

Working to **secure your future**

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GRASSROOTS

Inaugural NZ Study Tour Special

Pages 6 - 20



There's no 'I' in Team

Pages 2-5

Welcoming James Simpson

Page 23

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Reliability

There's no 'I' in Team.

Don't overlook reliability when assessing whether young bulls will fulfil your breeding aspirations.

What does it mean, and just what kind of impact does it have?

by Jayden Calder, LIC Herd Improvement Analyst

At mating, the choice of bulls to sire the next generation of replacements is many and varied: daughter proven or genomic? This bull, or that bull? A team of five bulls or of ten bulls? All decisions require a level of trust in the quality of animal evaluation information that sits behind bull selections.

The engine room behind LIC bull selection is the LIC genomic evaluation model. Over the last five years there has been a significant increase in both the number and quality of genotypes used for genomic evaluation, leading to better estimations of genetic merit. Advances in genomic prediction has enabled for widespread use of bulls at a young age, years ahead of the traditional daughter-proven product.

While this reduction in the sire generation interval has huge benefits for increasing rates of genetic gain, it's important to not lose sight of the practical application of bull teams on-farm, more specifically, the reliability of gBW and the appropriate use

of a team of young genomic bulls.

For all traits, reliability indicates the confidence that an animal's gBW (or individual breeding values) are a measure of their true merit and is measured on a scale of 0 to 100%. The breeding value for each trait has an associated reliability and will change over time with the addition of more information from sources like ancestry and daughter information.

The gBW index is a combination of breeding values and economic values for 10 traits that have measurable economic value to New Zealand dairy farmers. Changes to gBW are not limited to the addition of new information; factors such as economic value updates and model changes also influence gBW changes. Ultimately, changes to gBW provide a more accurate ranking of bulls on their expected ability to breed profitable and efficient replacements, while reliability of gBW serves as a useful indication of the amount of information behind the estimate.

Without a genotype, a young bull will have a gBW that represents his parent average genetic merit and will carry a gBW reliability of 30-40%. At this early age it is not known whether the bull received a 'favourable' or 'unfavourable' combination of genes from sire and dam.

Cue the value proposition of genomics:

Take the same bull and add the information from his own genotype and the gBW reliability will increase to around 50-60%. At this level of reliability, movement in gBW is still expected once daughter information is obtained for a young genomically-evaluated bull. However, the accuracy of this early genomic prediction provides a far greater estimate of lifetime genetic merit over and above what can be obtained through parent average information alone.

What does this mean for bull selections? Putting all your eggs in one basket, by choosing only a couple of young genomic bulls, opens the door for differences in team gBW expected vs team gBW delivered. But this should not deter farmers from selecting young genomic bulls, as early access to these

genetics is an opportunity to get ahead of the pack. Picking an adequate number of bulls means that the team gBW delivered will match the team gBW expected, smoothing out any upward or downward movements in gBW at an individual bull level. Finding the sweet spot between gBW gain and target number of bulls will ensure that the risk versus reward is balanced appropriately, while maintaining genetic diversity across the herd.

Table 1 provides estimates of team gBW reliability under increasing numbers of young genomic bulls. The 'sweet spot' is around 6-10 young genomic bulls which will balance team gBW with team gBW reliability. Selecting more bulls will further increase the team gBW reliability, however, may compromise genetic gain through having to select additional bulls.

Number of Young Genomic Bulls	Team gBW Reliability (%)*
1	52
2	76
4	88
6	92
8	94
16	97

Table 1: Estimated team gBW reliability for varied numbers of young genomic bulls

The team approach is a non-negotiable principle to a balanced breeding strategy which should always be considered at the time of making bull selections.



Getting the balance right will manage the potential variation at an individual level, while breeding the best cows for your herd of the future.

Genomic scorecard

To demonstrate what can occur to a bull's genomic breeding values (gBV) before-and-after daughters start milking, Figure 1 provides a comparison showing how the 2020-cohort of Holstein Friesian bulls ranked according to the milk protein gBV in June 2023 (before daughters started milking) and in June 2024, once milk recording data had been captured. The green quartile indicates the bulls that have the highest ranking for milk protein

through to the yellow quartile, indicating the lowest.

As daughter information was captured throughout the season, by June 2024 we were able to see a re-ranking occur. The top and bottom quartiles have remained largely where they were predicted to land based on the modelling, with the most variation occurring in the second and third quartiles (orange and blue). The results are very similar across breeds (HF, FxJ and J).

This suggests that LIC's genomic model effectively predicts the best and worst performing bulls from that cohort for milk protein.

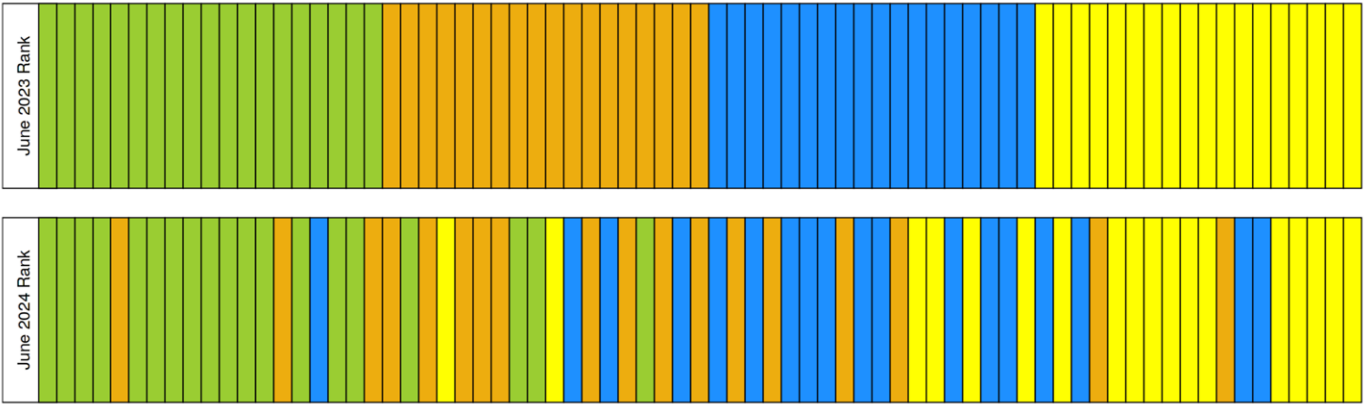


Figure 1. gBV Protein, before and after daughter proofs, for 2020-enrolled LIC Holstein Friesian sire proving scheme bulls. LIC, 2024



What makes the ideal cow?

