

GREEN TO GOLD

| Spring 2023

Inside this issue:

Simon Scott's reinvention success

Pages 4-5

Flexible milking options - how it works

Pages 6-7

Methane research update

Page 10

SLICK gene - developing heat tolerant animals

Pages 14-15

 **LIC**[®]
LIVESTOCK IMPROVEMENT

A busy year gone, a busier year ahead



Mike Rose

Bill Gates is credited with saying "People overestimate what they can do in one year and underestimate what they can do in 10 years." While I agree with this statement, I recently had to do a year in review for the LIC Australia business and was surprised with how many events and activities we have managed to pack in.

Our aim is to engage with farmers, providing them with up-to-date information and knowledge to support their herd improvement goals and farm business. In this past year, we have taken this to the next level, with the increased number of activities achieved. These include a farmer study tour to New Zealand, three roadshows in Australia with guest speakers who are experts in their fields, attending numerous field days, conferences, and hosting workshops with farmer groups. On top of this, our team provided AI training in both New Zealand and refresher courses in Australia.

We also had a visit to the manufacturing facility that produces all of LIC's heat detection products. These are made right here in the Hunter Valley NSW, and are exported all over the world.

We already have more in the pipeline for the coming year, including plans for spring mating management workshops, and a New Zealand study tour for 2024.

This latest edition of Green to Gold covers a lot of ground, including articles showcasing Australian dairy farmers having success with LIC genetics. Take a closer look at some exciting new genomic sires which have been made available, and deep dive into the latest methane and heat tolerance research. I hope you enjoy the articles we've prepared, and if you are joining cattle for spring, may this be successful.

Happy farming,

Mike Rose
Country Manager Australia

Introducing... Lannah de Jager Dispatch & Inventory Officer

Our latest, great addition to the LIC Australia team is Lannah de Jager. Lannah's role as Dispatch and Inventory Officer is tasked with managing the inventory and dispatching for LIC Australia's product offering.

Having not originally come from a rural background, Lannah's interest in agriculture started with a love of horses and animals. Eventually, this led into working on a pig farm for almost 7 years. During this time, she obtained both Cert 2 in Agriculture and Cert 3 in Pork Production.

Lannah says the experience she gained from breeding and raising stock was invaluable. She would also AI the pigs, let them farrow and then look after the babies until they were old enough.

With a couple of months at LIC now under her belt, Lannah also works at the local cattle saleyards where she has worked for the last two years.

"My interest has grown even more during these years, and I have accumulated 25 beef animals that are run on two properties in the Wangaratta area."

"I like all aspects of my new role. I enjoy talking with different people and learning everything and am really interested in how LIC and the industry works as it's different to the piggery."

Mike adds, "It's been great having Lannah join our team, someone with an understanding of agriculture and also experience with logistics and administration has allowed Lannah to get up to speed and quickly provide support to our team and farmers".





by Simon Worth,
LIC Livestock Selection Manager

From the Breeding Desk

One of the highlights of the year for LIC's breeding team is the recent rounds of on-farm inspections of potential bull dams throughout the country, closely followed by last month's hosting of our breeders in May (who had a bull included in one or more of the 2022 Premier Sires teams) in Hamilton, New Zealand.

Breeders are the 'engine room' of the AB industry, so LIC's Breeders' Day is an event our team truly enjoys, and it represents an opportunity to show our appreciation to the industry players who contribute so much.

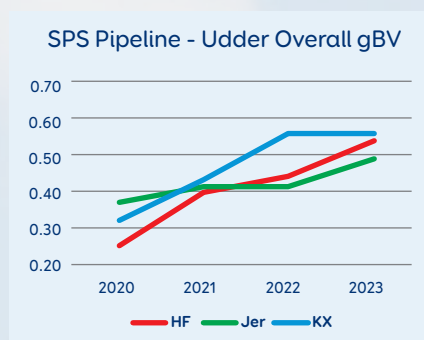
The focus on genomic breeding worth is very apparent, but it's encouraging to see exceptional depth and options across, and within, the breeds. Of particular note is the level of udder conformation LIC has available. On review, the average of the udder overall genomic breeding values (gBVs) of bulls available in this year's catalogue is impressive.

There's more to come in this space. The 'pipeline' is the description we give to those bulls yet to receive a daughter proof.

Average Udder Overall gBV of Bulls			
	HF	Jer	KX
Genomic	0.71	0.61	0.75
Daughter Proven	0.73	0.50	0.68

These averages are from the
2023 NZ LIC Genetics catalogue

The best of these emerging bulls will be selected for various teams, however, across the entire pipeline (and across 180 bulls per year), the trend we're seeing in the udder gBV is also very encouraging.



The gains we've made over time are a consequence of a deliberate focus on the traits that farmers want.

Clearly this is heavily influenced by the national breeding objective set by Dairy NZ (BW), but LIC's breeding team has always placed additional emphasis on specific traits, such as fertility and udders. This is reflected in LIC's internal index that we utilise for breeding decisions, the Livestock Selection Index (LSI).

Although LSI has put us in good stead, we're eager to understand if this is still 'fit for purpose'. On this note, over the middle of this year, we'll be embarking on an extensive series of farmer meetings, and other forums, to understand:

- What are the farming systems of the future?
- As a result, what is the cow of the future?

Clearly the answer to these questions will differ from location to location. However, we want to understand the changing landscape, especially because breeding is a long game.

The findings from this project will be utilised to help us shape the future make-up of our LSI.

I'm sure you'll agree that in 2023 there's an abundance of options across the breeds. There's no doubt that a good number of these bulls are set to make a significant impact on the national herd.

I'd like to share my appreciation and recognise the excellent relationships we have with the NZ breed associations. These have culminated in a number of joint venture bulls making the grade through either the Discovery Project (Holstein Friesian New Zealand) or Jersey Future (Jersey New Zealand).

