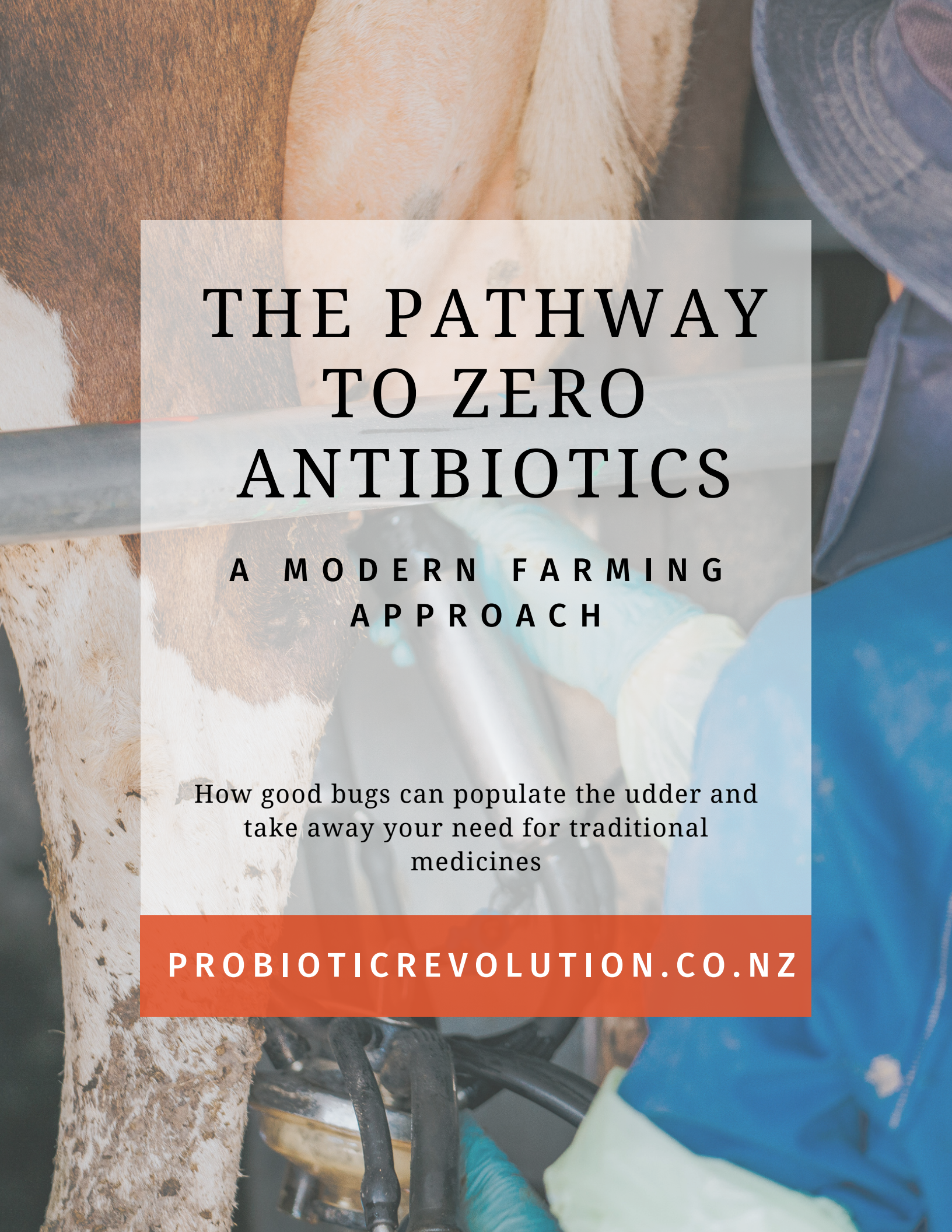

THE PATHWAY TO ZERO ANTIBIOTICS

A MODERN FARMING APPROACH

How good bugs can populate the udder and take away your need for traditional medicines

PROBIOTICREVOLUTION.CO.NZ

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INTRODUCTION

Probiotic Revolution’s combination of probiotics and digestive enzymes have been formulated at unprecedented levels - giving its clients unmatched results. Backed by solid international science, the world now understands the role of micro-organisms in immune function and general health. But the newest movement is in what these good bugs can do in a cow's udder.

