new leaf development to reach maximum growth rates and also to replenish energy reserves in the base of the plant; grazing too often stops this process, depleting energy reserves and substantially reducing regrowth. You can see this pattern in the graph above.

Even though feeding cows more pasture seems like the right thing to do when feed is short (fast rotation), it extends the period of lower covers and the time of underfeeding as mating approaches. Feed shortfalls tend to be filled with supplements, which always cost more than any pasture that would have grown if a longer rotation had been maintained.



DairyBase data shows that if the milk price drops, reducing total feed costs should be a top priority.

Feeding out in uncertain times



Although recent movements in the Global Dairy Trade auctions have been positive, there remains large uncertainty in the forecast milk price. DairyNZ's Maitland Manning has some advice around pasture and imported feed.

At the time of writing, we're seeing a wide range in the predicted milk price, from \$5.40 to \$6.90/kg MS, with a 20-year average milk price of \$6.35/kg MS. This has led to several agricultural analysts recommending dairy farmers develop a 'plan B'.

Data from DairyNZ's DairyBase shows that pasture and crop eaten per hectare is a determinant of profit, with imported feed being one of the biggest costs on the farm. So, if the milk price drops, reducing total feed costs should be a top priority.

Two ways to reduce total feed costs

1. Be prudent about purchasing imported feed

There is no advantage to replacing good-quality pasture with a purchased imported feed. Maximise the herd's milk production response by offering imported feed only when you're facing a feed deficit (post-grazing residual less than 1500kg DM/ha). Feeding imported feeds when residuals are high also reduces future pasture growth rates and quality, and increases costs.

Is your imported feed maintaining a higher stocking rate to produce more milk? When the milk price is low, using imported feed to produce milk does not guarantee a greater profit. Consider the total cost of the imported feed, which includes the purchase price, wastage, capital, fuel/energy, labour, repairs and maintenance. This can add 50 percent more to the imported feed cost.

Also, remember that using imported feed to increase total feed eaten/ha increases total methane emissions.

2. Maximise your pasture harvest

To achieve a high pasture harvest, carry out regular pasture assessment, identifying upcoming deficits and surplus, and make decisions early. Aim for consistent post-grazing heights of 1500 to 1600kg DM/ha (seven to eight clicks on the rising plate meter).

Also, when making pasture management decisions, consider the impact on pasture across the season, not just at any one grazing. Keep average pasture cover above 1800kg DM/ha in early spring and between 2000 and 2400kg DM/ha for the season to maximise pasture growth rates. To maintain pasture quality, target the two- to three-leaf stage by matching grazing rotation length to pasture growth rates.

Lastly, apply nitrogen fertiliser when it will maximise pasture growth or help to fill an upcoming feed deficit.



Tools that work

DairyNZ offers some excellent resources to help you plan when and how much imported feed your farm might need. Check them out:

- Feed management tools – dairynz.co.nz/feedtools
- Simple budget templates and guides – dairynz.co.nz/budgeting-tools

FUTURE-FIT? Know your numbers

Being prepared for the future means 'knowing your numbers' in relation to both profit and environmental performance.

To thrive in future, a farm business will need to not only meet its owners' and team's financial and lifestyle needs, but also meet its environmental obligations. Being prepared starts with knowing four key numbers, which will give clarity on whether you may need to make any changes to your farm system.

Financial

The first two numbers are the key components of business resilience.

1. Operating profit/ha

This key performance indicator (KPI) indicates the 'engine room' of your production system. How financially profitable is your current system? The more profitable the system, the more opportunity for financial progress.

2. Debt to asset ratio

This is your level of debt relative to the value of assets in your business. It's an indication of your business's exposure to market 'shocks', like a drop in milk price, increase in interest rates, or decline in asset values.

Then, compare these two numbers. If you have a high debt to asset ratio, you'll need higher profitability to manage the risks associated with your debt position. If you have low profitability and a high debt to asset ratio, you're probably too exposed to be financially resilient to the farm system changes required to meet environmental commitments. For ideas on what you can do now visit dairynz.co.nz/stepchange

Environmental

The other two numbers are metrics for water quality and greenhouse gas. These numbers can be sourced from Overseer or your dairy company.

3. Tonnes of methane/ha

This is a priority reduction area because 81 percent of New Zealand's biological greenhouse gas emissions come from methane.

A key driver of methane emissions is total feed intake on-farm. If you know your dry matter intake you can calculate methane emissions.

4. Purchased nitrogen (N) surplus/ha

Nitrogen surplus is a key driver of nitrous oxide emissions (which makes up 19 percent of New Zealand's biological emissions) and N loss to water (one of the four primary measures of water quality).

When making farm system changes, your environmental goals should be to lower methane emissions and purchased N surplus, while maintaining or increasing profit to meet the needs of the business owners.



Need help
calculating your
numbers?

Visit
dairynz.co.nz/stepchange

627-1682

Managing feed at calving – tips to tackle the ‘what ifs’



Matching feed supply and demand at calving time can be tricky, especially following a prolonged drought and/or delays in culling. Check out these tips from DairyNZ farm system specialist Chris Glassey.



Pasture covers, body condition score and supplement levels are highly variable at this year's calving throughout the country, on the heels of prolonged drought, delayed culling and a mixed bag of weather for recovery during winter. On many farms, one or more of these important indicators is lower than usual right now.

As well as those issues, we have forecasts of a reduced milk price, which changes the economics of responding to these situations. Doing what is usually done may not be appropriate. Smart management of cash and feed resources will help you avoid going down a risky path towards higher costs and lower cash flow. Use these 'what if' tips to stay on track.

Q. What if pasture cover is below target at calving?

- Grow your way out of trouble by managing available pasture accurately to add the best value to the situation in the longer term.
- Use the Spring Rotation Planner (dairynz.co.nz/srp) to increase, hold or control the rate of decline in pasture cover (see article on page nine).
- Use supplements and a long rotation length to improve pasture growth.
- Later in the calving period, as balance day approaches (when pasture eaten = pasture growth), stay on at least a 25-day rotation. Rotations faster than this grow less grass and mean a longer time spent in pasture deficit.
- Buying supplementary feeds could help but shouldn't be the focus. They're expensive and in short supply. Be flexible, as a heavy reliance on supplements could lead to higher costs and lower cash flow, as they quickly become unprofitable when pasture covers improve and pasture is left behind in the paddock.
 - Check out the supplement price calculator (dairynz.co.nz/supplementcalc). If you have very low feed covers, the calculator can be used to determine

whether PKE, landed on-farm for less than \$330/tonne (37 cents/kg DM), can be profitably fed in early lactation.

- It's profitable only when grazing residuals without supplement are less than 1400kg DM/ha.
- Your milk needs to stay within Fat Evaluation Index limits.
- Using nitrogen (N) fertiliser and gibberellic acid (GA) will promote pasture growth more cost-effectively than supplement.
- During early spring, urea can supply additional DM at a cost of 16 cents/kg DM, assuming a cost of \$1.60/kg N applied and a response of 10kg DM/kg N.
- N and GA applications require good planning for timely applications. They also need a long rotation to allow their value to come through.