All the very best for the months ahead. From the breeding desk, we look forward to spring where we will witness the emergence of the new graduates (20 code bulls).

During reinvention, some things never change



During a time of huge change and reinvention on Simon Scott's farm at Barongarook West near Colac in south-west Victoria, one thing has remained steady - Simon has never strayed from LIC genetics.

Over recent years, Simon has shifted from conventional farming to organic and regenerative farming. He has also gone from split to seasonal calving, and from twice-a-day milking to three milkings-in-two days.

For the past 25 years, Simon has been loyal to LIC, and he has no plans to change.

"I've been happy with the cows and the service from LIC. They've got a good selection, so you get plenty to choose from," he said.

"Their cows suit our system because we're pasture-based, low-grain input, like New Zealand systems."

Simon, who farms with his wife Linda and their five children, uses mostly Jersey and KiwiCross® bulls, with the occasional Friesian.

"A lot would be three-way cross, but we don't have a specific plan," he said.

"We've been using LIC exclusively for 25 years and have always had a cross-bred herd. I like the smaller cows because the farm gets pretty wet in winter and seems to handle smaller cows better than the bigger Friesians."

"I look for a reasonable size, high components, low volume, good cell count cows and cows that can handle once-a-day milking."

Simon has been breeding in anticipation of a change to his milking routine. "Being able to handle once-a-day milking is a trait we select," he said. "I had it in the back of my mind and had been building up to that for a few years. I wanted a versatile animal that you could milk, once, twice, or whatever, and LIC was able to deliver that."

In April, Simon hosted LIC FarmWise New Zealand based farm consultant Brent Boyce as part of an Australian tour organised by LIC. The tour had support from the DemoDAIRY Foundation to discuss flexible milking options.

Simon is the third generation on his farm and he bought the last parcel of land two years ago from his father, Lionel.

Until two years ago they were conventional farmers, peaking at 600 cows with a cow to the acre, a lot of out paddocks and up to four staff.

"We made the transition to regenerative, and we also went organic," Simon said. "This year we will peak at about 230 cows on 680 acres, but we'll probably move up to 280 next year. We also run 50 beef cows."

"The first couple of years of the transition was tough but it's good now and improving all the time and we're going to stick with it. We've made a lot of changes and keep trying to work out what best suits the farm."

Simon jokes that he's made the massive changes because he's lazy, but in reality, he wanted to have a simpler system that improved profit, was better for the land and the cows, and created lifestyle benefits.

While production has dipped a bit, profit has never been better thanks to cost savings and a healthy milk price.

Most of the land was cleared when the farm was bought by Simon's grandfather and "Over the last 80 years they put fertiliser on like it was going out of fashion".

The move to organic and regenerative farming has helped. "We're building carbon in the soil," Simon said. "The soil tests show us we've had paddocks go from about 4 per cent carbon to 7 or 8 per cent, and all the nutrients are fine."

"When we were conventional, we couldn't get over three Brix in the plants, now we're up to about 15."

They have also reduced their land holding to run the more streamlined business.

Their new fertiliser program is liquid worm juice but no synthetics. It only costs about \$2,000 a year for the whole farm compared to \$100,000 which was previously spent on fertiliser.

"With the \$100,000 we spent on fertiliser, when we turned it off, I used that money to buy extra hay and grain for that transition phase," Simon said.

"When we were conventional and milking twice-a-day, we were putting out 200 units of nitrogen across the whole farm."

Simon no longer cuts hay or silage and instead buys hay from a friend who is certified organic. "It adds to the fertility of the farm," he said.

He has sold all his hay making equipment, significantly reducing stress levels around harvest time.

Traditional split calving was dropped, and Simon transitioned all the spring calving cows over to calve from February 22. "Going to once-a-year calving, it's just set and forget," he said.

The latest milestone change was introducing 3-in-2 milking just over a year ago, milking every morning at 7am and every second day at 4pm.

"When we first went from twice-a-day milking to three milkings-in-two days, we did it with the spring-calving cows," Simon said. "We dropped about 5 per cent production but we saved labour and electricity, which is a big killer. "We were getting just on 500 kgMS per cow, last year we got 430 and expect about the same this year, which I'm happy with."

"We used to feed 2.5 tonne of grain but we're back to 600-700 kilos. When you weigh it all up, we're not doing the production we were doing but we've cut the costs. I'm in the Dairy Farm Monitor Project. Our earnings per kilo before interest and tax last year were much higher than the average. Some of the other farms get big production, but at big cost."

Originally with four staff, numbers have been cut to only one milker working an 11 day fortnight with five afternoons off.



Simon adds, "I don't want to get up at 5 o'clock in the morning to milk cows. I talked with my LIC rep Mike Waite about lifestyle balance, and he suggested flexible milking hours."

Simon also watched LIC videos to guide the change and followed farmer advice to cull any cows that have ongoing mastitis problems.

"Before going organic, I did a lot of research on once-a-day milking and watched LIC YouTube videos, which is the only place to get good info on it," he said.

"Our fertility is good and the cows we have now are suited to our system."

Simon may have more changes on the way. "3-in-2 has been good for 12 months but we may tweak it and go 11-in-7 or maybe 10-in-7 to have that consistent routine each week. At the moment we alternate weeks - one week 11 milkings, the next 10.

"The only thing I don't like about 3-in-2 is that it changes every week which is difficult for planning."

"I couldn't go back to twice-a-day. I've got five kids and I want to have time to run around with them. If I look back on the last 20 years, I've missed out on a lot of that stuff."





Australian farmers look at flexible milking options

A visiting New Zealand pasture based flexible milking options expert is predicting a surge of interest in different milking routines in Australia.