Why production efficiency is key

When picturing the ideal cow, each of us may have something different in mind. But in any grazing system, the focus must be on production efficiency from every cow in the herd. That is, a cow who efficiently delivers a high amount of milk solids per kilogram of liveweight, with very little fuss, while quickly getting back in calf year-after-year.

While facing many external pressures, UK dairy farmers mustn't lose sight of the importance of efficiency - both from our cows and from our farming systems.

Efficiency underpins profitability and is especially important in the face of ever rising input costs and a volatile world market. Genetic gain keeps this moving forward, delivering ever increasing feed conversion efficiency.

Production data and actual liveweight information can be used to help farmers identify the most production efficient cows in their own herd and farm system.

Discovering the opportunity for the future within the herds of today

There is an exciting opportunity within our herds right now as we recognise the potential for our future herd! The production and production efficiency variation seen within animals in the same age group in the herd, gives us a glimpse of the potential for whole herd performance in years to come.

LIC quantified this for 3376 NZ herds in a 2023 study of mature (4-8-year-old) cows. The study showed a strong

relationship between production efficiency and genetic merit (gBW) at +0.4 kgMS per 1 gBW increase. There is significant variation in performance within herd age groups. The performance difference between the top quartile and the bottom quartile of mature cows within herds averaged 166 kgMS/year, while the genetic merit difference was 64 gBW points, (see Table 1).

The top quartile cows were around 30% ahead of their bottom quartile herd mates for milk production, production efficiency (kgMS per kgLWT), and genetic merit (gBW). This reveals the exciting opportunity farmers have to further improve performance, just by

breeding and milking more of these top end cows. The proof is clear - high gBW bulls breed high production and production efficient cows.

All of this highlights once again the usefulness of milk recording. Combined with liveweight information from annual cow weighing in mid-lactation, farmers can identify the most and the least efficient animals in their herds. The contribution of liveweight to production efficiency isn't anything new for farmers who have long had their eye on that key metric. They know that larger cows cost more in feed for growth and maintenance. Taking nearly an extra 300 kgDM to feed a 600 kg cow vs a 500 kg cow each year Recent Irish research confirms the usefulness of this as a production efficiency measure¹.

Actual liveweight data will highlight the most efficient animals in your herd. The ICBF has recently launched a new online tool to calculate efficiency once you've entered in your cows' mid-lactation weights. This will make it easy for farmers to select their most efficient animals for breeding.

Quartiles of performance ranked by kg milk solids/cow (fat + protein)	# Animals (n = 712,903)	Avg KgMS/cow	Avg DIM	Avg gBW	Avg Lwt gBV	Avg kg MS/kg Lwt
Q1	179,518	539 ⁺¹⁶⁶	263	198 ⁺⁶⁴	11	1.05 ^{+0.32}
Q2	178,642	479	257	175	8.7	0.94
Q3	177,800	438	251	158	7.2	0.86
Q4	176,943	373	240	134	5.5	0.73

Table 1. Within herd performance, ranked by quartile of milk solids production in 253 days, on average, for >700,000 4-8-year-old cows, milk recorded with LIC in the 2022/2023 season. Source: LIC, 2023

When we're looking at efficiency, it's the most productive animals combined with a favourable liveweight that are the most efficient, and these tend to be our crossbred animals. We've seen this across all grazing systems.

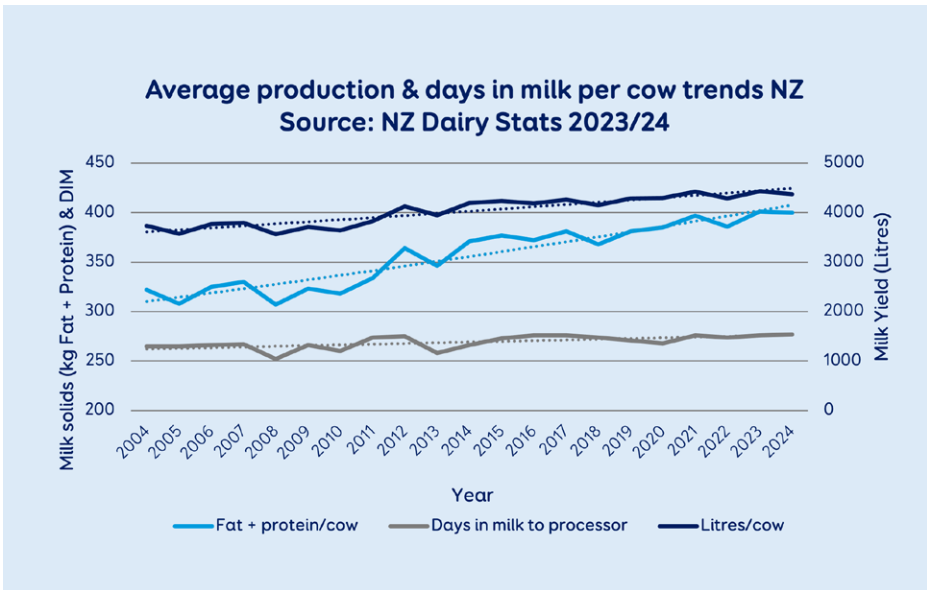
The value of crossbreeding

While we can breed for efficiency within any breed; Holstein Friesian (HF), Jersey (JE) or Jersey-Holstein Friesian crossbred (HFxJ), it's the HFxJ group of animals that have proven to be most efficient. In Ireland, research conducted by Moorepark, has shown that HFxJ animals (animals with more than 25% Jersey) produced 8.9% more solids per kgLWT when compared to HF across all parities (1.01 vs 0.92 kgMS per kgLWT).