Q. What if pasture covers are low but imported feed costs are high?

It's risky to lock into contracts for importing feed when milk price forecasts are low. Do your cash flow budgets carefully for the options. Include budgets for any change in stocking rate or milking frequency.

- Consider going to once-a-day milking. It may add more value for money than buying feed, and be financially more sustainable. This depends on the size of any potential cost savings relative to revenue reductions.
- Reducing stock numbers on badly impacted farms should also be considered. This could take several forms:
 - A temporary shift of milking cows to another farm where they can be fed and milked on your behalf until a recovery occurs. (Be sure to follow biosecurity guidelines.)
 - A permanent reduction in stocking rate through early culling.

These options come with risks.



Reasons for considering further culling

- More available feed for remaining stock.
- Potential for cost savings greater than any revenue lost.
- Adjusting to a 'new normal' for the farm's pastures and feed resources (has feed demand consistently been greater than feed supply in recent years?).
- A reduced stocking rate required for higher feed demand from improved herd genetics.

Risks of reduced stocking rate

- Less profit. Revenue reduction is greater than costs saved.
- Increased pasture surpluses, including costs of harvesting surpluses and retaining suitable pasture quality.
- Impacts on balance sheet, sale of capital stock and/or tax considerations.
- Getting a poor price for stock.
- Reduced opportunity for future expansion of herd, due to feed demand (see feature box top right).

Q. What if winter growth exceeds expectations, and results in high pasture cover?

- Review your need to feed supplement during the calving period.
- Increase the pasture allocation, but not at the expense of target grazing residuals.
- There may be opportunities to harvest early surplus grass for silage (see our cover story for an example of this).

Herd genetics and feed demand

As the herd improves through breeding, feed demand also increases. DairyNZ estimates that at normal rates of genetic gain, feed demand per cow increases by 0.4 percent per year (four percent over 10 years).

Key points

1. No two spring calvings are the same, so focus on and respond to the situation in front of you.
2. Focus on matching feed supply to demand as best you can.
3. Focus on pasture management to minimise this season's impact on cash flow and herd mating performance.
4. Know your situation and assess any gaps relative to where you'd like to have been.
5. Do the same with this season's cash budget – and consult with your financiers. What can and can't you afford?



Farmers feed into FVI results

As DairyNZ continues testing the Forage Value Index (FVI) through validation trials, farmer input is proving hugely valuable.

Since 2012, DairyNZ and research partners have been developing the FVI to provide farmers with a guide on selecting pasture types to best suit their farm while maximising productivity and profit. The next stage of this work, the FVI Validation (FVIV) trial, is being carried out at DairyNZ's Scott Farm, near Hamilton.

FVIV project leader Dr Jane Kay says the validation trial involves five experimental high-ranking cultivar farmlets (pastures sown with high-ranking FVI perennial ryegrass cultivars) and five farmlets of low-ranking cultivars. The 10 farmlets are being compared across all aspects of pasture and animal performance and, ultimately, profit.

Seasonal variations

Dr Laura Rossi, who is analysing the FVIV experiment as part of her post-doctoral studies, says the first two summers of the experiment were dry (extremely so, in 2019/20). Although the two cultivars began to diverge in growth rates as predicted, with the low FVI cultivars growing more in spring, and the high FVI cultivars growing more in winter and the start of summer, the net gain in pasture eaten for the high versus low FVI systems was less than expected.

The severe dry conditions restricted any additional growth from the high FVI cultivar during summer/autumn, says Laura. That means there was less opportunity to reduce supplement costs post-Christmas, or gain days in milk from high FVI pastures as predicted.

Farmer input

"Having local farmers offer our project team their advice in relation to the FVIV Scott Farm trial has added greatly to the rigour of this work," says Jane. "They're also keen to see the experiment continue over multiple years, as they say there's no such thing as an 'average' business season – or farm – in their districts."

One of those Waikato farmers is Te Miro's Alistair Hall, who says: "It's good to know the FVIV trial will give farmers realistic data they can trust and that's been well proven in a realistic farming environment, so we can make re-grassing decisions suited to our farming systems."

Another member of the farmer advisory group, John Assen from Taupiri, agrees: "It'll also mean my investment into sowing high-producing cultivars won't be money down the drain. Further validation of growth rates will also enable us to better forecast our expected pasture production and more closely match feed demand with pasture supply."



Next steps

The FVIV trial will continue for at least one more full season. Upon completion, aspects of the FVI system may be adjusted to better reflect the value of genetic gains in ryegrass to New Zealand dairy farms.

Find out more about the FVI project at dairynz.co.nz/fvi

Dairying's sustainability stars

Starting a community nursery, developing wetlands, and planting out waterways are just some of the ways award-winning dairy farmers are showing exceptional care for the environment.



For Chris and Desiree Giles, building a sustainable farm business isn't just about what happens on their farm. The couple, of Waimumu Downs equity partnership near Gore, run a 550-cow farm that's the hub of a community environmental project.

"As part of the Waimumu Downs Project, we're working with local Enviroschools, our catchment community and local iwi to start a community nursery," says Chris.

The plan includes schoolchildren propagating local seeds at the farm and carrying out stream and biodiversity studies.

In recognition of their outstanding work, Chris and Desiree won the DairyNZ Sustainability and Stewardship Award at the Southland Ballance Farm Environment Awards.

The couple have also developed four wetlands, which farm drains flow into, and they've planted farm waterways.

"We would like to develop a native plant corridor from the Maitua River to the Hokonui Hills and get other neighbouring farms on board with this," says Chris.

The Gileses and Environment Southland have been trialling using straw bales and woodchips to filter sediment and nutrients going into wetlands. This has resulted in a 47 percent average reduction in total nutrients leaving the wetlands.



Meanwhile, in Taranaki, the Bourke/Smith family's care for their farm – which has been in the family since 1873 – was also recognised with an award.

Fern Flats is a 73ha, 180-cow farm run by owners Robert and Verna Bourke, with sharemilker daughter Conna

and son-in-law Nick Smith.

"We have a gully in the middle of the farm which used to be grazed by heifers, but it wasn't very productive," Robert says. "After attending farm forestry field days, I saw how planting could help manage this area and beautify the farm."

Extensive planting in the gully has created a 12ha pine forest. Another four to five hectares of riparian margins have been planted with native species. A farm wetland provides a pukeko habitat.

Testing shows that water from two springs on the farm is good enough for the family to drink.

Robert says there's plenty of advice on offer for farmers who want to improve their farm environment, including from regional councils and farm forestry field days.

DairyNZ also hosted a discussion group on the farm, which provided Robert with expert advice on improving his effluent management system.