The 'main player' of our five strains of bacteria in controlling mastitis is Bacillus subtilis. The University of Otago published a study in 2006, which found that there was a naturally higher level of Bacillus subtilis in the udders of cows with low Somatic Cell Counts (SCC). Cows with either high SCC or clinical mastitis had little or no Bacillus subtilis.

This study also concluded that they could populate the udder with Bacillus subtilis through oral administration.

By using oral doses at dry-off and to springers pre-calving (in combination), we are seeing an increasing number of farmers using zero antibiotics for mastitis management.

The path to ZERO antibiotics

1

Use SuperStart Lead Feed for springers

- Water trough or mixer wagon.

A powerful probiotic overcoming ketosis related issues for easier calving and reducing calving mastitis.

"We used to get up to 30% heifer mastitis. Now we are unlucky if we get 2-4%" Stewart, Pahiatua

2

Use BioRumen DFM to milkers

- In shed, mixer wagon or other applications

Improved feed conversion, noticeably better fibre digestion and reduced acidosis. Improves a cow's base immunity, so that results for cows treated for mastistis with Immunomax or Bovine Boost are improved.

3

Treat clinical mastitis cases with ImmunoMax - 5 days

- Drench or trough
- just $17-20/cow with NIL milk withhold

"***Last season I treated 25 cows. One had to be treated twice so we culled her"*** John, Kaponga

4

Treat cows with Bovine boost at drying-off

- Drench or trough treatment

Helps populate the udder with mastitis inhibiting bacteria.

"***I've treated high SCC cows for 2 years and to me it is just as effective as dry cow therapy. Very few treated cows have to be culled during the season***"
Shaun, Inglewood

5

Continue to use other mastitis management practises to stop mastitis and to boost herd immunity. Supplement with minerals, including minerals which are vital for immune function - Selenium and Zinc. Make sure milking machines are running efficiently. Teat-spray milkers. Cull clinical cases, which don't respond to treatment.

BOVINE IMMUNOMAX

BOVINE BOOST

PROBIOTIC REVOLUTION

SHAUN - DRENCH

Written by Dianna Malcolm for Rural News

Taranaki sharemilker Shaun Eichstaedt was the first New Zealander to replace traditional antibiotic Dry Cow Therapy (DCT) with a high-strength probiotic.

Shaun milks 230 cows on 89 effective hectares in a 50/50 sharemilking contract. All the young stock graze off the property after weaning from December 1. They return as rising R2s on May 31 two years later.

Shaun has a number of older cows in the herd, and he appreciates that age and multiple lactations makes those herd matriarchs more vulnerable to mastitis, and high SCCs. It makes his dry-off strategy a critical part of his management decisions.

“A couple of years ago, we started looking for a fresh approach to drying off,” Shaun said. “We had been noticing that quite a few of the older cows in our herd – aged between nine and 12 years old – had higher SCCs, even though they had been treated with antibiotic DCT most of their life.

“And, some of those cows were still coming in with mastitis at the start of the next season. We realised that the antibiotic DCT wasn’t doing it for them, so we decided to try something different.”

Probiotic drench lowers SCC

In 2019, he drenched 31 cows, who had a SCC of 150,000 or higher for five days before dry-off with probiotic ImmunoMax. It includes a powerful blend of five strains of beneficial bacteria, five digestive enzymes, and a specialised strain of live active yeast. At 190 billion colony forming units (CFU) per dose, its unprecedented strength is causing a widening ripple-effect in DCT conversations throughout New Zealand.