The HFxJ group also maintained that efficiency into later lactations, whereas the HF hit peak efficiency in their third lactation (0.96 kgMS per kgLWT) and started to decline thereafter.

The end result was that the HFxJ group produced more kgMS per kgLWT across more lactations than the HF group, and they showed a linear increase in efficiency with the proportion of JE genes in the animals².

High genetic merit HFxJ cows show the greatest production efficiency and maintain that efficiency for longer. Therefore, crossbreeding is an invaluable strategy to increase efficiency in your herd.



Nevertheless, no matter your chosen breed, higher gBW consistently delivers greater production efficiency. In an LIC 2023 study, similar to the previously mentioned study, more than 840,000 cows with over 200 days in milk in 2022/23, were ranked by quartiles for genetic merit (gBW) within breed and assessed for production and other traits. Again, across every breed or breed mix the top quartile animals outperformed their lower gBW herd mates. On average, they produced more milk solids, were lighter in liveweight and had higher fertility breeding values, with the trend being consistent through the quartiles.

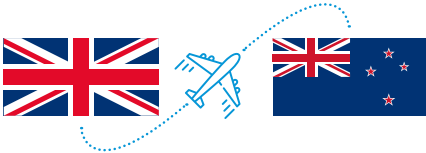
So, it's clear that using high gBW bulls will increase the efficiency of your herd and help you breed more efficient cows faster. As input costs rise, increased efficiency is vital to continued sustainability.

Using herd improvement tools, such as milk recording and capturing mid-lactation liveweights you can select your most efficient and fertile cows, breed them to high gBW bulls and step up to even greater levels of efficiency in your herd.



More information can be found by following the links below:

¹ <https://www.sciencedirect.com/science/article/pii/S0022030222007196>
² <https://www.sciencedirect.com/science/article/pii/S187114321002997?via%3Dihub>



Inaugural study tour provides UK farmers with invaluable lessons in genetics and Kiwi ingenuity on-farm

Late last year saw a significant collaboration between Cogent Breeding Limited from the United Kingdom and Livestock Improvement Corporation (LIC) in New Zealand.



In 2022, Cogent became LIC's exclusive distributor of genetics in Great Britain, extending LIC's pasture-based genetics offerings to farmers throughout Great Britain and also increasing the availability of the sexed products.

As part of the collaboration, Cogent and LIC hosted an inaugural study group tour with 14 farmers from around the UK including Isle of Man, England, Scotland and Wales visiting New Zealand in November 2024.

For their time in New Zealand, LIC and Cogent worked together to provide the visitors with a tailored study tour, including visits to the LIC Newstead site, the LIC Awahuri bull farm, as well as seven North Island dairy farms.

The main purpose of the tour was for the travelling group to learn about wearable technology, gain insight into breeding and pasture management, and observe LIC's role in the dairy industry - in New Zealand three out of four cows are sired by an LIC bull. Equally, there was the opportunity to visit and view varying farming systems with the intention of going back to the UK and potentially implementing similar strategies on their own farms.

The travelling farmers were accompanied on their travels by staff from LIC's New Zealand and Irish offices and Cogent UK, who assisted in ensuring the tour went smoothly and the visitors gained as much insight as possible.

Kapy Macown, International Marketing and Sales Support from LIC, says the study tour was beneficial for everyone that attended: the UK farmers, New Zealand farmers hosting on-farm, and Cogent and LIC, all of whom pulled positives from the week on the road.

One positive that stood out to Kapy was the interactions between the farmers in New Zealand with those travelling from the UK.

There was plenty of farmer-to-farmer discussion during the trip, with on-farm staff more than happy to have in-depth conversations about farm practices and the role everyone plays. Long hours were spent at each location, discussing its distinctive aspects and LIC's role in their operations.

"We saw some unique farms, and one that stood out had been converted from



Evie Rogers

forestry land to beautiful pastures, with great looking cows. It showed all the work behind the scenes, not only the breeding and pasture management, but also technology and everything you can think a professional setup needs," Kapy says.

"Being able to view all these different farming set-ups with their own challenges and unique aspects really showcased how varying landscapes, breeding plans and more can contribute to a successful and sustainable farming system."

The study tour provided a unique opportunity for the travelling UK farmers to witness first-hand New Zealand's innovative farming practices, breeding techniques and ever-changing technology.

"Between LIC and Cogent, the creation of this tour allowed for meaningful connections between farmers from opposite sides of the world, with the farmers returning to the UK with new ideas and strategies to implement," Kapy says.

Tour participant from Shropshire, Evie Rogers wanted to build on her existing skillset and experience within the dairy sector, and believed seeing different farms and set-ups in New Zealand would help her see a new perspective on dairy farming.

"New Zealand is known as the dairy hub of the world so there's almost no better place to visit, additionally the knowledge exchange with the people on the tour was really interesting," Evie says.

The most significant moment of the tour for Evie were the discussions at the LIC Newstead site with staff and the travelling group. The exchange of insights on current and future projects proved to be informative and valuable.

"My favourite insight, and one I will remember clearly was the discussion around Slick genetics and what it means for future heat stress in agriculture with climate change taking effect," Evie says.

For Evie, being surrounded by a diverse group of professionals with varied expertise made the trip a truly positive experience. The opportunity to gain insights into genetics, exchange knowledge, and expand her professional network proved to be immensely valuable for her career.

Cogent and LIC hope to make this an annual event and extend participation to non-LIC customers in the future.

"I think it's important for both companies. Our genetics are used throughout the UK and Europe and there's no better way to promote it to farmers than seeing it in the flesh," Kapy says.

Stay tuned for further insights into the trip, covering areas such as feeding, production, pasture management, animal health, reproduction, and staff management.



Transforming green grass to white gold

In late 2024, Cogent Breeding Limited and Livestock Improvement Corporation (LIC) took a group of dairy farmers from the UK on a study tour to visit their Antipodean counterparts.