Regional winners

Congratulations to the other DairyNZ Sustainability and Stewardship Award winners at the 2020 Ballance Farm Environment Awards:

- Otago – **Sandra and Chris Campbell**
- Waikato – **Damien Watson and Joan Barendsen**
- Horizons – **Mark Johnston and Rebecca Jeffery**
- East Coast – **Ryan Sanderson and Malinda Wynyard**
- Canterbury – **Tony Coltman and Dana Carver** (also winners of the Canterbury Supreme Award)
- Wellington – **Aidan Bichan, Neville Fisher and Vern Brasell** (also winners of the Wellington Supreme Award)
- Northland – **Grant and Danielle Petterd**
- Auckland – **Keith and Jenny Trotter**

Spring into action on effluent

Sound effluent management can get overlooked during busy times like spring. Use our checklist and farmer tips to stay on track with your effluent compliance.

Compliance checklist

- If you've moved into a new area, do you understand the local compliance requirements?
 - Check out the PrimaryI/O effluent management courses – Dealing with Dairy Farm Effluent and Effluent Management Planning.
 - Do you have a copy of the effluent consent, if you need one? Does your farm team understand it?
 - Have you completed a compliance checklist? It's useful to pre-empt a compliance inspector's findings and as a staff training aid too. Visit dairynz.co.nz/checklists
 - Update your Effluent Management Plan, including its emergency names and numbers. Get a template and order an effluent management plan poster from dairynz.co.nz/effluent
 - Get effluent management prompts on that webpage and download DairyNZ's *A Farmer's Guide to Managing Dairy Farm Effluent*.
 - Write standard operating procedures for effluent management. Include a contingency plan for when things go wrong.
- Maintenance, review, monitor**
- Regularly review the performance of your effluent system with the team, so its standards are understood and maintained.
 - When soil moisture and weather conditions permit, irrigate to keep the pond low, especially as summer approaches. Avoid applying effluent when soils are too wet.

Tips from farmers

Here's how these two farmers manage effluent during the busy spring period.



Melissa Slattery,
Te Aroha, Waikato

- Have appropriate storage, so you don't have to irrigate when the conditions aren't right.
- Complete all needed maintenance and servicing so everything works as it should.
- Have all your procedures up to date and all staff aware of them.
- Have an emergency plan for when things go wrong.



Jared Watson,
Opotiki, Bay of Plenty

- Laminate your resource consent, have it easily available and make sure everyone is aware of the rules.
- Make sure everyone understands the importance of correct hose layout, so it runs properly and minimises wear and tear.
- Understand the ability of a soil to take in effluent. Knowing this is very important if you want to stay within your consent conditions.

Stepping up to the plate

2019 Dairy Woman of the Year Trish Rankin says we've yet to reach our potential in selling New Zealand dairy's unique approach to food production and animal care to global consumers.

Taranaki sharemilker Trish Rankin says New Zealand's milk and meat farmers are outperforming overseas competitors in three key areas: animal health and care, the quality and health benefits of our products, and our sector's approach to environmentally sustainable farming practices. Yet after attending a recent agribusiness conference at Harvard University, she's concerned that most of the world isn't aware of it.

"Of the 200-odd agribusiness leaders of the world attending that conference, very few of them – apart from the Australians – knew that my cows lived outside and didn't get fed antibiotics 'ad-lib'. That was shocking to me," says Trish. "Our sector – and individual farmers – need to get the right marketing messages out there if we want to gain more supermarket shelf space here and overseas."

"The real premium is keeping our place on the shelf."

She adds that in a post-Covid-19 world, it'll no longer be just about what global consumers expect, it'll be about what they can afford. Trish also believes now's not the time to get too hung up on earning a premium for New Zealand's dairy products. Rather, it's about emphasising their value and quality while offering them at a realistic price. "The real premium is keeping our place on the shelf."

Trish also has some interesting views on what plant and laboratory-based food producers are trying to achieve, after hearing from them at the Harvard conference.

"Their marketing isn't around, 'hey vegans and vegetarians,



Trish Rankin says better awareness of NZ's meat and milk sector practices and product quality is needed to get us more supermarket shelf space here and overseas.

here's a meat-like product for you'; it's very geared towards, 'hey meat eater, we know you want to do something that's better for your health, the planet and for animal welfare – so come and eat our product'.

"I think that's where New Zealand could hit the same market. The way we actually make our meat and milk in New Zealand is way superior to what the customer over in America gets – they're just buying ground beef and eating an average four hamburgers a week.

"Without market access, we can't sell our products," says Trish. "To get the best market access, we need to be the best farmers in the world, doing things our way, making sure we look after our animals, our people, the environment – and making sure people know about it."

Trish says that continuing to raise the bar on producing the highest quality and most valued dairy nutrition, being world-leading in on-farm animal care and focusing on environmentally sustainable practices are just three ways New Zealand's dairy sector offers all consumers great choices.

"We just need to make sure they know about them before they choose what's going on their plates tonight."

Tapping into team strengths



DairyNZ's Jane Muir explains how a well-led, engaged and committed team can make all the difference to overcoming challenges, especially when everything's happening at once.

"Sharing strengths, support, trust and clear communication really count when it comes to creating and maintaining effective teams," says Jane, DairyNZ's people team manager. "That's particularly crucial when things get hectic – whether that's during the busy calving season – or when the totally unexpected happens, like the Covid-19 pandemic."

When Covid-19 hit New Zealand earlier this year, one of the hottest topics for the farming sector was people issues, says Jane.

"We realised some of our migrant staff were overseas, so we wouldn't have enough employees on our farms. Farmers would also need to farm during Covid-19; managing 'bubbles', physical distancing, adding extra cleaning regimes and more."

Jane, along with DairyNZ's acting general manager of farm performance, Sharon Morrell, set up a Covid-19 working group with sector partners, aiming to support farmers on people issues during the crisis. It included three Federated Farmers representatives – chair Chris Lewis, plus Ewan Kelsall and David Cooper – and Jules Benton from Dairy Women's Network. The group met online every morning during the lockdown.

"We couldn't afford to have duplications or miss things. We wanted to show an efficient, united front to farmers, with clear messaging, plus identify top priorities to sort daily while also focusing on planning for a changed future," says Jane.

As well as working on immigration and workforce challenges, the group put together Covid-19 online information for farmers (see dairynz.co.nz/covid19). They were also part of the group who got Government approval so June 1's Moving Day could go ahead and created the associated resources (see dairynz.co.nz/movingday).

DWN's Jules Benton says the group's collaboration and openness, and its focus on actions and solutions was a highlight. Feds chair Chris Lewis agrees: "Bringing new people to discussions on specialist subjects also brought a fresh perspective and generated new approaches and ideas. Definitely a win-win and something I do on-farm myself."

Jane says everyone appreciated sharing a laugh from time to time, which helped keep them positive and effective. "Another plus was that many farmers phoning us told us they were



On deck and online: DairyNZ's Covid-19 working group in action.

really grateful to get to talk directly to someone who had the information they needed.

"Whether it's calving or Covid-19, any team's effectiveness relies on the kind of commitment our group members and sector partners showed towards what we were trying to achieve," says Jane.

Inspired by their success, the group will keep going, meeting once a week to ensure farmers continue to get the support they need.

Teaming up

If you're leading a team, remember – a 'good boss' ensures everyone:

- has individual and shared goals
- communicates clearly
- looks after each other.