FarmWise farm consultant Brent Boyce, who fostered and developed the concept of flexible milking options in his home country, toured Australia in May this year and found growing interest in the concept.

Mr Boyce, who coined the terms 3-in-2 and 10-in-7 milkings, is encouraging all farmers to look at different options that could create lifestyle and profitability benefits.

"It's a bit foreign for some farmers in Australia but there's a lot of surprise about what is possible," he said.

"It means you can have a sleep-in on a dairy farm – that's something unheard of for centuries."

Less than 40 per cent of New Zealand farmers milk twice-a-day all year and Mr Boyce encourages Australian farmers to at least look at the options.

"It's coming," he said. "There's a tsunami of interest because people can see they can make a difference in their lives and businesses."

"We live in a volatile climate and we have to be flexible in how we approach businesses. I don't tell a farmer what to do but I make a lot of suggestions."

Mr Boyce said farmers who have a robust pasture-based dairy system won't lose production if they follow some simple ways of changing but they stand to make more money, improve their mental health, gain significant lifestyle benefits and get happier and healthier cows.

"People ask if they will lose production, when I answer that you'll make more profit it probably answers the question for them," he said.

FarmWise is a consultancy business within Livestock Improvement Corporation (LIC) and Mr Boyce's Australian tour was supported by the DemoDAIRY Foundation. Mr Boyce has 28 years of experience as a dairy farm consultant, including being named New Zealand's farm consultant of the year in 2016.

Mr Boyce describes flexible milking as a "game changer". He came up with the term '3-in-2' in 2001, while working with a farmer who had reverted to 16-hour milkings.

"He was doing cups on at 5am, 9pm and 1pm the next day but it was too tough. He was getting smashed and the cows were struggling," he said. "I said to myself – does it have to be a true 16-hour milking – it could be a different split, so we did 5am, 7pm and 11am the next day which became a 14-16-18-hour split."

The concept gained traction. "More farmers thought it was a good idea from Christmas because the cows didn't lose production because they'd already peaked. I called it 3-in-2 and that became internationally quite famous."

The idea grew in popularity after Mr Boyce presented his ideas at a 2007 once-a-day milking conference. "People were trying to work out how to do once-a-day. It was more of a curiosity, but by the end of it they were saying something is going on here."

Fifteen per cent of Mr Boyce's clients milk once-a-day. "I'm a fan of all systems - every farm is different," he said.

"We tried to find something that would work better for people and 3-in-2 did its job for many years."

In 2016, as part of the farm consultant of the year award, Mr Boyce was asked to re-write the papers on 3-in-2, further expanding interest in flexibility.

"It's an incredible change," he said. "It's across every different system and every type of dairy farm."

In 2018 at a FarmWise conference, senior LIC scientist Steve Davis spoke on udder health. "This was the moment I realised we could do even more," Mr Boyce said.

"Steve said it was possible to milk cows twice-a-day twice-a-week and stimulate the udders enough and have similar production. The afternoon milkings rescue the udder tissue memory so it thinks it's on twice-a-day."

"It fired me up. We had 14-a-week on twice-a-day, 7-a-week once-a-day or in the middle 3-in-2 was 10 and a half milkings a week. I had a lightbulb moment - could we do other formats such as 11-in-7 or 10-in-7 and fill in the gaps."

Mr Boyce wrote a paper on 10-in-7 milking, with Monday, Wednesday and Friday like normal twice-a-day, the other days at 10am.

"This taps into sport for young people or for going out on Friday and Saturday nights. The issue we have as an industry is we're a 24-7 business in a weekend-based society. Dairy farming is a tough way to make a living and we need to become weekend centric. This way we have a life."

Mr Boyce added: "10-in-7 has gone crazy and it's gone around the world." He believes any farm could easily make the adjustment by adopting a 48-hour feeding system.

"It's all about the genetics - not the genetics of the cows, but the genetics of the people," he said. "The cows are way more flexible than we are so we have to adjust ourselves. You can choose any milking regime."

"If you go 3-in-2 or 10-in-7 you will typically lose 5 per cent production compared to twice-a-day, but you'll claw your costs down and you will end up with similar profitability and huge lifestyle benefits."

"You can work it to better capture pasture growth and peak milk and adjust things as you go."

Mr Boyce doesn't recommend going 10-in-7 if a farm has an issue with somatic cell count. "For those, I suggest 11-in-7, avoiding two days on the weekend of once-a-day," he said.

Some NZ farmers on once-a-day milking have gone to 9-in-7 with significant increases to their average weekly production.

"I like to see farmers tailor their flexible milking regimes to certain times of the year and to what their cows are producing," Mr Boyce said.

"It is quite popular in more pasture-based areas to go 10-in-7 from Christmas and then in mid-April to once-a-day and go to the end of the season like that."

Mr Boyce encouraged farmers to think about their options.

"Adopt it and then adapt it for your system," he said. "Maybe start with 11-in-7 and if you don't like it or can't figure it out, go back to twice-a-day. Nothing is broken, you haven't destroyed the business."

In an industry struggling to attract workers, Mr Boyce says flexibility is vital. "Where would I like to work if I was a young person coming into the business - a farm where I can get a sleep-in on the weekend."

"It means we have 470 milkings a year instead of 608. That means every fifth year is a free year for your shed's lifespan, the cows are doing 130 less trips to the shed so they last longer, they're in better health and their fertility is better."

"They're doing almost the same production as twice-a-day with a lot less effort and cost."

"I call it cow wellness. The cows and the people are better and at the end of it we're making more money."

While in Australia on the tour organised by LIC and supported by DemoDAIRY Foundation, Mr Boyce attended a Young Dairy Network forum in Terang and Colac and the group visited grazing operations at Branhholme, Tyrendarra, Mt Gambier and Colac.

10-in-7: how and why does it work?