The UK farmers explored Livestock Improvement's home base and visited seven North Island dairy farms over a week. In the 'Farming Tour of Middle Earth' series, British Dairying looks at the unique insights the UK farmers took from New Zealand's approach to farming, covering areas such as feeding, production, pasture management, animal health, reproduction, and staff management.

While the UK has had its share of unusual hot summers of late, New Zealanders are accustomed to dealing with four seasons in one day on a regular basis.

For dairy farmers this means being flexible and forward thinking in terms of pasture management and farm practices to ensure milk production – particularly since dairy is New Zealand's biggest export earner (worth around 8.7 billion GBP per annum).

Farmers in the Waikato region of New Zealand's North Island have become particularly adept at pasture management in extreme conditions, dealing with drought in summer and floods in winter.

During a particularly warm week in late 2024, a group of 14 farmers from across the UK got to see first-hand what it takes to turn grass into the proverbial white gold in New Zealand.

Travelling as part of the first ever Cogent Breeding Limited and LIC study group tour, the farmers visited several farms in the Waikato, battling the heat of the blazing Kiwi sun to see how New Zealand farmers have maintained milk production through a focus on homegrown pasture, reduced nitrogen and fertiliser use, and efficient cropping.

For many on the trip it was the first time in New Zealand, and it was an enlightening experience seeing the similarities and differences between the farming in the two countries. The aim is to make it an annual event.

Schooled in pasture

Owl Farm, a demonstration farm situated on the grounds of St Peter's School near Cambridge in the Waikato, has been reducing reliance on imported supplements and nitrogen fertiliser applications while maintaining the amount of homegrown pasture in the face of changing climatic conditions.

The farm milks around 360 cows on a dairy platform of 140 effective hectares. A long-time customer of LIC New Zealand, Owl Farm uses a range of technology to help it achieve its goals including LIC's MINDA™ herd management software, which allows for integration with other tools such as Halter® wearables and milk supply co-op Fonterra's on-farm smartphone tools.

Over the past nine years Owl Farm has been able to reduce its reliance on imported supplements (from 400 tonnes of dry matter to less than 100 tonnes) and increase the amount of grass and maize silage harvested on-farm (up from 80tDM to over 200tDM). The farm grows a range of ryegrasses (annuals and Italian), turnips, kale, maize and chicory, and as required will supplement feed with palm kernel mix.

Demonstration Manager Jo Sheridan says Waikato farmers tend to expect a feed deficit in January and February (New Zealand's summer) when the paddocks dry out.

"It's a case of securing feed to get through an acute feed deficit over summer and then being able to destock once pregnancy data is confirmed. We know we need to have seed in the ground by St Patrick's Day for when the rain comes. It's all about risk management and ensuring you can milk over summer and continue to grow healthy calves that will set them up for the rest of their productive lives," she says.

"Every summer we condition score each paddock looking at proportion of desired species along with clover and plantain percentage. Anything that is scored 1 goes straight into annual ryegrass followed by a spring sown crop (ready for next summer). Anything that is rated 2 or 3 will have a strategy of a two-to-three-year lead-in time before it's ready to crop. You play to your strengths – graze on annuals over winter, feed crops over summer, then perennial pasture from early March, with a 12-month lead-in."



Part of Owl Farm’s strategy has been to switch to pasture that suits the changing climate and at the same time reduce its reliance on imported feed, which in turn lowers the farm’s overall emissions intensity values. This is in conjunction with a strategic artificial breeding programme supported by LIC using sexed semen and DNA profiling to selectively breed replacements from high genetic merit cows. This targets high feed conversion efficiency and low emissions along with selection pressure for productive traits.

“We know that palm kernel with a high footprint, is costing us from the carbon dioxide emissions point of view. Over time we’ve been trying to swap it out for what we can grow on-farm (without compromising animal wellbeing outcomes) and we’re trying to find the forage solutions that suit our changing climate. So forages that we know will grow well in hotter soil with less, irregular rainfall that we can capture as feed throughout our season,” Jo says.

Efficient nitrogen use also plays a role. Just like in the UK, New Zealand has rules on the amount of synthetic nitrogen that can be applied to grazed pasture, ranging from 120 kilograms of nitrogen per hectare per year (kg/N/ha) on sugar beet to 300kg/N/ha for grass. In New Zealand, synthetic nitrogen application to grazed pasture is capped at 190kg/N/ha. Dairy farmers must record and report their nitrogen use annually.

Over the 2023/24 season, Owl Farm used just 90kg/N/ha, down from 161kg/N/ha in the 2017/18 season. In turn, its emissions reduced by 2,697kg/CO2e/ha.

“We want to work with nature’s biological nitrogen system. So we want to match the supply of nitrate with the uptake of nitrogen from our ryegrass plant. We make sure to put the nitrogen on when the soil temperature and moisture is conducive to the plants growing.”

The UK farmers were particularly impressed with the pasture development at Owl Farm remarking on its lushness compared to many other farms they had driven past during the tour.

Defining ‘grass-fed’ and opting out of palm kernel

An hour south of Owl Farm, another farm is taking steps to refine its pasture management and adjust its feed. Southern Pastures’ Manako Farm in Tokoroa (near Rotorua) is a 429ha farm comprising 357ha effective dairy, 48ha of bush and wetlands and 12.8ha forest, with a 1000-strong herd split into two mobs.

Back in 2012 when Southern Pastures took over the farm, 30% of the cows’ diet was imported supplementary Palm Kernel (PKE). The company was eager to change the feed regime and installed a new feed pad and infrastructure to allow it to incrementally swap out PKE and increase the amount of pasture produced on farm.

The farm is now PKE-free, although Southern Pastures Director of Farming, Mark Bridges, admits it has been a journey.

“We had to spend some significant dollars on getting prepared for that. You can’t just take 30% of something out of the diet. So we set up for the space of having supplementary feed infrastructure,” he says.

“One thing that we do a little bit different to others is we’ve set up what we call our 10 Star Certified Values, which are

audited by Assure Quality, a government organisation. All our farms are audited under this and have been since 2017.”

The 10 Star Certified Values stipulate each farm adhere to the following: grass-fed diet, non-genetically modified organisms, 365 days free-range, animal welfare, human welfare, no palm or tallow products, environmental sustainability, antimicrobial stewardship, climate change mitigation, no added rBST or other hormones.