That year the average SCC in that sub-group just before dry-off in the autumn was 556,000. On the first herd test the following spring, it dropped by 46%. In 2020, the autumn average SCC on Shaun’s high SCC cows, before they were treated at drying off with probiotics was 678,000. That number dropped by 40% on the first spring herd test.

SHAUN - DRENCH

Strengthened immune function

While the response wasn't immediately as high as it had been with DCT (67%), there were longer-term advantages which Shaun believes has been potentially game-changing to his herd's udder health, and natural immune function."We only had a couple of cows that ended up with a bit of winter mastitis, and they hadn't been treated with ImmunoMax," Shaun said.

"I also found drenching the cows easier than using DCT, because I didn't have those two hours of extra work involved with the antibiotic DCT on the day of dry-off."

He says while his herd's 160,000 average SCC this season remains slightly high for his liking, he is managing a number of older cows.

"I did put one cow, who didn't have clinical mastitis on the bucket for a couple of milkings – because I suspected her SCC might be high – just to see how she was impacting on the herd's SCC. It dropped it by 35,000, so I know I need to address those few cows that are 10 or 11-year-old," Shaun said.

SHAUN - DRENCH

Clinical mastitis cleared without antibiotics

What he has also noticed is that fewer cows treated with ImmunoMax have gone on to break down with clinical mastitis the next season. Of the ones that have, he has found an effective alternative treatment, which has also had a positive impact on some of his culling decisions. He used some leftover ImmunoMax to drench the clinical mastitis cows for five days, rather than reaching for an antibiotic intermammary treatment. “That’s all those cows were treated with,” Shaun said. “And, they all cleared up.”

It also meant there was no milk or meat withholding.

Shaun is now considering his options to feed a high-strength probiotic lead feed to his springers, and an in-feed Direct Fed Microbial to complete the probiotic picture for his herd.

He said the lower workload, results, and nil milk and/or meat withhold at calving have won him over.

“The cost was pretty similar, but (for me) the probiotics involved significantly less effort, which was a bonus. I’m happy. I feel that ImmunoMax has done the same job as DCT, and I’d rather not use the antibiotics.”

UNIVERSITY OF OTAGO TRIAL

The obvious inadequacies of current methods of mastitis management (Bradley 2002) have created an urgent need for more effective preventatives and treatments (Gruet et al. 2001; Pyorala 2002).

Nonpathogenic inhibitory bacteria known as probiotics are currently used to treat or prevent a variety of infectious diseases of humans (Tagg and Dierksen 2003) and some have also been proposed for use as potential mastitis control agents (Pankey et al. 1985; Woodward et al. 1987, 1988; Greene et al. 1991).

Bacteriocins, including some that are known to be produced by probiotic bacteria, have also been recommended for the control of mastitis (Ryan et al. 1998; Ross et al. 1999; Ryan et al. 1999).

Bacteriocins are antimicrobial peptides having a relatively narrow killing spectrum but usually having most of their activity directed against other bacteria closely related to the producing strain (Riley and Wertz 2002a).

Clearly this animal, which maintained low SCC readings throughout the study, persistently harboured a heterogeneous population of inhibitory bacilli within its udder microflora.

Conclusions: Bacilli present in the udder microbiota of healthy cows can produce a variety of broadly active inhibitors of Gram-positive bacteria, including potential mastitis pathogens.

Significance and Impact of the Study: Inhibitor-producing strains of commensal Bacillus species have been identified, which may have the potential for use as possible antimastitis probiotics.

Commensal bacilli inhibitory to mastitis pathogens isolated from the udder microbiota of healthy cows
M. Al-Qumber and J.R. Tagg
Department of Microbiology and Immunology, University of Otago, Dunedin, New Zealand

JOHN - TROUGH

Written by Dianna Malcolm for Dairy News

Necessity is the mother of invention

John and Donna McCarty no longer use intermammary antibiotics for mastitis or dry cow treatment, which has saved them money and improved herd health.