Day	10-in-7
Monday	5am - 3pm
Tuesday	10am
Wednesday	5am - 3pm
Thursday	10am
Friday	5am - 3pm
Saturday	10am
Sunday	8am

INTRODUCING EXTRA GENOMIC BULLS FOR 2023

Holstein Friesian



121011 LOMBARDI MAVERICK S3F

A real outlier - Maverick, as the name suggests, breaks the mould. At Fertility gBV of 9.8%, it's exciting to see a Holstein Friesian bull with high production and larger liveweight ranking highest for fertility amongst the black and white bulls marketed this year!

Combine this with his -8.1 for gestation length, easy calving and being over 1.0 for udder overall, it's no wonder he's been added to the LIC Australia spring lineup.

Breeding Details

Breed F16
Pedigree CURRENCY x BEAMER

\$409/54%
gBW REL

NEW ZEALAND DETAILS

Genomic

NZ Breeding Values		0 Daughters	
Milk Volume (litres)	905	Fertility %	9.8
Fat kg	42	Body Condition Score	0.21
Fat %	4.7	Functional Survival	3.2
Protein kg	43	Calving Difficulty (cow)	1.3
Protein %	3.9	Calving Difficulty (heifer)	1.3
SCC	-0.27	Gestation Length (days)	-8.1
Liveweight	62	Beta-Casein	A1A2

NZ Evaluation Data

Traits other than production

Management	gBV	-0.5	0	0.5	1.0
Adaptability to Milking	0.56				
Shed Temperament	0.58				
Milking Speed	0.13				
Overall Opinion	0.53				
Conformation (0 daughters TOP tested)					
Stature	0.91				
Capacity	0.23				
Udder Support	0.87				
Front Udder	1.14				
Rear Udder	0.89				
Front Teat Placement	0.32				
Rear Teat Placement	0.26				
Udder Overall	1.06				
Dairy Conformation	0.46				

Holstein Friesian



122080 WITTENHAM CP POLLMAN-P S1F

Looking for the complete package?

Then look no further than Pollman. At a competitive 427gBW this heterozygous polled son provides a 50:50 chance of the progeny being polled. Sired by the polled bull, Polish, Pollman brings 86kgs of fat and protein gBV to the table, and a 60kg liveweight gBV. He has a strongly positive fertility gBV and is A2A2. With his dam sired by Mastermind, he has an impeccable background in type traits.

Breeding Details

Breed F15J1
Pedigree POLLISH-P x MASTERMIND

\$427/45%
gBW REL

NEW ZEALAND DETAILS

Genomic

NZ Breeding Values		0 Daughters	
Milk Volume (litres)	119	Fertility %	4.9
Fat kg	54	Body Condition Score	0.20
Fat %	5.8	Functional Survival	4.0
Protein kg	32	Calving Difficulty (cow)	0.8
Protein %	4.4	Calving Difficulty (heifer)	1.7
SCC	0.14	Gestation Length (days)	-3.6
Liveweight	61	Beta-Casein	A2A2

NZ Evaluation Data

Traits other than production

Management	gBV	-0.5	0	0.5	1.0
Adaptability to Milking	0.35				
Shed Temperament	0.35				
Milking Speed	0.22				
Overall Opinion	0.50				
Conformation (0 daughters TOP tested)					
Stature	0.65				
Capacity	0.65				
Udder Support	0.28				
Front Udder	0.22				
Rear Udder	0.26				
Front Teat Placement	0.15				
Rear Teat Placement	0.11				
Udder Overall	0.32				
Dairy Conformation	0.66				

KiwiCross®



LIMITED SUPPLY!

**522077 TATAWAI
WRESTLER-ET**

Wrestler is an example of what can be achieved through embracing modern breeding practices. Wrestler is bred using a combination of high performing genomic and daughter proven sires to turbocharge genetic gain. The result is outstanding, with his Breeding Worth at 545/49, placing Wrestler in the very top group of bulls available. Combine this with very desirable fertility and management traits, and a fat and protein test edging toward 10%, it's a recipe for success. Limited stock available!

Breeding Details

Breed F9J7
Pedigree HONENUI x PROCLAIMER

\$545/49%
gBW REL

NEW ZEALAND DETAILS

Genomic

NZ Breeding Values		0 Daughters	
Milk Volume (litres)	487	Fertility %	7.1
Fat kg	59	Body Condition Score	0.26
Fat %	5.5	Functional Survival	4.1
Protein kg	43	Calving Difficulty (cow)	-0.4
Protein %	4.3	Calving Difficulty (heifer)	0.4
SCC	0.10	Gestation Length (days)	-2.0
Liveweight	30	Beta-Casein	A2A2

NZ Evaluation Data		Traits other than production			
Management	gBV	-0.5	0	0.5	1.0
Adaptability to Milking	0.55				
Shed Temperament	0.56				
Milking Speed	0.06				
Overall Opinion	0.59				
Conformation (0 daughters TOP tested)					
Stature	0.04				
Capacity	0.60				
Udder Support	0.35				
Front Udder	0.44				
Rear Udder	0.10				
Front Teat Placement	0.21				
Rear Teat Placement	0.27				
Udder Overall	0.34				
Dairy Conformation	0.52				

Jersey



LIMITED SUPPLY!

**322034 SCOTTSDALE KP
CALVARY-ET**

If larger Jerseys are what you are looking for, then Calvary should be in your tank this coming mating season. With a liveweight breeding value of 13kg, this is equivalent to 513kg in actual liveweight. He ranks number one for capacity and number two for stature among LIC Australia's marketed Jersey bulls. This, coupled with high milk production, conformation, and management traits, means we expect him to sell out quickly. Sexed available!