“The key part of it all is that we are grass-fed. So we defined what grass-fed meant to us and then we’ve marketed that: 96% of our cows’ annual diet is grass-fed and this can include maize and silage. Grass silage includes winter grazing. So it includes anything that might be consumed by an animal outdoors and a natural environment.

“The 4% of the diet that doesn’t make that criteria can come in the form of New Zealand grown maize grain in the North Island or barley and wheat from the South Island, we can also use a little bit of dried distillers’ grain coming out of New South Wales, Australia as well,” says Mark.

Soil health is a crucial component of pasture management and Southern Pastures has introduced dung beetles to Manako Farm as part of a research trial. Research has found dung beetles improve pasture productivity, soil biology, carbon content, reduce surface



water runoff, and importantly also reduce methane emissions by tunnelling and burying activity. It also has permanent bee populations on all its farms as a natural means of pollination and preserving biodiversity.

“When I look at photos from 10 years ago, the grass was yellow. The land was barren. In our first year we grew a lot of clover, hardly any ryegrass. But over the years it’s just got better and better.”



Cogent Breeding Limited is the exclusive distributor for Livestock Improvement Corporation (LIC) genetics in the UK. LIC is a New Zealand farmer-owned co-operative that has pioneered some of the biggest innovations in modern farming including the systematic testing of milk quality, Long Last Liquid (fresh) semen, DNA technology to genomically identify and help select elite sires; and more recently a short gestation bull team bred to deliver offspring up to 10 days early.

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Not all cows are created equal when it comes to milk

In late 2024, following the continued success of their exclusive UK collaboration, Cogent Breeding Limited and Livestock Improvement Corporation (LIC) hosted their first New Zealand study tour, giving British dairy farmers unique access to some of the world’s most innovative pasture-based systems. The tour saw Cogent customers explore LIC’s home base and Manawatu bull centre as well as visit seven North Island dairy farms over an intensive week.

In this ‘Farming Tour of Middle Earth’ series of articles, British Dairying looks at the unique insights from this Cogent-LIC initiative. This piece focuses on two of the farms visited by the group; Rockland Farms in Aria and BBC Farms in Otorohanga. Both located in the South Waikato.

Across the world, dairy farmers are looking for ways to increase on-farm efficiency and milk production while reducing their emissions profile. The biggest contributors to greenhouse gases from agriculture are nitrous oxide from soils and methane from livestock and manures.

Many UK farmers are looking to reduce herd numbers to achieve emissions

goals; without of course, sacrificing milk production and profitability. They’re making progress. In the 2022/23 year, average UK milk yield increased 0.5% to 8133 litres per cow while the national herd size reduced by 10,000 cows (Source: Department for Environment, Food & Rural Affairs: Farm Business Survey 2022/23 – Dairy Production in England).

Artificial insemination with improved genetics is a leading factor in farmers’ achieving this balance. According to a recent AHDB report, the UK leads global sales of sexed semen with 84% of all dairy semen in the 12 months to April 2024 going through additional laboratory processing.

Cogent Breeding Limited sells more than 2.3 million straws each year to farmers across the British Isles, and abroad.

“Genomics offers us a huge opportunity to drive genetic gain on farm and improve the efficiency

of our base cows. But to do this we have to ensure only the best are put to sexed dairy, so breeding the best replacements,” says Cogent’s Managing Director Stuart Boothman.

It is a trend being seen worldwide. In New Zealand, 82% of the national dairy herd were mated through artificial breeding (AB) in the 2022/23 year (Source: DairyNZ, LIC, New Zealand Dairy Statistics 2022-23).

LIC was established in 1909 when the first organised routine herd testing service commenced. Today LIC’s services include herd testing, artificial breeding and data management solutions making it a cornerstone of New Zealand’s agricultural sector. Headquartered in Hamilton, LIC employs over 700 permanent staff, expanding to 2000 during peak dairy seasons.

This inaugural study tour aimed to provide the visiting farmers with real-life examples of the various breeding programs, farming systems, and herd management practices employed by kiwi farmers while also allowing participants to discuss and compare solutions to common challenges.



Rockland Farms

One of the farms visited in Aria, South Waikato/King Country, provided the farmers with an insight in using genetics to improve efficiency on-farm.

Matt and Emma Darke run Rockland Farms, a 1300-strong Jersey herd on what can only be described as “not dairy country”. Whereas most dairy farmers in the greater Waikato region enjoy flat, lush plains, Rockland Farms is 500ha of rugged terrain, where cows graze on 45° hilly pasture. A walk of up to 4.5km between paddocks influenced the couple’s decision to milk once a day rather than the traditional twice-a-day system.

Seventeen years ago, the farm changed to artificial insemination for mating, with Matt upskilling to save the need for a technician to come on-farm.

“Right back at the start I was told by different companies ‘the breed you

needed was a three-way cross’, a cow with low volumes, a bull with low volumes. So we wouldn’t put them under pressure on once-a-day. But it turns out it’s 100% the opposite,” Matt says.

Emma works alongside LIC to pick nominated straws and sexed semen.

“It’s quite hard picking a bull that’s going to work for what I class as a ‘herd sire’ that’s going to have an impact across a wide range of cows. You can pick a bull that will have an impact on certain cows, but if I’m wanting one or a group of bulls to do a decent job, the offspring need to be a lot better than their dams. The bull’s got to have high volume, great components and good BV’s on capacity and every udder trait along with protein, fat and the will to milk,” she says.

This approach has allowed Rockland Farms to make strategic decisions around culling and improve efficiency. In recent years the herd’s empty rate has

sat between 6-8%. The farm’s cows are also living longer and producing well into their later years.

“We cull on production rates, not on age,” says Emma.

Jerseys tend to have the lowest average liveweight across all ages (around 400kg) compared to Holstein-Friesians and Holstein-Friesian/Jersey crossbreds but are very efficient producers, converting around 11 tonnes of home-grown feed (and a small amount of additional palm kernel as required) to between 320-420kg/milk solids (MS) per cow annually. (Of note, in New Zealand’s milk price is calculated on milk solids not litres.)