Find out more about starting on the right foot at dairynz.co.nz/goodboss

INSPIRED BY DAIRY SCIENCE



Find out how DairyNZ-led research, scholarship and summer internship opportunities are helping farmers, while also inspiring two students' passion for a dairying career.

JESSICA DALTON

Massey University Masters student Jessica has been a DairyNZ scholar for two years. Last summer, she worked as an intern on a transition cow health study into supplementing synthetic zeolite, pre-calving.

"Cows go through a lot of change around calving, and they're susceptible to metabolic and infectious diseases," says Jessica. "Zeolite reduces the risk of milk fever, and we wanted to know how it affects cows' feeding behaviours."

"We found that zeolite-supplemented cows spent less time feeding pre-calving, but had a rebound in their feeding time after calving, when supplementation stopped. They also differed in their patterns of feeding during the day, which may contribute to how zeolite works to reduce milk fever."

Jessica says her internship has been "an awesome opportunity" to connect with scientists in the sector, see what careers are out there and gain experience. Next, she'll investigate the effects of different pre-calving management on lying and activity behaviours in relation to cow health, for her Masters.



"I hope the transition cow health project overall will help farmers to improve the health and productivity of their herds. Being part of the dairy sector also gives me a chance to give back to the community I grew up in."

SHOBANA REDDY

Shobana worked as a DairyNZ intern last summer, assisting with pre-trials for the Low-Nitrogen Livestock programme.

"Before that, I was a city girl who hadn't really even been around cows!" laughs Shobana, a Waikato Bachelor of Science undergraduate.

She says the programme's overall aim is to reduce nitrogen leaching.

"In the pre-trials, we mainly investigated cows' kidney function and glomerular filtration rate (GFR: how long it takes for nitrogen to be filtered through them), to see if a lower GFR would reduce the amount of nitrogen being leached in cows' urine."

"Our results were inconclusive, but we did discover that the multi-sample and single-sample methods weren't comparable, so it was good to have uncovered that before the proper trials get underway."

As well as blood and milk sampling, the next stage of the research will look at a broader range of variables, investigating stool samples and how often the cows urinate, says Shobana.

"Reducing nitrogen in cows' urine will help farmers to manage nitrogen reduction targets and benefit the environment as well."

"As for me, DairyNZ's support for my studies has provided me with access to so many smart people who've made me more passionate about my degree and working in this sector."



Find out more about DairyNZ scholarships, including summer internship opportunities, at dairynz.co.nz/scholarships and godairy.co.nz



Biosecurity in four easy steps

Keep the cows safe, healthy and productive using these four on-farm biosecurity practices, which also contribute to a sustainable and profitable farm system.

Whether it's Covid-19 affecting people, or bovine viral diarrhoea affecting cows, the importance of biosecurity in keeping humans and animals healthy and safe cannot be underestimated. Nor can we ignore the effect on New Zealand's economy and the profitability and sustainability of our sector if biosecurity measures are not carried out consistently and effectively.

Ensuring your farm's biosecurity is up to scratch doesn't need to be complicated. By regularly following the four easy steps below, you'll not only secure the future of your farm and its animals – you'll also help protect the future of dairying.



1. Adopt a 'clean on, clean off' policy

Get everyone, staff and visitors, to clean their hands, and clean and disinfect their boots/footwear on arrival and departure.

This minimises the risk of bringing unwanted pests, weeds and diseases onto the farm or spreading them from one farm to another.

This is the equivalent of washing your hands to minimise the spread of Covid-19.



2. Know the health status of incoming animals

Check the animal health status of animals prior to purchasing or leasing. This can be done using the DairyNZ pre-purchase checklist, available at dairynz.co.nz/pre-purchase

Keeping all new arrivals separate from the herd for at least a week will also reduce the risk of disease spread and also allows for testing and treatments.

This is the same principle as all new arrivals into New Zealand having to be tested for Covid-19 and quarantined before being able to travel around the country.

Ask your vet for advice on the specific risks to your farm.



3. Update your NAIT

Make sure all cattle are identified with an approved NAIT tag, and registered, and that all animal movements are recorded within 48 hours.

This means contact tracing can be carried out much more quickly and efficiently if needed, which minimises the spread of disease.

Contact OSPRI (**0800 482 463**) if you need help with your NAIT account.



Does your biosecurity routine scrub up?



4. Keep boundaries secure

Maintaining complete and secure boundary fences reduces the risk of unwanted animals contacting your herd, and maintains the animal health 'bubble' of the farm.

Check fences regularly and carry out any maintenance promptly.

Where possible, keep all roadside gates locked, apart from the main entrance to the farm.



Find out more about on-farm biosecurity at dairynz.co.nz/biosecurity

Keeping endometritis in check

DairyNZ's Samantha Tennent looks at how to reduce the impact of endometritis on your herd's reproductive performance.



'Dirty cows' (those with endometritis) have lower conception rates and lower in-calf rates. If they do get pregnant, that can take two to three weeks longer than cows without endometritis, which also affects their production and reproduction next season.

Endometritis is an infection or inflammation of the uterus that persists beyond the third week of calving. Recent research estimates at least 20 percent of cows have endometritis about four weeks before mating starts, but there is a large and unexplained variation in the prevalence of endometritis among herds.

Finding 'dirty cows'

Endometritis is usually diagnosed by evaluating the presence of pus in the vagina (assumed to be from the uterus) with the aid of a speculum, the Metricheck tool, or a gloved hand.

The most at-risk cows are generally those that had an assisted calving, retained foetal membranes, twins, a stillborn calf, vaginal discharge after calving, or an abortion.

And evidence suggests endometritis is more likely to occur in cows with a body condition score (BCS) of 4 or less at calving, cows with ketosis, or older cows.

While some farms will draft their at-risk cows to be checked, the causes of endometritis are largely unknown and many cows with endometritis have no history of problems around calving. Therefore, whole-herd metrichecking is recommended.

Herd metrichecking is commonly performed in two ways. The first is to complete a whole-herd metricheck once, around a month before mating starts. The second is to begin around three

weeks after the first cow calves, and repeat metrichecking about every three weeks, so part of the herd is checked roughly three times (referred to as batch metrichecking). By metrichecking the whole herd before mating as well, you'll pick up any cows that may have been missed or haven't responded to early treatments.

Treating and preventing

During metrichecking, positive cows can be drafted and treated by your veterinarian. Treating infected cows, usually with intra-uterine antibiotics, will improve fertility but the treatment takes time to work. Uterine infections should be treated at least four weeks before mating starts. This gives affected cows the best chance of getting in calf early in the mating period.

The best way to prevent endometritis is through effective management of the transition period, by optimising BCS, and minimising the number of cows with diseases around calving.

Key points

- Endometritis is a uterine disease that affects at least one in four cows, but the percentage of affected cows varies widely between herds.
- It reduces reproductive performance, and a farm's overall efficiency and profitability.
- DairyNZ recommends metrichecking your whole herd and treating infected cows early.