Breeding Details

Breed J16
Pedigree POPEYE x FLOYD

\$397/46%
gBW REL

NEW ZEALAND DETAILS

Genomic

NZ Breeding Values		0 Daughters	
Milk Volume (litres)	-241	Fertility %	5.6
Fat kg	38	Body Condition Score	0.32
Fat %	5.9	Functional Survival	3.6
Protein kg	16	Calving Difficulty (cow)	-1.1
Protein %	4.4	Calving Difficulty (heifer)	-2.1
SCC	-0.08	Gestation Length (days)	0.1
Liveweight	13	Beta-Casein	A2A2

NZ Evaluation Data		Traits other than production			
Management	gBV	-0.5	0	0.5	1.0
Adaptability to Milking	0.61				
Shed Temperament	0.62				
Milking Speed	0.18				
Overall Opinion	0.70				
Conformation (0 daughters TOP tested)					
Stature	-0.22				
Capacity	1.00				
Udder Support	0.64				
Front Udder	0.47				
Rear Udder	0.92				
Front Teat Placement	0.15				
Rear Teat Placement	0.53				
Udder Overall	0.72				
Dairy Conformation	0.91				



Farmers are one step closer to breeding more climate-friendly cows

Methane research still showing promising results

A research programme run by New Zealand artificial breeding companies LIC and CRV, has confirmed bulls' genetics play a role in how much methane they emit, highlighting the potential for farmers to breed low methane-emitting cows in the future.

The research, funded by the New Zealand Agricultural Greenhouse Gas Research Centre (NZAGRC), measures methane emissions from the burps of young bulls set to father the next generation of New Zealand's dairy cows.

Results from the last two years, where the feed intake and methane emissions from 496 bulls were measured, found there is genetic variation in the amount of methane emitted after accounting for the feed eaten by the bulls, with the lowest bulls emitting around 15-20% less methane than the average.

LIC Chief Scientist Richard Spelman says these results are a big step forward for the research.

"The amount of methane a bull or cow produces directly relates to the amount of food it eats - generally speaking the more an animal eats, the more methane it will emit.

"But after accounting for differences in the bulls' feed intake, we're still seeing genetic variation in their methane emissions, proving genetics do play a role. We have a sliding scale from bulls that are low-methane emitters (less than 18g of methane/kg of dry matter eaten) to bulls that are on the higher end (more than 28g of methane/kg of dry matter eaten). This is the variation we were wanting to see and we're excited to use it to our advantage."

Spelman says the results show promise to help farmers meet environmental challenges.

"This methane research is a long-term project but it has the potential to make a real difference to farmers in the future by providing another tool to reduce their farm emissions. New Zealand farmers are striving to meet the challenge of being profitable and sustainable, and research like this will help ensure reducing a farm's emissions doesn't have to come at the cost of reducing its milk production."

CRV Grass-Fed Genetics Manager Peter van Elzakker says "It's pleasing to see that the first two years results of our trial align with the company's methane trial work with Wageningen University in the Netherlands."

"The findings in New Zealand are a significant step forward in our work to develop tools to help New Zealand dairy farmers reduce their emissions. They give all of us even more confidence genetics can be part of the solution."

Harry Clark, Director of the NZAGRC, is equally pleased with these early results.

"Breeding represents a long-term and cumulative way that farmers can reduce their greenhouse gas emissions. Low-methane selection is now available to sheep breeders and the signs are positive that we might be able to deliver the same for the dairy sector," he says.

It is also encouraging that the ICBF in Ireland have launched a genetic evaluation for beef cattle in Ireland. The methane measurement protocol being used in New Zealand is modelled on the Irish beef measurement system at the Tully Progeny Performance Test Centre (icbf.com/methane).

Richard Spelman says the next step in the research is to see if the genetic variation responsible for methane emissions in growing young bulls is replicated in their daughters.

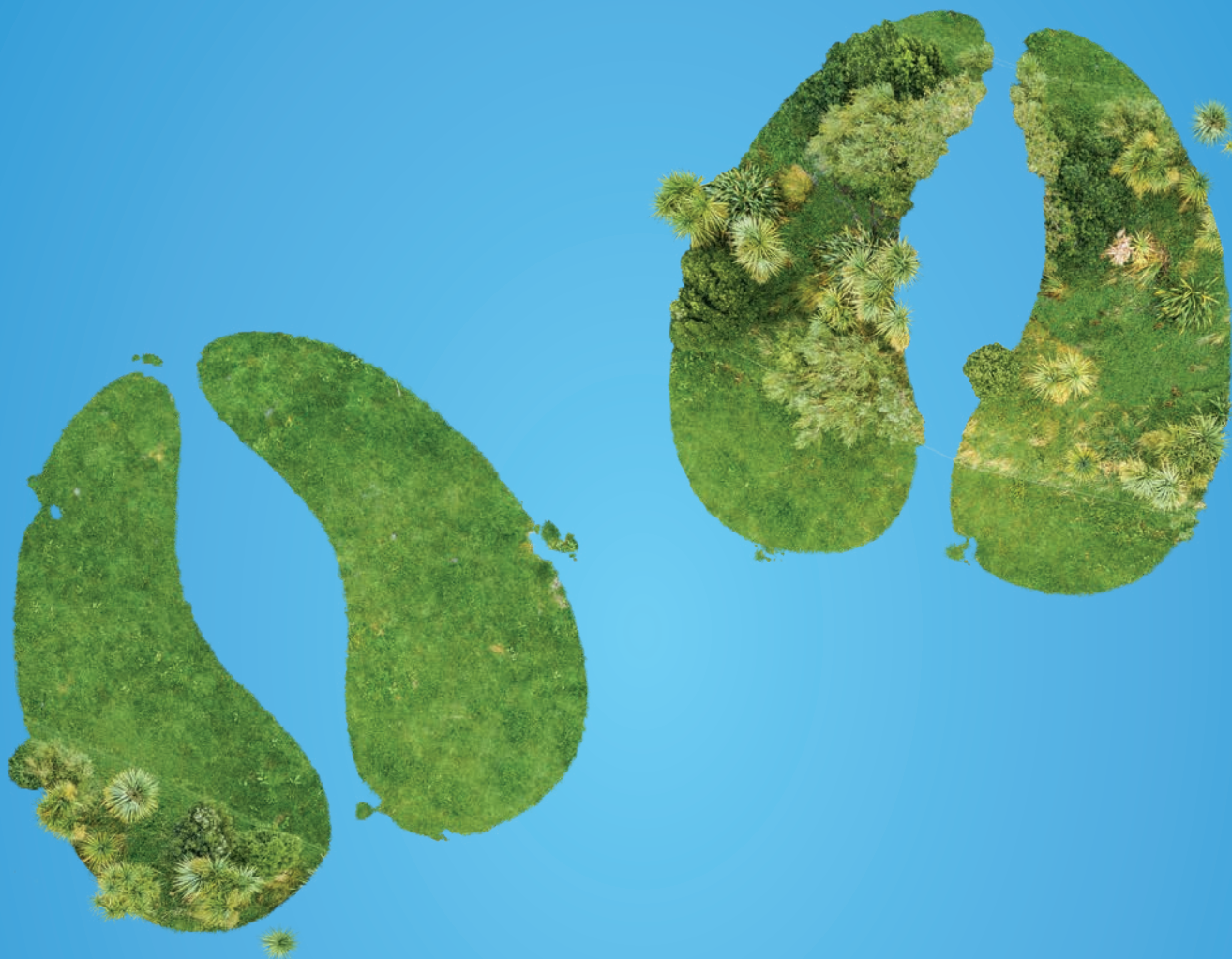
"In 2022, in partnership with Pāmu (the brand name for Landcorp Farming Limited with a NZ nationwide portfolio of farms), we inseminated cows with semen from bulls that we've identified to be high or low methane emitters".