Emma adds, **“Every best cow had a heifer. There’s 2,000 two-litre bottles of milk sitting up there in the paddocks every day and the cows bring them down for us.”**

Matt and Emma have refined their herd improvement roadmap over the years which has culminated in them regularly selling bulls to breeding companies - they currently have one of LIC’s top proven sires, Rockland LQ Berkly.

DNA parentage testing has further increased the farm’s efficiency, profitability and sustainability.





BBC Farms

An hour north, BBC Farms in Ōtorohanga showcased how herd genetics can be streamlined to improve Breeding Worth (BW: the measure of an animal's ability to breed profitable and efficient replacement heifers), Production Worth (PW: the measure of a cow's ability to convert feed into profit over its lifetime) and a farm's bottom line.

Named for the first initials of its owners, Barbara, Brian, and Craig Mora, (not the broadcasting company), BBC Farms milks 1700 Holstein Friesian and Holstein Friesian-cross cows across four farms, covering around 488ha in total. Each farm is run independently using contract

milkers. On average, the farms produce around 1500-2000kg of milk solids per hectare or 480-550kgMS per cow.

Having previously worked in the agricultural corporate sector – Craig in banking, and his wife Kylee at LIC – the couple entered farming in 2013 going into partnership with Barbara and Brian on a purchased 380-cow farm, to add to a (then) 220-cow farm that Brian and Barbara already owned. The family was soon able to expand operations and bought two farms and leased another, one of which they converted to a drystock farm.

Kylee brought her experience in genetics and technology back to the farm. Each cow is fitted with an



ear sensor and in 2023 they installed drafting gates in every dairy shed. Craig admits he took a bit of convincing.

"We bought ear sensors for mating and got health and nutrition information with it. I suppose in my mind nutrition was for a TMR system in Europe where the cows live in a shed. So I wasn't really a believer. But it was offered to us and we started using it. Our vet is really keen on it and it's been able to show some pretty cool stuff around transition diet, rumination, eating minutes and seeing what we can change. Our vet is now able to tell us which cows are likely to be empty based on their dry off and transition around calving," Craig says.

The farm herd tests quarterly, which helps identify low producers among the herd. They've found some of their smaller cows are some of their highest producers of milk solids – ultimately from using better genetics.

"Most people in New Zealand are a little bit scared of failing and are quite set in their ways. But between the four of us including Mum, Dad and Kylee we're a pretty good team. We've all got different aspects to what we bring to the farm. I'm not scared to change stuff," Craig says.

The golden rule is whatever they introduce has to be replicable across all the farms by all staff. This also applies to breeding decisions, which Kylee says "has to be easy so that staff are able to do it day-to-day."

This has included genomic testing, which the farm has been able to trial thanks in part to funding from a Fonterra-Nestlé partnership designed to help New Zealand farmers reduce on-farm emissions.

During the farmers' visit, Kylee was able to whip out her smart phone and provide the genomic testing details of tagged heifers and cows in the nearby paddock.

"There are years of breeding going into these things. I couldn't tell you about the fundamental differences between the cows by looking at them; but Kylee's got the information at her fingertips – DNA, milk production, BW, PW," Craig joked.

"We haven't always had this luxury. Going from milking 220 cows 12 years ago to milking 1700 cows now, we've



needed every cow we could get and that hasn't always led to us having a lot of choice, to be fair. We've tended to make a decision for mating based on paper – herd test data, BW and PW.

Craig comments, **"DNA parentage testing is the biggest thing we should be talking about as farmers if we want to cut emissions and have an efficient farm – looking at genetically superior cows."**

Location of Rockland Farm and BBC Farms



Since becoming the exclusive distributor of LIC genetics in Great Britain, Cogent has been able to combine their advanced sexed semen technology with LIC's renowned pasture-based genetics. This collaboration allows both companies to offer comprehensive breeding solutions, enhancing genetic diversity and efficiency for farmers across the UK. The collaboration aims to deliver greater value and profitability through innovative genetic services and herd improvement programs.

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Breeding excellence on British dairy farms

LIC has been active in the UK since the early 1990s, bringing its expertise in dairy genetics and herd improvement to British farmers. The collaboration with Cogent Breeding Limited further strengthened LIC’s presence, allowing for the distribution of LIC’s renowned genetics and grass-based farming knowledge across Great Britain. This collaboration has helped UK farmers improve their herd and feed management systems.



In this ‘Farming Tour of Middle Earth’ series of articles, British Dairying turns its attention to one of the most prolific breeding herds in New Zealand’s dairy industry based near Cambridge, as well as focus on LIC’s EU processing centre in the Manawatu region of the North Island.

There are around 7.75 million cattle in Great Britain and farmers are being urged to take on the approach of ‘less is more’ – reducing cow numbers while improving efficiency, sustainability and profitability on-farm.

Genetics provides the key to seeing this goal to fruition. Regardless of farm system, genetics have been shown to

greatly improve on-farm efficiency.

Breeding companies, like Cogent Breeding Limited and LIC, have been working together with farmers for decades to produce better dairy cows – cows that live longer, healthy and productive lives and pass on these traits to the next generation; cows that can better utilise nutrients and feed with less nitrogen and methane outputs; and cows that produce more milk with less liveweight.

Holstein Friesian remains the UK’s most popular dairy breed, comprising 19% of the national herd registrations across all dairy and beef breeds (1.47 million from a total of 2.65 million dairy cows. Source: AHDB).

In the beef market, continental breed Limousin Cross continues its decade-long reign, closely followed by native breed Aberdeen Angus Cross, and continental Charolais. In 2022, 23% of all beef-born registrations were Limousin Cross (down from 28% in 2012), while Aberdeen Angus Cross registrations increased from 10% to 15% in the same period. Birth registrations of native breeds Hereford Cross and Beef Shorthorn Cross are also increasing (Source: ADHB).