Farmers with vision

DairyNZ works in a number of ways to improve the public's perception of dairy farming. In our latest phase of The Vision is Clear movement, we're sharing stories about visionary Kiwis on a mission to improve our waterways.

The first of these was launched to the public in July. It features Jo Wood (aka Gumboot Girl), a strong promoter of waterway, wetland and environmental development on Waitapu Farms in Wellsford, north of Auckland. Check out the video at dairynz.co.nz/gumboots

Our #visionarykiwis stories will feature passionate advocates of The Vision is Clear movement.

We'd love to hear your waterways story – contact us at the thevisionisclear@dairynz.co.nz



Jo Woods, aka Gumboot Girl.

Waterway kit comes on stream

DairyNZ's latest education resource dives into a topic that's important to every New Zealander – waterway health.

Our new science kit will help teachers and students understand the complexities of water quality and the work farmers put into looking after the environment.

Five hundred teachers signed up to receive the water quality testing kit, which includes everything a class needs to investigate the different indicators of waterway health. Students will be able to study water flow, depth and clarity, invertebrate presence, streambed composition and periphyton (freshwater organisms).

Designed for Years 4 to 8 (ages 9 to 12), teachers in both urban and rural schools will be using the learning resource in Term 3.

See the new resource at dairynzschoools.co.nz



School students all over New Zealand will be heading out to investigate water quality in Term 3.

Farmer leaders sought for DairyNZ Board

Are you interested in stepping into a leadership role in the dairy sector? DairyNZ is encouraging farmers to apply to join our Board.

Nominations are open from August 10 until noon, Thursday, September 3, for two farmer-elected director positions on DairyNZ's Board of Directors.

Ideally, candidates will have:

- an understanding of farm systems, research and development, policy and advocacy
- involvement in setting strategy
- governance experience, and financial expertise
- an interest in progressing the *Dairy Tomorrow* strategy
- good networks and contacts in the sector
- strong commercial and strategic thinking skills.

Any farmer who pays the milksolids levy may stand for the Board of Directors. For information on nominations, visit dairynz.co.nz/agm

Election 2020 –
have your say!

vote 

The General Election is scheduled for Saturday, September 19, and DairyNZ is encouraging dairy farmers to vote.

Our team will be advocating on your behalf throughout the campaign to make sure politicians understand the dairy sector's perspective and that they're talking about the issues that matter to you, your business, and your community.

Check out dairynz.co.nz/2020election for updates.



Farmers to benefit from RP events

DairyNZ's events for rural professionals in the Lower North Island will ultimately help farmers get even better support.

Before the Covid-19 lockdown, DairyNZ's rural professional (RP) events were attended by more than 100 people, including service providers, sales representatives, farm consultants, regional council staff, bankers, and staff from the Ministry for Primary Industries.

A variety of topics were discussed, including the dairy sector strategy Dairy Tomorrow, the Fertility Breeding Value Trial, and an update on the region's Tararua Plantain Project, to name a few.

Since lockdown, our online gatherings have still been attracting large numbers. Requests have been made for future topics and speakers, so the events are set to continue to ensure farmers' trusted advisers have the information they need to support their clients. Future events will be in person.

Getting the message right

Engaging with RPs at these events is critically important in helping them communicate DairyNZ's knowledge, research and support to farmers, through consistent and accurate messaging. They can then work more effectively with their clients to make informed decisions about a farm's business, operation and sustainability.

Feedback has been highly positive, with attendees commenting on the value they gained through being brought up to speed on regional projects. They also commented on how the events have given them a chance to network with other RPs, allowing them to broaden their connections to better assist farmers.

The next event will be on August 27, 2020, at Manawatu Golf Club, Palmerston North. Go to dairynz.co.nz/events for details.

Tararua Plantain Project



DairyNZ research has found New Zealand-bred plantain can reduce the concentration of nitrogen (N) in cows' urine patches. This allows plants to utilise a greater proportion of N, which reduces N leaching by an estimated five to 30 percent.

The DairyNZ Tararua Plantain Project started more than a year ago, with a working group of eight Tararua farmers planting plantain and sharing their information and experiences.

The project has gained momentum, with around 50 of the 118 farmers in the Tararua District giving plantain a go.

Our aim is to get all 118 farmers on board – or to at least arm them with detail to make an informed decision for their farm.

While it's too early to measure water quality results, DairyNZ does have enough data from research to create forecasts on expected improvements. The numbers are looking promising.

Find out more about the project at dairynz.co.nz/tararua-plantain-project

August events

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
31					1	2
3	4	05 NORTHLAND The Ararua Discussion Group meets at the Ararua Community Hall between noon and 2 p.m. to discuss how everyone's getting on over calving. Contact Hamish Matthews, 021 242 5719.				9
10	11 TARANAKI Enjoy a mid-calving lunch between 11.30 a.m. and 12.30 p.m. by joining the Mangorei Discussion Group at Ate Forty One café in New Plymouth. For details, contact Ian Burmeister, 027 593 4122.				15	16
17	18 WAIKATO See Neil and Christine Goodin's new stand-off pad at the Te Kauwhata Waerenga Discussion Group's Calving Catch Up – lunch provided. Contact Mike Bramley, 027 486 4344.				22	23
24	25	26	27 LOWER NORTH ISLAND Lower NI Rural Professionals meet at the Manawatu Golf Club from 2 p.m. for a regional round up, sector updates and a greenhouse gas session. Register by Aug 20 via Kate Stewart, 027 702 3760.			

TO SEE WHAT ELSE IS HAPPENING IN YOUR REGION DURING AUGUST AND SEPTEMBER, GO TO [DAIRYNZ.CO.NZ/EVENTS](https://dairynz.co.nz/events)

DairyNZ consulting officers

Upper North Island – Head: Sharon Morrell 027 492 2907

Northland

Regional Leader	Tareen Ellis	027 499 9021
Far North	Amy Weston	027 807 9686
Lower Northland	Hamish Matthews	021 242 5719
Whangarei West	Ryan Baxter	021 809 569

Waikato

Regional Leader	Wilma Foster	021 246 2147
South Auckland	Mike Bramley	027 486 4344
Hauraki Plains/Coromandel	Michael Booth	021 245 8055
Te Aroha/Waihi	Euan Lock	027 293 4401
Cambridge	Lizzy Moore	021 242 2127
Hamilton	Ashley Smith	027 807 3049
Huntly/Tatuanui	Brigitte Ravera	027 288 1244
Matamata/Kereone	Frank Portegys	027 807 9685
Pirongia	Steve Canton	027 475 0918
Otorohanga/King Country	Denise Knop	027 513 7201
Waipa South	Kirsty Dickens	027 483 2205

Bay of Plenty

Regional Leader	Andrew Reid	027 292 3682
Central Plateau	Colin Grainger-Allen	021 225 8345
South Waikato/Rotorua South	Angela Clarke	027 276 2675
Eastern Bay of Plenty	Andrew Reid	027 292 3682
Central Bay of Plenty	Kevin McKinley	027 288 8238