The daughters are currently being born and will be raised on a single farm. We'll measure their emissions as growing yearlings and during their first milking season to ensure they're representative of their fathers. This is where the rubber will really hit the road in our aim to offer farmers a low-methane breeding solution."

Pāmu Chief Executive, Mark Leslie, says "Pāmu and Focus Genetics have an important role to play bridging the gap between science and commercialisation for the benefit of industry. We are pleased to see such positive results from the first year of this trial. It is vitally important that the agri-sector continues to move forward on emission reduction initiatives, and this trial is an exciting further step.

"This trial fits well alongside the dairy beef Progeny Trial at Renown Farm and the Informing New Zealand Beef (INZB) Progeny Trial at Kepler, which rely on our longstanding partnerships across industry, plus the progress we have made developing breeding values for methane efficiency in our sheep programmes."

The third year of the research is now underway with methane emissions being measured from approximately 300 young bulls from LIC and CRV's 2023 Sire Proving Scheme.



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NZAEL Interim Fertility Update

The March 2023 New Zealand Animal Evaluation run saw a couple of key NZAEL-led enhancements to the national Animal Evaluation system.

These changes included an interim update to the fertility breeding value (BV) calculation; this separated gestation length from fertility, and introduced gestation length as the tenth trait in Breeding Worth (BW).

Following the changes to fertility released as a part of the NZAEL3.0 update in December 2021, the fertility trait is now measured as calving-season-day (CSD) - the number of days between planned start of calving and calving.

The challenge, with accurate measurement of fertility under this continuous trait measure, is the influence of gestation length on calving date.

As shown by Figure 1 (p13), Cow 1 will have the same fertility measure as Cow 2, even though Cow 2 has a later conception date.

This highlights how short gestation length can influence the fertility BV and the need to account for this in fertility. These challenges wouldn't be an issue if the heritability of gestation length was low.