Cogent Breeding Limited and LIC UK are fortunate to have access to quality pasture-based genetics that can then be distributed to British farmers across the country. The visiting tour group were able to see what a top breeding herd does to generate high genetic merit bulls and then gain an understanding on what it takes to collect and process straws to the rigorous EU standards.

Payne Farms

The study group had the rare opportunity to visit one of New Zealand’s top production herds – Payne Farms. Run by Brad and Claire Payne, the farm currently supplies more bulls to LIC than to any other breeder.

In 2024, New Zealand’s herd improvement genetic merit national average was 318 BW (Breeding Worth measured across herds of over 100 BW on farms with more than 100 cows) with the top 5% farms recording 395 BW. Payne Farms recorded 456 BW, with three generations of cows on-farm over 700 BW.

Situated on the outskirts of Cambridge

(two hours south of Auckland), Payne Farms is a System 4 farm milking over 600 cows. In contrast to many of their counterparts, Brad and Claire run a long calving process from 1 May to the end of September, aiming for 150 cows calving per month. The reason for this is the farm’s embryo transfer programme, which Brad jokes “started off as a hobby and got a bit out of control.”

In 2024 Payne Farms had 18 different mating programmes in progress and had started a Brown Swiss programme.

It also includes several cows bred with the ‘Slick’ gene – an LIC-discovery that led to a breeding programme producing cows with a short hair coat and improved heat tolerance, both essential for coping with rising summer temperatures.

“We have a long spike to make the embryos, put them in fresh and keep going. We implanted around 800 embryos fresh in 2024. We aim for fresh inserts provided we have the recipients, otherwise we have to freeze. We had a



57% hold rate for our embryos in 2024, which was quite exceptional. Normally this sits at 35%," says Brad.

"Our main focus is on yearlings and getting them to be in-calf in time to calve in May. We milk record every month. Once we've done two milk recordings, LIC will come out and check everything is going well and then we can go from there. Next year is the first year where everything coming in is a result of a contract."

Out on-farm, the group delighted in Brad's ability to rattle off statistics about the cows: "there's '667' over there. She's third generation pedigree there, 740-plus BW and produced over 2780 litres of milk in the first lactation (270kg of milk solids in 129 days). Not sure how many 700-plus BW cows there are in the world. The cow in the middle flicking her tail, that's '667's dam (she produced 6868 litres of milk in 305 days)."



The Paynes' breeding efforts have seen many of their sires become part of LIC's premium bull teams, which are used globally.

Spotlight on LIC's EU processing centre

Five hours south of Paynes Farm sits LIC's EU semen processing facility near Palmerston North. The facility comprises two farms - the Feilding block (190 acres) where bulls are held while awaiting proofs and where LIC runs replacement stock and grazes heifers; and the Awahuri block (330 acres), which is divided into three distinct areas: EU Quarantine (an area used for

pre-quarantine isolation and disease testing), EU Centre (where bulls are farmed for semen collection that is then processed for export), and the Awahuri Hold (where bulls are farmed while awaiting their daughter proofs).

Originally opened in 1960, the facility underwent an extensive overhaul in 2019 with significant laboratory upgrades made for the production of sexed semen. It now produces around 400,000 semen straws for the EU annually.

While the EU Quarantine and EU Centre were off limits to the Cogent Breeding Limited and LIC UK study group (due to rigorous biosecurity restrictions), the farmers were given

a tour of other areas of the farms and taken through the process of selecting the best semen with Farm Manager Louis Weitenberg and European Union Semen Collection Centre and Laboratory Manager Susan Paul.

"We get around 200 new bulls each year and we look after them until they get their daughter proof. Once they get a proof, they'll either head out to quarantine or get transferred to our Newstead, Hamilton centre," says Louis.

"They're big boys - double the weight of many standard bulls. They'll be on the quarantine block for up to four weeks getting weekly testing and scraping. Some days it can be very noisy with all the bulls bellowing at the same time, particularly when we bring them in for disease testing prior to collecting semen for the EU market. They have to be cleared three weeks in a row and assessed by a vet before they are allowed to enter the EU Centre. The testing continues throughout the bull's time here so we can be assured that the semen is disease free."

The centre's season starts in August with milk recording and ramps up between January to March when semen is collected for the EU spring.

Susan says a large part of their role is compliance - for both New Zealand and international authorities.

"We need to assure the New Zealand Ministry for Primary Industries that what we're doing here complies with the requirements for us to ship semen not just to Europe, but also to the rest of the world. We ship straws to Japan, Argentina, South Africa, all over the world. The great news, though, is once the bulls have finished collecting up at Newstead, they come down here. So farmers in the UK and Europe are getting first bite of the cherry among our international markets on these bulls. In 2024 we did seven shipments to Europe - some of those can be over 40,000 doses of semen. Honestly, it's the best quality genetics coming out of New Zealand," she says.

Location of farms



Cogent Breeding Limited is the UK's largest bull stud, specialising in advanced breeding technologies and genetic solutions for the dairy and beef industries. Founded in 1992 and headquartered in Chester, Cheshire, Cogent employs around 200 people. Combined with LIC's expertise in pasture-based dairy genetics and grass-based farming knowledge, this collaboration is able to provide genetic diversity along with exceptional farm management advice and herd improvement programs.

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Higher Greenhead Farm: The Power of Peer Support in Dairy Transformation

From humble beginnings to a thriving autumn block calving system, this family farm's journey showcases how discussion groups can drive profitable change



A Family Legacy Evolves

Higher Greenhead Farm has been in the same family's hands since 1981, when John and Elizabeth Thornber started with just 30 cows and 44 acres, combining farming with a milk round to support their growing family. Over the decades their son Edward took on more responsibility and they expanded to 150 acres with 120 Holstein cows. But despite their hard work, profitability remained challenging.

"Buying milk quota and land never left a lot of profit," Edward explains. Then came what he calls their "light bulb moment" - visiting a local higher end farm successfully grazing crossbred cows with autumn calving.

The Catalyst for Change

The spark for change came from visits to Edward's uncles' farms in Scotland that had successfully implemented paddock grazing and meeting LIC Pasture to Profit Consultant Bess Jowsey at AHDB meetings. Seeing what was achievable from grazing-focused systems prompted Edward to take a fresh look at his own farm's potential.

