Working to **secure your future**

Issue 05 2021

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LIC®
LIVESTOCK IMPROVEMENT

Overtime was introduced to Ireland in Autumn 2020, +69kg solids, his daughters are slightly smaller sized so he ticks all the boxes for farmers looking to reduce size but increase solids.

Exciting sexed semen plans

A massive increase in demand for sexed semen from here in the UK as well as Ireland and France has led Livestock Improvement Corporation (LIC) to consider significant investment and changes to its collection policy.

Working closer with Sexing Technologies at LIC's Awahuri European collection centre in New Zealand (NZ) will be a focus, with the aim of increasing supplies three-fold. Key to this will be the decision to extend from a six-week collection season (in January/ February) to a more full-time processing model which would allow product to be built up throughout the year to cater for the increasing demand for this product. "Unprecedented demand has led us to look at these investment decisions," says Mark Ryder, LIC Europe general manager.

"We take the approach that bulls considered for sexing are picked on their merits to allow our customers to breed from the best available. This philosophy will continue as we aim to give all our customers access to the leading genetics to improve herd profitability.

"Like any major changes to a business model, there is a lot of complexity involved with the new plan and one of the key areas includes juggling the demand from NZ farmers with those from the European market. It also happens that the NZ and European collection sites are a long distance from each other, so logistical planning is also a major consideration.

"There'll always be supply challenges around our desire to offer the very best genetics around the world," explains Mark. "We will only sex our best bulls and the new plans will enable us to offer consistent supply.

"Investment into a purposely built sexing lab at the Awahuri centre is our priority, and working closely with Sexing Technologies, their staff and ours, our aim is to ensure we have a long-term optimal supply model for sexed semen to support our customers' needs here in Europe.

"Included in our sexed offering is The Forwards® bull team, born and bred in Ireland, these bulls are from daughters of outstanding LIC bred Irish cows. This allows LIC to be able to offer our farmers a substantial sexed team with The Forwards® bringing in more diversity to the offering.

"Ordering early does help, of course, but our aim is to build supplies so stock is readily available.

"It'll take a few months for those stocks to be built up, but our new collection months will soon offer us a better long-term solution."

Bull burps could hold answer to climate-friendly cows

The opportunity to breed more climate friendly cows is one step closer for New Zealand dairy farmers after a Waikato trial finds a possible link between a bulls' genetics and the amount of methane they produce.

The pilot trial, by artificial breeding companies LIC and CRV, with funding from the New Zealand Agricultural Greenhouse Gas Research Centre, measured feed intake and methane emissions – in the form of burps – from 20 young bulls destined to father the next generation of New Zealand's dairy cows.

LIC Chief Scientist Richard Spelman says results from the pilot trial are promising.

"Methane production primarily relates to how much an animal eats. We've accounted for this and we're still seeing variation which suggests genetics plays a role in a dairy bull's methane emissions – now we need more data to prove it."

The research will progress to a much larger study where operations have scaled up to collect measurements from 300 young bulls, the full intake from LIC and CRV's Sire Proving Scheme.

"If this genetic link is confirmed, farmers will ultimately be able to breed low methane-emitting cows from low methane-emitting bulls," he adds.

Agriculture Minister Hon Damien O'Connor attended the launch of the project at LIC's farm outside of Hamilton.

"What makes me so excited about this project is the cooperation. A company from the Northern Hemisphere and a company from the Southern Hemisphere working together for a common objective. There are lots of options for methane emission reduction being looked at, and this is a great one," Minister O'Connor said.

"Each one of the cows we have in New Zealand now produces a whole lot more for the same inputs that we put in maybe 20 or 30 years ago. That kind of progressive development that we've seen in production, we want to now see in methane reduction and I'm sure we can do that. We are innovative, we're creative and we're cooperative."

Although methane emissions have been shown to be heritable, Richard says LIC and CRV will carry out additional research to validate their findings.

"We'll be methane testing daughters from the bulls that are identified to be high or low methane emitters to check their emissions are representative of their father's.

It's a long-term project, but it has the potential to deliver real benefits to farmers in the future by providing another tool to reduce their farm emissions," he said.

The welfare of the bulls taking part in the trial is being constantly monitored by LIC, with oversight from the Ruakura Ethics Committee which has approved the project. The bulls have the freedom to move around in their pens; eat, drink and sleep when they wish.