The couple farm 142 hectares (350 acres) at Riverlea near Kaponga, in South Taranaki (near Mt Egmont) milking 320-head through a 44-bale rotary. They are progressing towards a F8/J8 herd with a production average of 500-550kg Milk Solids (MS) per cow. Their production is sitting at 1250Kg MS per ha, and they recently recorded their highest production on-farm at 159,970Kg MS. Their average BMCC [Bulk Milk Cell Count] runs at 120,000.

Their local vet practice acknowledges all of its clients' level of antibiotic use on-farm with a ranking between one and 10 – with 10 being the highest. The area average is seven. McCarty's is 1.5 – one of the lowest within this practice.

Drama to relief

Their secret?
In part, a chance conversation during a maize overload crisis. John said they were smashed by Cyclone Gita four years ago, and his maize crop, which was poised to yield 23T/ha was torn down to 15T/ha. He decided the fallen crop left in the paddock was too valuable to waste, so after discussing it with his vets, he made the call to carefully feed the paddock off in small breaks. Although it had never been done, and the vets warned against it, it was working…until the cows broke out.

"I'd got through 30 days, and they were cleaning up the cobs like they were turnips," John said. "They were loving them. And, then the morning after they broke out I got the call, 'There's four cows down in the paddock, two down in the shed, and one on the race.' I got to the shed and by that time there were cows down all over the place with acidosis. We got two vets out, and started treating them as fast as we could.

John estimates the cows lost an estimated 0.5 – 0.75 in body condition score and he was dreading what lay in front of them at calving because of the metabolic trauma and his herd's rapid weight-loss.

Probiotics Revolution solution
Enter, Probiotic Revolution's Chris Collier.

"Chris said his product would help. And, at that point, I thought: 'I'll give anything a shot'."

Chris recommended adding BioRumen DFM, a Direct Fed Microbial, which has been fortified with unprecedented amounts of probiotic bacteria, probiotics, enzymes and yeasts. Importantly, 70-80% of a mammal's immune function is driven by the bacteria in their body – most of which is in the lower gastrointestinal (GI) tract. So getting the right concentrations of microencapsulated probiotics to the sweet spot – to outcompete pathogenic bacteria – allows cows to fight infection on their own. The yeasts also stabilise the rumen at a healthy pH of 6-7.

John said he couldn't believe how well it worked.

"Honestly, by the time they had all calved you wouldn't have known how sick they had been," John said. "They all looked a picture. We had no acidosis, no retrained cleaning, our SCC was 110,000. And, that was the year we achieved a production record by 7000KgMS – even though the cows started from the worst position possible."

JOHN - TROUGH

Waste not, want not
John and Donna have a feed pad, because they believe that maize is an expensive feed to have trampled into a paddock. They don't feed meal in the bale. They add BioRumen DFM to their Maize silage, and the cows have access to it before the afternoon milking. John said he already used organic fertilisers, and the probiotic path had always interested him.

"I'm not organic and I probably never will be," John said. "But I've been interested in not using antibiotics to treat mastitis. I look at what city people are saying, and I don't think the overuse of antibiotics in cows is good in general.

"I wanted our antibiotic use to be as minimal as I could make it."

Changing their approach
They have now completed two seasons using no antibiotics for mastitis.

This season the 25 clinical cases of mastitis in total have been instead treated with a potent oral probiotic drench for four to seven days. It cost $11.50/treatment, with nil milk withhold.

Twenty-four have recovered. One was culled.

"You know, I had some cows that I thought would never come right. One had a rock-hard quarter, and when I've treated those cows in the past with antibiotics I'd get maybe a 30 percent cure rate," John said.

"With the ImmunoMax drench [a treatment product which includes 190 billion Colony Forming Units/dose], five days after I started, the quarter was still rock hard, and I remembered that Chris [Collier] said it might take six or seven days. I drenched her again on the sixth morning, and I noticed the quarter was starting to soften.