Lower North Island – Head: Rob Brazendale 021 683 139

Taranaki

Regional Leader	Mark Laurence	027 704 5562
South Taranaki	Mark Laurence	027 704 5562
Central Taranaki	Emma Hawley	021 276 5832
Coastal Taranaki	Caroline Benson	027 210 2137
North Taranaki	Ian Burmeister	027 593 4122

Lower North Island

Horowhenua/Coastal and Southern Manawatu	Kate Stewart	027 702 3760
Wairarapa/Tararua	Rob Brazendale	021 683 139
Eketahuna	Andrew Hull	027 298 7260
Hawke's Bay	Gray Beagley	021 286 4346
Northern Manawatu/Wanganui/Woodville	Rob Brazendale	021 683 139
Central Manawatu/Rangitikei	Charlotte Grayling	027 355 3764

South Island – Head: Tony Finch 027 706 6183

Top of South Island/West Coast

Nelson/Marlborough	Mark Shadwick	021 287 7057
West Coast	Angela Leslie	021 277 2894

Canterbury/North Otago

Regional Leader	Rachael Russell	027 261 3250
North Canterbury	Amy Chamberlain	027 243 0943
Central Canterbury	Alice Reilly	027 3798 069
Mid Canterbury	Stuart Moorhouse	027 513 7200
South Canterbury	Heather Donaldson	027 593 4124
North Otago	Alana Hall	027 290 5988

Southland/South Otago

Regional Leader	Ollie Knowles	027 226 4420
West Otago/Gore	Keely Sullivan	027 524 5890
South Otago	Guy Michaels	021 302 034
Northern/Central Southland	Nicole E Hammond	021 240 8529
Eastern Southland	Nathan Nelson	021 225 6931
Western Southland	Leo Pekar	027 211 1389

DairyNZ directors

Jim van der Poel	021 848484
Elaine Cook	027 223 2049
Colin Glass	027 486 4064
Jacqueline Rowarth	027 694 4334
Peter Schuyt	027 557 4242
Jo Coughlan	021 522 142
Tracy Brown	027 291 1716

Monitoring lying behaviour to improve cow health

Wearable technologies can provide detailed information about individual cow behaviour, but what can they tell us about animal health and welfare?



Stacey Hendriks, Post-doctoral Scientist, Massey University

Claire Phyn, Senior Scientist, DairyNZ

Danny Donaghy, Professor of Dairy Systems, Massey University

John Roche, Professor, University of Auckland

Producers and consumers of milk products have a shared interest in achieving a high standard of cow health and wellbeing. Behavioural changes are commonly associated with events such as imminent calving and compromised health but, in practice, can be difficult to detect.

Increasingly, wearable technologies provide an opportunity to evaluate behaviour automatically, and to detect subtle changes or early signs of illness. These technologies are particularly relevant for large herds where time to observe individual animals is limited, and in situations where farm staff are inexperienced in animal husbandry.

Many technologies, including neck-worn collars and ear tags, can provide information about an animal's activity. However, only leg monitors can measure both lying behaviours and activity. These behaviours include the amount of time a cow spends lying, and the number of times it transitions between lying and standing positions.

Lying time as a measurement of welfare

Lying down is an important resting activity for dairy cows, but daily lying times vary widely across herds and farm systems^{1, 2, 3}. Furthermore, average daily lying times vary more between individual cows within the same herd (5.8 to 12.6 hours/day) than between different herds or farms (7.9 to 9.7 hours/day)¹. Many factors influence lying time naturally, including cow age, breed, management, weather, and stage of lactation. These are important



A behaviour monitor attached to the back leg of a dairy cow.

Key points

1. Lying time is increasingly regarded as an indicator of cow comfort, health, and welfare; however, little is known about appropriate lying times for grazing cows.
2. Furthermore, differences between individual cows, herds, and farm systems do not always indicate compromised welfare.
3. Monitoring lying and activity behaviours could identify sick cows before they start showing symptoms, and predict when a cow is about to calve.

considerations, as shorter lying times are not necessarily detrimental to the cow. Therefore, to provide a robust indicator of herd welfare status, any benchmarks for lying and activity behaviours need to account for factors such as farm system and stage of lactation.

How long does a grazing cow spend lying?

New Zealand's pasture-based dairy cows need to spend a lot of time on their feet to graze. DairyNZ-funded research* indicates that grazing cows spend 13 to 28 percent less time lying each day than housed cows^{1,2}.

Milking cows need to walk to the farm dairy and spend more time grazing, leaving less time to lie down compared with dry cows (8.6 vs. 10.3 hours/day)¹. By comparison, dry grazing cows spend more time lying down at night and like to feed during the day¹ (Figure 1). After calving, a cow's lying time decreases at night and increases during the middle of the day¹ as they adjust to account for twice-daily milking and post-milking feeding bouts (Figure 1). Changes to the typical pattern of lying and activity behaviours within a day may provide useful insights into cow health and welfare.

Managing each cow as an individual

The major advantage of monitoring behaviour is to predict when an individual cow is unwell or might need help. Individual cows are reasonably consistent in their lying times across days², meaning each cow can be used as her own reference point. Changes in behaviour could predict when she is sick or about to calve, especially if these changes are not mirrored by herd mates.