"We attended a couple of AHDB meetings where Bess was there," Edward recalls. "We saw cows out grazing in early April, and we came home thinking, 'why haven't we got our cows out?' That was it."



The Discussion Group Difference

While the family had considered transitioning to autumn calving before, it was joining LIC's Pasture to Profit (P2P) discussion group that truly accelerated their transformation.

"The positivity from the group gives you the confidence to try, to challenge yourself," Edward says. "There's no time wasters there. They're all very motivated to help and support each other."

Elizabeth adds, "They're like-minded people. Even putting the milking parlour in - somebody from the group said, 'put it the other way round,' it's the best thing we've ever done. It's only through talking."

This peer support proved invaluable, especially considering the significant financial investment required to update their facilities, including a new milking parlour and slurry lagoon.

"In terms of the money we spent on the milking parlour, I don't think we would have invested as a family," Edward admits. "But we saw the honesty of the other autumn calvers in the group and the potential profit we could make, which gave us the confidence to invest in the new setup."

The Transition Journey

The transition to autumn calving was gradual and strategic. They started with a 1st September calving date, then worked to pull the finish a month earlier each year. Now, their calving period runs for 8-9 weeks starting 1st September, with heifers calving at two years.

"Early years, nothing was culled for fertility," Edward explains. "But now, fertility isn't an issue with the cross-breeding."

Bess elaborates: "Initially as you're creating a calving block, there are cows that are on the periphery that are under a lot of pressure to get back in calf very quickly. Not all of them make it. So, you've got to be a little bit ruthless."

Genetics and Continuous Improvement

The farm now utilises a three-way crossbreeding strategy (Montbéliarde x Viking Red x Holstein) and has recently introduced LIC Jersey genetics to enhance milk solids and longevity.

"We've learned that breeding decisions must be data-driven, and LIC's Herd Improvement Tool has been invaluable in helping us select the best cows for the future," Edward explains.

One of the most valuable tools in their breeding programme has been the Herd Improvement Tool, which helped them identify their top-performing cows for their specific system.

"We had data from milk recording, the parlour computer, and the herd software," Edward says. "Putting it all together was a nightmare, but the Herd Improvement Tool showed us simply what were our top performing cows for our system."

The Results: "Output is Vanity, Profit is Sanity"

The transformation has yielded impressive results across multiple fronts:

Health improvements: "I've had one case of mastitis all winter, and that was after a TB test," Edward notes. "We didn't have a milk fever last year. No twisted stomachs. The problems have gone away without pushing the cows."

Edward also highlights that their foot trimmer, once a monthly visitor, now only needs to visit once a year!

Labour efficiency: The new parlour saves them three hours a day, and the seasonal calving pattern means concentrated periods of work followed by more manageable schedules.

Family benefits: At 70 years old, John is still fully involved in the farm but





not doing 100% of the work. “It’s allowed dad to still be involved, but he’s not having to be pushed outside,” Edward says. It also affords Edward more time with his young family.

Grass management: They now use 12-hour paddocks and a platometer to measure weekly, giving them confidence in their grass and silage management.

While milk production is around 7,000 litres per cow - less than they produced with Holsteins - the family is focused on a different metric: “Output is vanity, profit is sanity,” as Edward puts it. Though less milk may be produced, it is with less inputs so overall the farm is making more profit.

The Power of Peer Learning

Perhaps the most valuable aspect of their journey has been the ongoing peer learning through their P2P discussion group. Meeting on the first Thursday of every month at different member farms, the group provides continuous education and support.

“Someone always tells you something that you’ve missed,” Edward says. “Something you’ve maybe walked past for the last five years, and then someone says, ‘why would you do that?’ And then you change it and it’s easier.”

The family credits LIC’s P2P discussion group as the key factor in helping them navigate and implement change successfully. The group provided:

- Benchmarking data to justify investments
- A peer support network that offered practical solutions
- Access to LIC breeding insights, ensuring the best cows are selected for their system

Looking Ahead

Higher Greenhead Farm continues to fine-tune its system, recently trialling LIC genetics on a neighbouring high performing Holstein farm and rearing the calves on his brother’s farm to allow for less competition for pasture at the home farm. Weighing heifers is next on the agenda to push performance further.

For Edward and his family, the transition has been about more than just profitability—it’s about sustainability, efficiency, and enjoying farming again.

“It’s a good work-life balance,” Elizabeth concludes. “It’s very hard from August to January, but now with the cows going out, it’s half the workload.”

“We are happy with our calving pattern now so it’s time for consolidation and to focus on production and profitability,” Edward adds.



Lessons for Others

For farmers considering a similar transition, Edward offers this advice: “Some farmers just aren’t interested. They’ve got their heads down, and if they’re in a comfortable system, why should they change? But for those who are a little bit interested, the advice would be to come and have a look. Because without looking, they don’t know.”

Bess adds that this type of production system particularly benefits smaller family farms:

“Not every business has the scale to employ staff. For the size of this business, a smaller family farm where there’s competition between family life balance and having a nice farming career, that’s where I see

the benefits of this type of production system really working.”

Higher Greenhead Farm shows that you don’t need to have the best facilities to have a profitable farm. “You can make do with a lot less than what other farmers have and still be profitable,” Bess explains, “Sometimes a change in system is easier than finding the capital for infrastructure investments to reach that next level.”



James Simpson
Appointed LIC General Manager for Europe



James Simpson has been appointed General Manager for Europe at LIC, bringing over 30 years of experience in dairy genetics. He joins from Genus ABS, where he most recently served as Business Process Improvement Manager for Europe, the Middle East and Africa.

During his career, James has led retail and distribution markets across Europe, Great Britain, North Africa and Asia.

Emma Blott, LIC GM – Commercial, says: **“James’s experience and insight will be a real asset as we grow our European presence and continue delivering premium genetics and solutions.”**

Based in the UK, James starts on 5 May 2025 and will work closely with LIC’s distributors, Cogent Breeding Services and Eurogene AI Services, as well as continental distributors.

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