"On the seventh morning I missed her completely because the swelling had gone, so I never even saw her come into the shed. I deliberately made sure I caught her on the next milking, and I stripped her, and she didn't have a trace of mastitis anywhere.

"That's what sold me on it."

JOHN - TROUGH

The proof
The rest of the herd were fed the herd's probiotic, BioRumen DFM – albeit in higher dose rates – during the last three weeks of their dry period.

"Of those 77 problem cows, four came in with clinical mastitis and the overall herd SCC is similar to last year at around 120,000," John said. "It could have been luck, but I'm happy to promote this as an alternative to antibiotics.

"And, as good as these results are for us, it's also been nice that we don't have to panic about withholding times, and getting caught out at the factory if a cow calves early.

"I'm going to use it again this season. If I get two or three years in a row with the same results, it will speak for itself."

As a comparison, In 2017 (before John and Donna had included probiotics for the herd) they had 34 cases of mastitis at calving (9.5%); in 2018 and 2019 (with BioRumen included) there were 17 cases (5%). This year it was 17 cases again, until they had to drop out the probiotics (see above).

Lightbulb moment
This season has given John some additional clarity.

"I usually let the dry cows clean up behind the milkers on the feed pad [which includes BioRumen DFM]. But, as I got towards the end of calving, I couldn't do that anymore, because I'd added Lime flour for the milkers, and it impacts on milk fever in the dry cows.

"So, my last calvers had two to three weeks without anything, and I felt the consequences. I had two or three come in with retained placentas, I had mastitis in about four of them, I had acidosis in a couple. And, I thought, 'I've calved 300 cows without a problem, and now on these last 40 I've got all this stuff going wrong'.

"And, I'm sure it's all because we stopped feeding the probiotics. As soon as they calved and they got back on the probiotics again, they cleaned up and came right. Their eyes looked good again, and they were milking strong.

"Things coming together
Next season they will include a contract milker in the operation, and they intend to step it up again by including Probiotic Revolution's dedicated lead feed, Super Start.

They also feed Calf Xtreme, a powerful daily probiotic powder in the calf milk. They are looking forward to having more time to study the impact of probiotics on the calves once they get more hands on deck – in between John's new venture – bee keeping.

"It's just that it's been hard until now in terms of the workload with just Donna and myself here.

"The timing is perfect for us."

NOCEK TRIAL

Ketosis and calving mastitis

There are a number of factors that determine whether cows get mastitis.

The general health and nutrition of cows are contributing factors. At calving (for example) a cow's immune system is naturally challenged, and it is known that metabolic diseases like milk fever and ketosis also contribute to mastitis.

It is common practise for dairy farmers to take measures to prevent and/or treat milk fever. However, often little is done to reduce ketosis because it is largely sub-clinical. The incidence of calving mastitis is directly correlated to sub-clinical ketosis. Maintaining a strong immune system is therefore important to reduce ketosis and hence mastitis around calving (Goff and Horst).

This is supported by high doses of probiotic bacteria. Ketosis is also a result of a cow's negative energy balance, and her inability to effectively mobilise fat reserves with the sudden onset of milk production at calving. Elevated blood levels of ketones depress blood glucose levels and this - in turn - depresses appetite and intake. Probiotic Revolution uses specific probiotic components to counter this by elevating blood glucose levels.

In the Nocek trial, the best milk response was obtained when probiotics were started 21 days pre-calving rather than just at calving.

This shows that the use of specific probiotics pre-calving are countering sub-clinical ketosis and achieving early milk production without compromising cow-health.

J. Dairy Sci. 86:331–335©
American Dairy Science Association, 2003.
Direct-Fed Microbial Supplementation on the Performance of Dairy Cattle During the Transition Period1J.
E. Nocek,* W. P. Kautz,† J. A. Z. Leedle,† and E. Block‡,2*
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Powerful probiotics a game changer

DIANNA MALCOLM

Cole Townsend with the next generation of his calves.