Figure 1. Percentage of the herd lying within each hour of the day

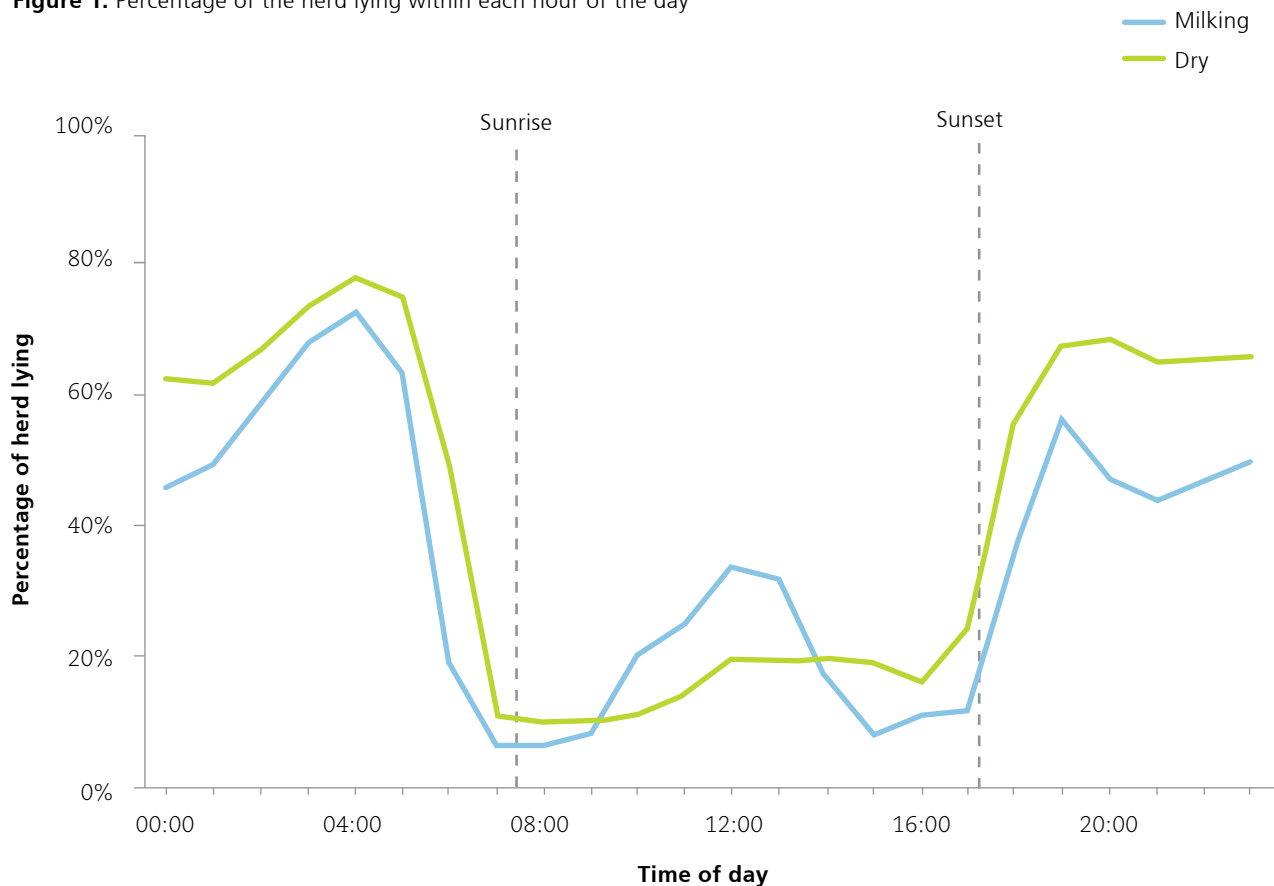
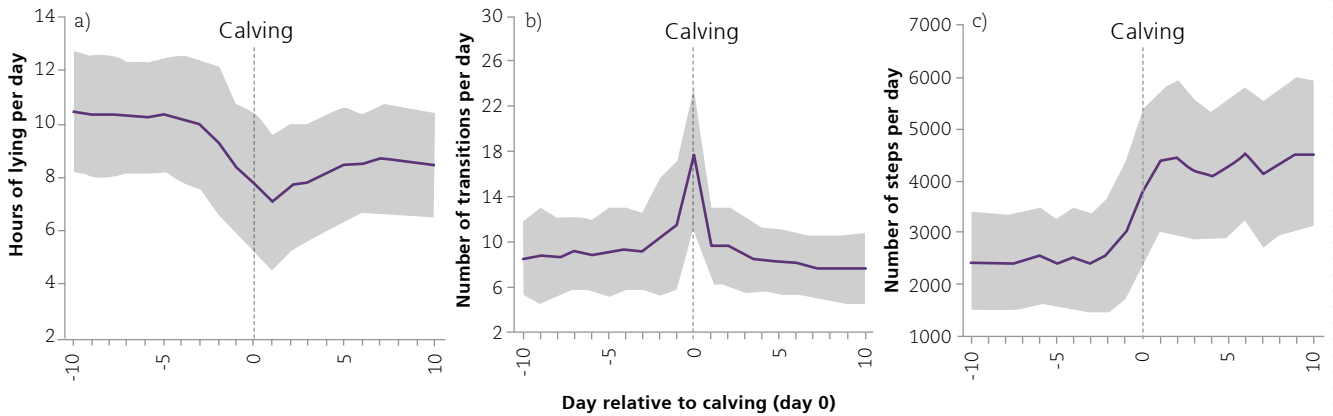


Figure 2. The average daily lying time (a), the daily number of transitions between lying and standing (b), and the daily number of steps taken (c) across the transition period



Shaded area represents the standard deviation (adapted from Hendriks et al. 2019¹).

Predicting calving

As calving approaches, dairy cows change their behaviour due to 'nesting', restlessness, and discomfort. These signals could be detected using wearable devices, allowing farmers to closely monitor cows about to calve, and indicating which cows are at-risk and need additional assistance. Recent DairyNZ-funded research* determined that leg-attached devices detected dramatic changes in lying behaviour and activity in grazing cows (Figure 2) from two days before calving when:

- cows spent less time lying
- steps taken increased, and
- there were large increases in the number of transitions from lying to standing¹.

Overseas research indicates that two or more different technologies are required to obtain the most accurate calving predictions. Borchers et al.⁴ reported that using a leg-attached device to measure activity and lying behaviour, in combination with an additional device to measure rumination time, could predict calving within eight hours. Further research is required to develop practical tools that farmers can use for this purpose.



Milking cows fitted with behaviour monitors.

Identifying sick cows

Behaviour-monitoring technologies may allow early identification of disease for improved treatment and management of at-risk and sick animals. Interventions are typically more successful if they start earlier in the disease process, e.g. before clinical signs. Hence, behaviour technologies could be used to detect both subclinical and clinical diseases, including during the transition period, when about 75 percent of metabolic and 90 percent of infectious diseases occur.

Although many studies have investigated the behaviour of housed cows experiencing various metabolic diseases, research in grazing dairy cows is limited. DairyNZ-funded research* was the first to characterise the lying behaviour and activity of grazing dairy cows experiencing subclinical forms of the common metabolic disorders, milk fever and ketosis.