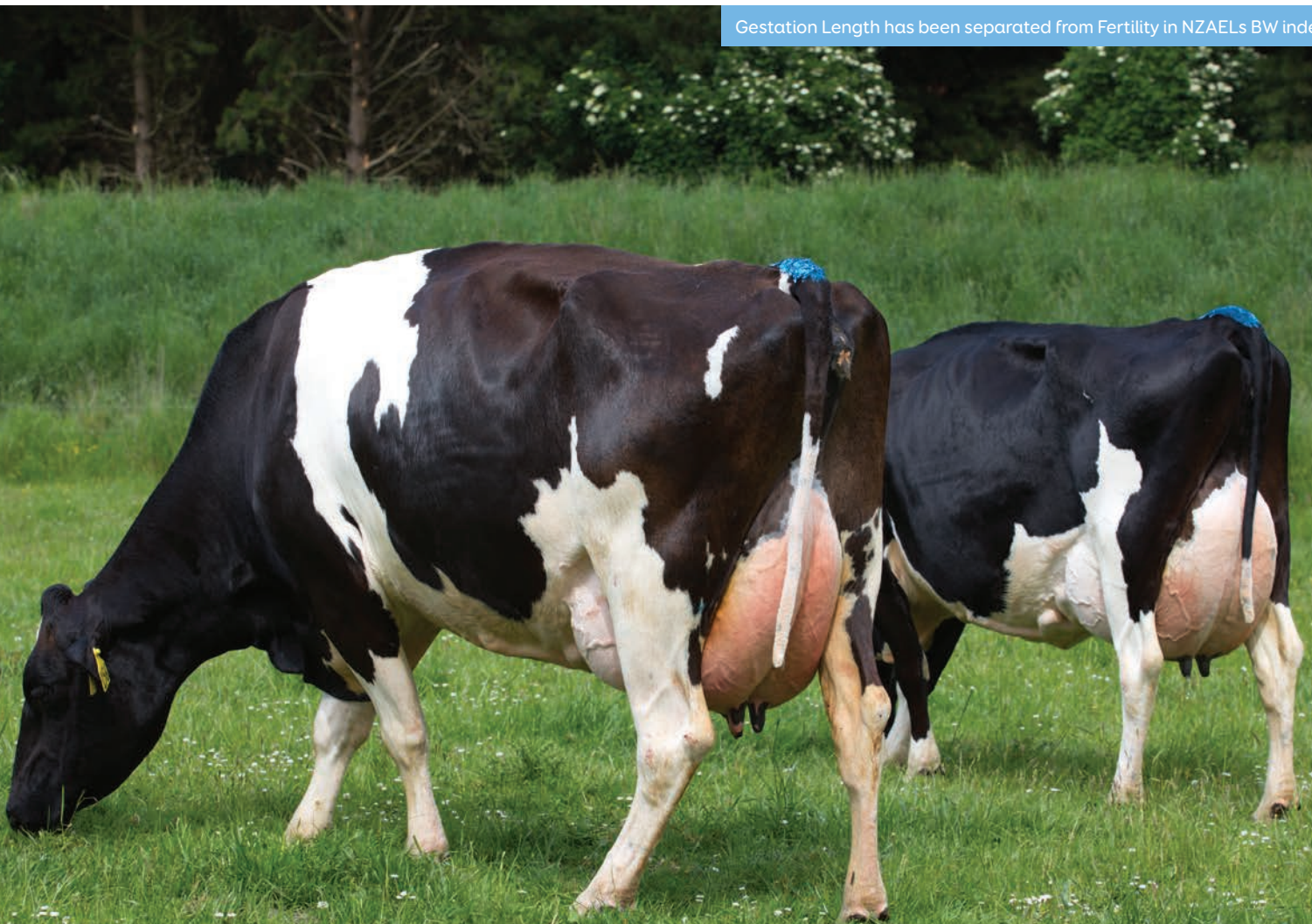
by Jayden Calder,
LIC Herd Improvement Analyst

However, with a heritability of greater than 50%, the extent to which genes control expression of gestation length is high.

Adding fuel to the fire is the low heritability of fertility (approximately 5%), therefore factors such as management and gestation length can cloud the estimation of 'true genetic fertility'.

For this reason, gestation length has been separated from fertility, providing a more accurate estimate of true genetic fertility for improved decision making.

Gestation Length has been separated from Fertility in NZAELs BW index



This is an interim solution implemented across both NZAEL and LIC models, as NZAEL works towards a long-term conception-based fertility measure in December 2023.

The breeding value definition remains as CR42; percentage of daughters expected to re-calve within 42 days from the planned start of calving, relative to daughters of a bull with a fertility breeding value of 0.

Gestation length is now included as the tenth trait in BW to account for the separation from fertility, and to recognise the value of shorter gestation length calvings.

Shorter gestation length drives value through more days in milk and more time to recover between calving and mating.

Gestation length has an economic value of -0.822 (\$/day) and a new economic value for fertility of 6.244 (\$/CR42 unit) has been implemented to account for the gestation length adjustment. The economic contribution of gestation length in BW is capped at -5 days BV to moderate selection pressure on the gestation length trait.

Finally, it's important to remind ourselves that genetics is only one component of reproductive performance.

Accurate estimation of genetic fertility is imperative to capture the genetic variation that exists for fertility. However, environmental and management factors will continue to have a significant influence on reproductive performance on-farm. Figure 2 highlights the increasing 6-week incalf rate associated with increasing fertility gBV, up to approximately 3-4 fertility gBV units

LIC bull teams were selected with the fertility changes in mind and the LIC Australia Catalogue 2023 was published with the new fertility breeding value.

For more information about these changes please refer to the NZAEL website.

Figure 1. Impact of differing gestation length on a calving date measure. *Source - NZAEL March 2023*

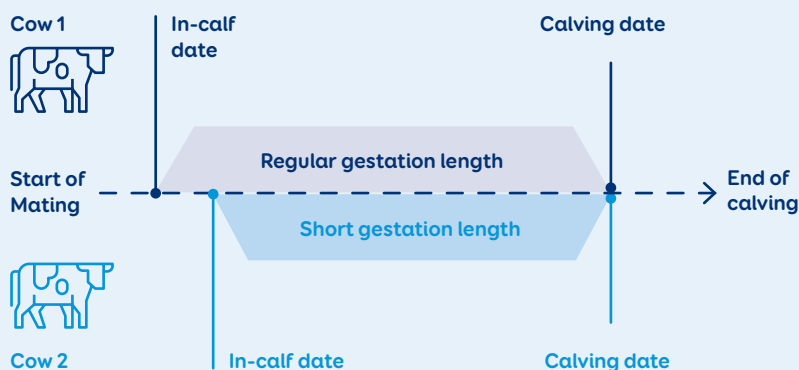
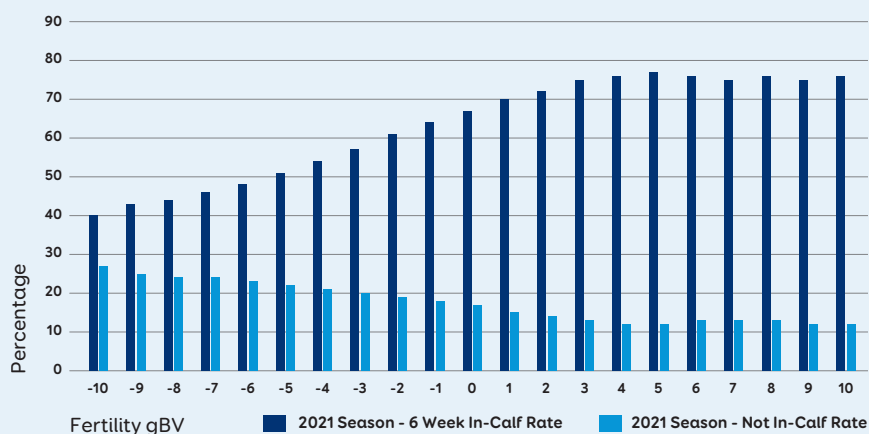


Figure 2. Relationship between updated Fertility gBV, (March 2023) and 6-week in-calf rate and not in-calf rate in >2.4 M cows with detailed pregnancy testing information recorded in MINDA, 2021 season. *Source - LIC March 2023*



With gestation length carrying a heritability of greater than 50%, the extent to which genes control expression of the trait is high.