The trial

- The trial is being run by Livestock Improvement Corporation (LIC) and CRV, which together sire 90 per cent of the New Zealand dairy herd through their AI bulls.
- The project has received funding from the New Zealand Agricultural Greenhouse Gas Research Centre (NZAGRC).
- The bulls involved in the trial are housed in a barn so their feed intake can be measured.
- Bulls help themselves to feed throughout the day. They eat Lucerne hay cubes via feed bins which measures how much each bull eats.
- The bulls independently visit the Greenfeed machine (a special methane measuring device).
- They're enticed to visit the machine as they get a small feed of pellets which keeps them in the machine for three to five minutes – enough time to get a methane measurement (ruminant animals burp every 1-2 mins).
- Bulls are under 24/7 video surveillance so scientists can monitor them remotely. It also allows scientists the ability to go back and review footage if they see any odd pieces of data from the machines that need further explanation.

Project timeline

2020
Pilot trial measuring methane from 20 young bulls completed

2021
Main trial commences measuring methane from approx. 300 young bulls (2020 intake of bulls from LIC and CRV's Sire Proving Scheme)

2022
Methane measured from approx. 300 young bulls (2021 intake of bulls from LIC and CRV's Sire Proving Scheme). Offspring from bulls in main trial born.

2023
Methane measured from approx. 300 young bulls (2022 intake of bulls from LIC and CRV's Sire Proving Scheme)

2024
Daughters from bulls in main trial lactating – methane measurements taken from daughters to ensure they're representative of the methane measurements captured in trial and validate heritability e.g. low methane-emitting bulls produce low methane-emitting offspring, high methane-emitting bulls produce high methane-emitting offspring.

2025
Final product! All artificial breeding bulls from LIC and CRV have a methane breeding value, allowing farmers to select bulls who will produce low methane-emitting cows

A day in the life of... John Tobin

LIC's Systems Manager in Ireland

Working across the globe - in Australia, New Zealand and Ireland - gave systems manager John Tobin a great opportunity to learn about grassland management at the same time as identifying the value of grazing cows in different countries.

First working with LIC in New Zealand from 2014 to 2016, John says the experience he gained was invaluable, and that he soon learnt the value of a crossbred cow, noting her efficiency and profitability, and seeing the financial gain she brought to farm businesses.

John was born on a farm in Kilkenny, leaving school at 16 and going straight to Rockwell College in Tipperary where he gained his certificate in agriculture at 17.

He moved back home trying to work on the family farm with his father, but soon realised this wasn't working and joined the farm apprenticeship board for a three year period. Spending time on three different farms, from Kilkenny to Kildare, gave him invaluable experience and, he says, really helped with his personal development.

At 22, he went to Australia for 18 months, working on cropping farms in the outback and on building sites where he gained some great experience in the house building trade – something he would find useful later in life.

Back in Ireland, he went to work on Teagasc farms for the next four years, first based at Kildalton Farm and later at Moorepark. While at Moorepark he did a degree alongside his work, gaining a BSc in Agriculture.

"One evening, towards the end of my course, I was watching a TV programme called 'Ear to the Ground' and there was a feature piece on New Zealand farming," he remembers. "I turned to my wife, Christine, we'd been married just 10

months at that point, and said that was where I'd like to go.

"I never expected her to say 'yes', but she did, and when my course ended on 25 May, we were off to New Zealand, arriving there on 12 June. I didn't even know whether I'd got my degree when we landed!"

After taking jobs on a couple of big dairy farms, John ended up managing 650 pedigree Jerseys for one of the directors of LIC. This gave him an introduction to the Hamilton-based cooperative, and after a year away from the farm, teaching agriculture to High School and Diploma students, he joined LIC for two years as an FSM and breed advisor.

"Then I joined an Agri bank, working for them for two years, and moved on to a nutrition company for a spell. Our second boy was born then so in 2018 we decided it was time to go home, back to Ireland."

While he was in New Zealand he took advantage of a tax free scheme that allowed the family to buy and renovate two houses inside a five year period, so his building skills developed in Australia came into use, and he built up a tidy tax free sum to take home.

In 2019, on his return, he walked into his current job at LIC, and has since taken on responsibility for the exciting IBB programme, The Forwards® bull team, which is growing yearly with the aim of having up to 16 bulls at stud by the end of this year.

"This is a really exciting job," says John. "Last year we sold just a small amount of straws from these bulls as we were just starting out. This year we will top 2500 and I would hope we'll go up to 10,000 straws with increased sales in Ireland, Britain and hopefully into Europe.