Subclinical milk fever

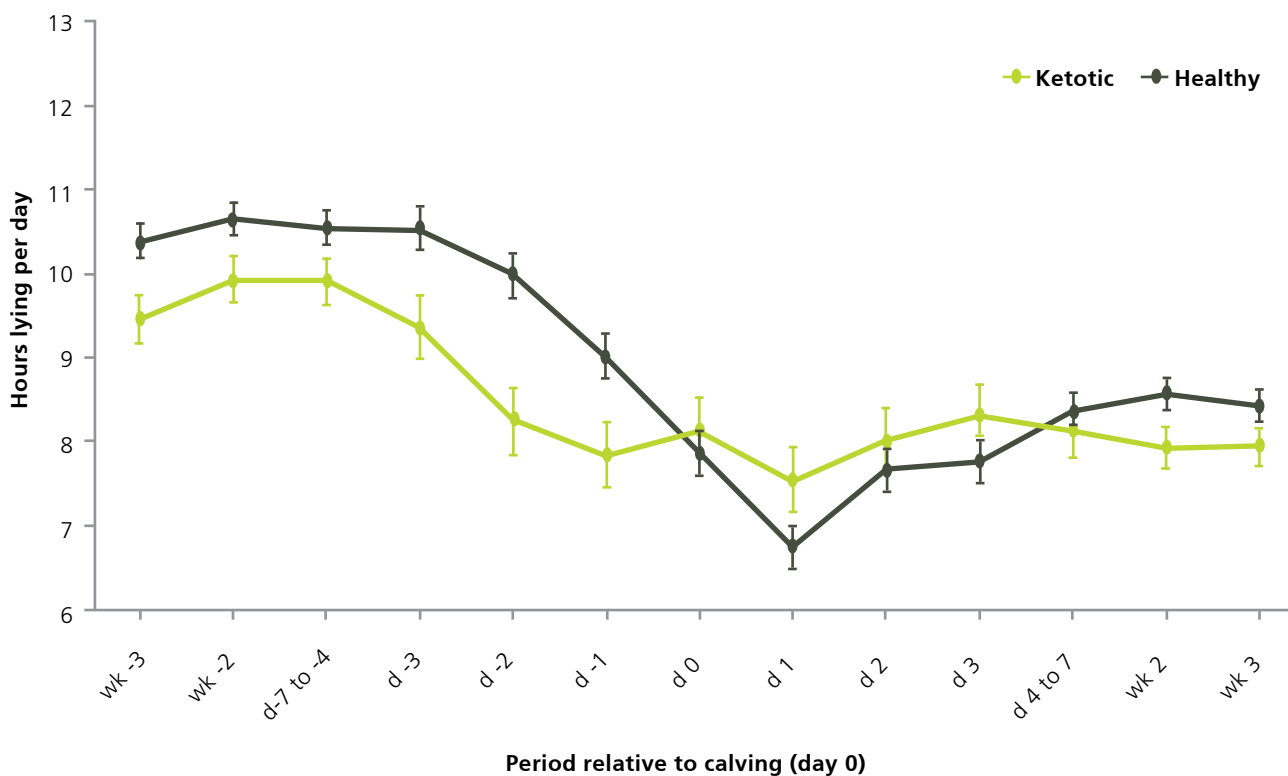
A downer cow with milk fever puts stress on both itself and the farmer during the busy calving period. However, the

prevalence of subclinical milk fever (i.e., not a downer cow, but a cow with low blood calcium levels) is much greater, averaging about 30 to 50 percent of the herd, and is linked with reduced cow performance and increased risk of health complications^{5, 6}.

Using changes in lying and activity behaviours to identify subclinical milk fever early may improve detection of cows at-risk of 'going down' or better predict those that succumb to other complications. For example, if changes in behaviour can identify cows at-risk of subclinical milk fever, then a farmer could prioritise these animals for 'starter drench' immediately post-calving.

DairyNZ-funded research* identified that cows with very low blood calcium (less than 1.4 mmol/L) within 48 hours of calving spent longer lying on the day before (+1.4 hours) and on the day of calving (+2.6 hours) than cows with normal blood calcium levels (greater than 2.0 mmol/L). These cows were also less active and had more transitions between lying and standing positions on the day of calving. Although further research is required to develop accurate predictive models, analysis to date indicates that changes in lying behaviours and daily steps taken could be

Figure 3. Daily lying time in healthy and subclinically ketotic cows during the transition period



used to predict an individual cow's calcium status at calving.

This suggests cows experiencing milk fever could be automatically detected using wearable devices that signal these altered behaviours to the herd manager.

Subclinical ketosis

All cows experience some degree of negative energy balance after calving, due to the mobilisation of body fat to support milk production. However, if a cow is unable to successfully adapt to this process, it can develop ketosis, which is characterised by high blood ketone concentrations. Clinical ketosis is relatively uncommon, but subclinical ketosis can affect 68 to 75 percent of cows during the first five weeks post-calving⁷. Subclinical ketosis can negatively affect cow performance, reproduction and health⁷.

Recent research* has indicated that cows with subclinical ketosis during the first two weeks in milk had previously spent less time lying, walked more, and transitioned less frequently between lying and standing, up to three weeks before calving (Figure 3). In

the future, monitoring lying behaviour and activity before calving may help predict cows at risk of ketosis and enable farmers to prioritise targeted management and interventions.

Future research

DairyNZ-funded research* has determined that cows with metabolic disease have different behaviour patterns to healthy cows. So, monitoring changes in lying and activity could be useful for predicting sickness. More research is required to develop predictive tools and to investigate treating cows that show differences in behaviour to see if it reduces the incidence of disease and improves performance. This work would provide farmers with the value proposition for adopting behaviour-monitoring technologies.

**The Pillars of a New Dairy System programme is levy-funded, with matched co-funding from the Ministry of Business Innovation and Employment (MBIE). Additional co-funding is provided by AgResearch, and in-kind support is received from LIC, CRV Ambreed and Fonterra. See dairynz.co.nz/pillars*

S. Hendriks gratefully acknowledges additional support from the Ministry for Primary Industries Postgraduate Science Scholarship and the Colin Holmes Dairy Scholarship.

References:

1. Hendriks, S. J., C. V. C. Phyn, S.-A. Turner, K. M. Mueller, B. Kuhn-Sherlock, D. J. Donaghy, J. M. Huzzey, and J. R. Roche. 2019. Lying behavior and activity during the transition period of clinically healthy grazing dairy cows. *Journal of Dairy Science* 102:7371-7384.
2. Huzzey, J. M., M. A. G. Von Keyserlingk, and D. M. Weary. 2005. Changes in feeding, drinking, and standing behavior of dairy cows during the transition period. *Journal of Dairy Science* 88:2454-2461.
3. Ito, K., D. M. Weary, and M. A. G. von Keyserlingk. 2009. Lying behavior: Assessing within- and between-herd variation in free-stall-housed dairy cows. *Journal of Dairy Science* 92:4412-4420.
4. Borchers, M. R., Y. M. Chang, K. L. Proudfoot, B. A. Wadsworth, A. E. Stone, and J. M. Bewley. 2017. Machine-learning-based calving prediction from activity, lying, and ruminating behaviors in dairy cattle. *Journal of Dairy Science* 100:5664-5674.
5. Roche, J. R. 2003. The incidence and control of hypocalcaemia in pasture-based systems. *Acta Veterinaria Scandinavica Supplementum* 97:141-144.
6. Roberts, K. I., and S. McDougall. 2019. Risk factors for subclinical hypocalcaemia, and associations between subclinical hypocalcaemia and reproductive performance, in pasture-based dairy herds in New Zealand. *New Zealand Veterinary Journal* 67:12-19.
7. Phyn, C. V. C., B. Kuhn-Sherlock, S.-A. Turner, T. M. Grala, C. R. Burke, and J. R. Roche. 2017. Contract session: An overview of postpartum hyperketonaemia and its association with cow health and performance in pasture-based dairy systems. *New Zealand Society of Animal Production* 77:104-106.

WE'VE LAUNCHED A CAMPAIGN
TO SUPPORT KIWIS INTO DAIRY
FARMING JOBS.

DISCOVER
YOUR FUTURE IN DAIRY



**EMPLOY A CAREER-
CHANGER NOW**

Many hard-working Kiwis have found themselves out of work due to Covid-19.

Now is a great time to consider employing a career-changer. Look out for people with farm-ready training.

New Zealand Permit No. 174646	Permit 
----------------------------------	---

Sender: DairyNZ, Private Bag 3221, Hamilton 3240, NZ

dairynz.co.nz/godairy 

GODAIRY DairyNZ 