SLICK cows at LIC's Innovation Farm



by Esther Donkersloot,
LIC Scientist (quantitative genetics)

SLICK: Developing Heat Tolerant Dairy Animals

Despite the last year not providing the heat waves we have come to know, it is expected that in time temperatures will rise. This will have an affect on dairy cattle performance and heat stress.

The 'SLICK' gene was discovered by LIC scientists in 2014. Cattle carrying the SLICK gene have a short coat and show improved heat tolerance. The SLICK gene has the potential to play a big role in the welfare of dairy cows in the future.

Ironically, this gene to keep cows cool was only discovered after LIC scientists first identified a genetic variation that made cows noticeably hairy and heat intolerant.

LIC's Dr. Steve Davis was aware of overseas work on heat-tolerant genetics and realised that the understanding of the biology of the hairy coat could help in pinpointing the exact location of the SLICK gene, a gene that was known to cause a short coat and improved heat tolerance from overseas research.

Sequencing of a target region of DNA from SLICK cattle by LIC's Dr. Matt Littlejohn enabled the team to discover the precise genetic variation that caused the SLICK coat characteristics.

This led to the start of a breeding programme at LIC in 2015 to produce heat tolerant dairy cows.

The first generation of the programme crossed the original SLICK-carrying breed, a Caribbean-based beef breed named Senepol, with New Zealand dairy cows.



From left to right: Esther Donkersloot (project lead), Dr. Steve Davis (LIC's SLICK pioneer), Gemma Worth (trial lead).



Left: A SLICK coat vs right: a normal non-SLICK coat

Where possible, the breeding programme employed embryo technologies to accelerate breeding worth (BW) in the offspring of the initial SLICK crossbreds.

Carriers of the SLICK gene were identified by genotyping each generation, including genotyping of embryo biopsies.

Alongside the breeding programme, LIC scientists have been gathering large amounts of data relating to lactation performance, coat characteristics, and heat tolerance on the emerging SLICK animals.

This research has been undertaken at LIC's Innovation Farm as well as in cooperation with Massey and Lincoln University.

The highlight of trial research to date is the heat tolerance comparison of SLICK cows versus their non-SLICK counterparts in milking heifers.

In Figure 1 it is illustrated that cows with the SLICK gene had a lower rumen temperature (0.5-1.0°C) compared to their non-SLICK control heifers when the Temperature Humidity Index (THI) exceeded 73 (around an ambient temperature of 26°C and a humidity of 60%).

THI is a commonly used metric used for heat stress and combines both temperature and humidity.

After 9 years of breeding, we now have SLICK sires with a BW approaching that of the best dairy sires on offer in the New Zealand industry, with only 1/32nd average content of Senepol genes.

The trial work remains ongoing to ensure that when genetics get released to New Zealand farmers LIC has a robust understanding of the performance of the SLICK gene.

This step should significantly increase the rate of genetic improvement, while increasing the number of SLICK animals on the ground, and helping with diversity in LIC's breeding programme.

In Australia there has been interest in SLICK genetics locally, but the real action has come from animals being exported into tropical countries in South East Asia.

These countries are looking to SLICK genetics to increase the genetic gain while also providing greater ability to manage high temperatures.

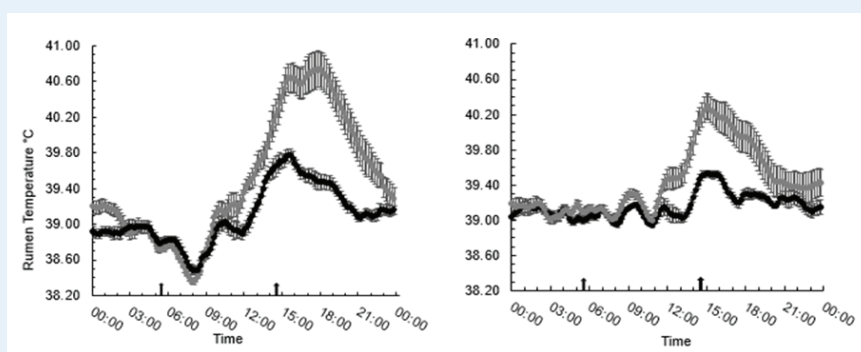


Figure 1. Mean rumen temperatures over 2 warm days for SLICK (black) and control (grey) heifer groups, where the THI and ambient temperature at 4 PM was, 74 THI and 26.3°C (left graph), and 75.7 THI and 27.8°C (right graph).



Australian tour group visiting Mabel the cow Morrinsville NZ

Sired by Beamer - 9606L in 271 days with 682 Ms - Mike Green, Tasmania



Gippsland District Manager Hilary Lunn assisting with heat detection application



Happy cows grazing at Janefield Dairy - Meander, Tasmania



Tasmanian District Manager Rowan Priest investigating a different type of milking operation

Top performing Priests Sierra daughter. Brendon Whites farm - Waikato NZ



Walcha Dairy, NSW

Western District - South Australia farm tour group April 2023



Farmer field day held in February 2023 - Janefield Dairy, Meander Tasmania



Jersey herd, Edgecombe NZ