WAIKATO dairy farmer Cole Townsend is so confident in the high-strength probiotics he is using, he has stopped vaccinating his cows against rotavirus.

Townsend and wife Josephine sharemilk about 200 cows on 60 hectares at Wardville near Matamata.

Townsend is big on tracking numbers and has the perfect herd size to note how his decisions impact on his cow and calf health.

They are getting a return on investment of $2400 for every $800 spent on the operation (calculated on a $6/kilogram of milksolids). But more than that, he says he has never been in such a "sweet spot" when it comes to being on top of animal health in an impactful and natural way.

And while he is happy the numbers add up, he says there is a much bigger story in play here. He believes these probiotics have contributed to him recording his highest production through the drought, while making his day-to-day workload a revelation.

His decision to turn his back vaccinating for rotaviruses was one some wouldn't have made.

His rationale included that a mammal's lower gastrointestinal (GI) tract drives 70-80% of its immunity. So he knew if he was going to choose probiotics to bolster immunity, he needed them to be strong enough to reach the lower GI tract so his animals could fight infections on their own.

He first discovered Probiotic Revolution in 2018, while trawling for solutions online after a salmonella outbreak. He added the probiotic supplement Calf Xtreme to his calf milk during the crisis because the calves had struggled with the vaccination.

The results encouraged him to take the next step and replace his milking herd's in-feed antibiotic buffer with Bio Rumen DFM, a probiotic rumen stimulant, which supports and promotes immunity.

In 2019, he also included a new lead feed, Super Start, for his dry cows two weeks out from calving, to set them up for their next season. The daily supplement was fed in the water trough.

Townsend credits the three decisions with setting him up for the best results of his career.

The crossbred herd was averaging more than 26 litres per cow in September, with 2.5kg MS/day – with protein running higher than last season at 4.0%.

Of the 177 cows to calve this season, he assisted just three, and four weeks out from mating he was noting four to five cows in season every day.

Adding Calf Xtreme to the calves' daily milk was initiated because of the salmonella – but Townsend continued with it because he was so impressed.

"To give you some perspective, our cow's average weight in the herd is 475kg. We look to wean calves at an average of 110-115kg – generally aged around 12 weeks. This year at that age, some were pushing 135kg," he says.

Townsend says it was easy to note the change of health and energy in his calf shed.

"Generally, the calves now have a greater will to forage and they do it much younger," he says.

"Every year, we are pushing the boundaries a little bit more. We are now feeding up to seven litres once-a-day (OAD) from the time they are 10 days old. We are able to do that safely because of Calf Xtreme."

He says the decision to skip vaccinating the herd for rotaviruses before calving has been – so far – the right choice.

"The vets thought I was crazy. And to be fair, everyone's circumstances are different, I understand that. But I put my money into probiotics," he says.

"Instead of spending $2000 on a vaccine, I spent $1500 on probiotics and I got so much more value than just the savings on the product.

"I also got better, happier calves and faster weight-gain.

"It's everything really. I even feed Calf Xtreme to the bobby calves, because that way I just don't have sick calves."

The herd is fed nearly one tonne of meal/cow/year, which averages out at 3kg for 300 days of the year. The Townsends say using Bio Rumen DFM through the dairy adds up.

Animals on the Wardville farm, including this season's calves, have not been vaccinated for the rotavirus on account of probiotics.

"Being 50:50 sharemilkers, (when I could do it) really came down to the price," Townsend says.

"I probably introduced it at the wrong time of the year at the start of 2020 through the drought. The cows were still doing 2kg MS and they held that right through January, they started dropping in February because we were struggling a bit for feed, and I dropped them back to OAD milking at that point.

"I had been using the Bio Rumen DFM throughout, but I dropped it in March. They immediately dropped 0.2kg MS, their manure changed to a bad consistency and their temperament also wasn't as good in the shed. So, I decided to put it back in for the finish of the season.

"You could definitely tell the difference, even though we were still struggling a bit for feed at that time, it definitely helped with feed conversion.

"When they were on OAD without the Bio Rumen, they dropped and were as low as 1.1kg to 1.2kg. When we added it back in, combined with some green grass in late March, we were able to put them back to twice-a-day (TAD) milking and lifted production back to 1.5kg MS/day."

The Townsends finished last season with 87,000kg MS off 173 cows, just over 507kg MS/cow – their best season to date. They fed up to 4kg of meal/cow/day and supported the herd with 20 tonnes of maize silage when it was needed. They also have 15% of the farm planted in chicory.

"I've never achieved that production before and it was a tough year. I don't think the cows would have held at 2kg MS in January without Bio Rumen. They are usually doing 1.8-1.9kg MS at that stage," he says.

"They also held their condition. I got plenty of comments from the farm owner, neighbours and even my mates that the cows were in fantastic condition. That's why I didn't worry about putting them back to TAD.

"From what I heard in our area, I was doing 0.2kg-0.3kg more than everyone else on similar feeding systems."

With the cows responding to the Bio Rumen, Townsend decided to focus on his lead feed, Super Start.

He assisted three calvings out of 177 this season, with three calf deaths. He usually milks the colostrum cows OAD until they get into stride.

"This year, they bounced back so quickly from calving that I just put them straight to TAD," he says.

"They just seemed to hit the ground running. I found on day five or six after calving, they were almost ready to go to peak.

"I only had one case of mastitis this year and I'd usually get around eight by this stage. I had two or three cows that dried off with dry cow treatment because they had high somatic cell counts of four to six million with repeated clinical cases of mastitis.

"This season, those cows calved and the mastitis was completely gone. I haven't treated them. I honestly expected that I'd only be able to use their milk for the calves this year.

"In general, the cows' udders are softer and the SCC has been halved from about 120,000 last year to 60,000-70,000 this season."

Milk flow is up 850 litres/day, the kilograms of MS are up 76kg, fat has so far peaked at 4.8% (4.6% last season) and protein is travelling at 4.0% (3.9% last season).

Allan Hain, the Australian pioneer of the probiotic conversation, sources high-spec ingredients for Probiotic Revolution from Austria, Germany and North America.

He says the results all come down to having billions of colony forming units per gram (strength), viability (shelf life) and micro-encapsulation (protection), so they reach the lower GI tract where probiotics do their best work.

"Most people usually focus on single-strain yeasts. However, the probiotics and enzymes also have a synchronistic action in the rumen, and when they are formulated in the right combinations at the right strengths, they make an extremely powerful product which is what we're seeing here," Hain says.

Townsend says the savings on antibiotics, along with the knowledge that his animals can fight most infections themselves has been empowering.

"I'm not constantly worrying about mastitis and if it does appear, most of the time she'll push through it herself without antibiotics because she is healthy enough in herself to fight the infection," he says.

"And, I think that will be important for our industry going forward as vets get more stringent on dry cow antibiotics.

"From a cost perspective, our production so far this season is up 10% with the same amount of cows, the same amount of feed, and nothing else done differently outside of really putting the work in on the lead feed this year.

"And, we have another year under our belt building the entire herd's immune systems."

Dianna Malcolm has returned to New Zealand after 20 years in Australia as the former co-owner of profile show herd, Bluechip Genetics and co-owner/editor of all breeds magazine CrazyCow In Print. She now operates her public relations business, Mud Media, in Canterbury.

THANKS

Thank you for taking the time to consider what lies ahead in animal health.

We will continue to challenge the status quo, and to push forward with meaningful probiotic solutions for you.

WE ARE HERE TO HELP, SO PLEASE DON'T HESITATE TO GIVE US A CALL.

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