Since returning to Ireland, John has got back into the building trade and has built himself a four-bedroom bungalow on an acre plot.

"I project managed the whole job and we're just working on some of the final touches now," he says. Will he sell and move? "No way. My wife says this is it now. No more projects! We're very lucky to live in a great location and any of my spare time I want to spend with the kids in the next 10 years. Henry is 2 and Jack 5, and I love taking them out exploring and going to the beach, which is about an hour away, whatever the weather."

He says he's very settled into his job, loves his day-to-day work talking to, and working with, farmers across Ireland, and wants to slow down a bit so he has time to be 'a proper dad and family man' so no more big projects. The flexibility of the role allows him to take or pick up the children from school and nursery when he can, and he's enjoying seeing things open up again after the shutdown caused by the Covid-19 pandemic.

What does he see as the best part of his role? "The opportunity to talk to very different farmers, no two are the same, and after a couple of years seeing their reaction as they reap the rewards of crossbreeding. By helping them to select the best bulls for their system, I see them producing better, more profitable, cows that will secure their future."

Laughing he says the worst part of the job can be the driving. He hasn't travelled so much in the past year, but now he's back on the road, and he knows that delivery times in the spring can bring long hours and logistical challenges.

"My aim is to help farmers to breed more efficient grass-based animals. There are huge opportunities here and it's so rewarding to see my recommendations working."

Away from life at LIC, John enjoys a night out with live music or a show and is pleased to see these events beginning to happen again.

He lives in Woodsgift, Co Kilkenny, about half an hour from the Eurogene office, but says he's ideally situated to move around the country as he's just 20 minutes from three major road routes.

He's also a committee member of his local hurling club and says he's partial to a pint or two at the local on a Sunday.

"I'm incredibly lucky," he says. "I love my job, have a lovely home, wife and children, and get immense satisfaction from seeing my work pay dividends."

Environmental and Production Efficiencies are key to success

Joyce Voogt, International Technical Manager for LIC, sums up why both are such important targets on your dairy farm

> Breeding more efficient animals helps dairy farmers globally unlock both profitability and environmental gains.

Summary:

- **High genetic merit cows partition more of their feed intake to milk production, and lose less to the environment as nitrogen and methane per kilogram of milk produced.**
- **Kilograms of milksolids per kilogram of liveweight is a good proxy measure for production efficiency.**
- **High genetic fertility heifers calve down younger and re-calve sooner than their low fertility herd mates.**
- **Long-lived cows contribute for more lactations in the herd, diluting their rearing costs through greater lifetime milk and progeny income and lower replacement heifer requirements.**

While pressure is mounting on food producers to demonstrate their environmental credentials, economic reality dictates that farmers must at the same time, be consistently profitable.

References:

1. https://ahdb.org.uk/estimated-milk-production-costs
2. Feed Use in the NZ Dairy industry, MPI Technical Paper 2017/53
3. Facts and Figures, Chapter 4, DairyNZ
4. https://landly.com.au/projects

Production efficiency:

Feed efficiency is a key component of on-farm efficiency, and animal feed conversion efficiency (FCE) plays an important role in this. Feed and forage costs are significant and in 2020 accounted for 43% of the cash cost of production in autumn-block and all-year-round calving herds, and 29% of cash costs in spring-block calving herds[1].

One measure of FCE is the calculation of kilograms of milk solids as a percentage of liveweight[2], with ≥100% being the 'glittering target'. A highly efficient cow will, kilo for kilo, exceed her liveweight in milksolids production. Some Irish farmers already achieve in excess of this across their herd, a feat that is more achievable with moderate sized cows.

Heavier animals use a greater proportion of feed eaten for growth and maintenance, and a lower proportion for milk production. A 50 kg heavier cow will require 200 kg DM more feed annually just for maintenance and will have used 374 kg DM more feed* for growth from 3 to 22 months of age[3].

This means lighter cows can be more feed-efficient in terms of milk output per kg of dry matter eaten, hence the focus on optimising the size and efficiency of LIC-bred dairy animals.

Phenotypic feed efficiency is increasing at 1% per year, at a national level in New Zealand cows. Two thirds of the gain is attributed to a better feeding environment and one-third to genetic gain. See Figure 1.

Over the last 10 years, the average annual rate of genetic gain in New Zealand Friesian cows saw gains in liveweight matched by gains in milksolids, kilo for kilo.

* at 11 MJME/kgDM

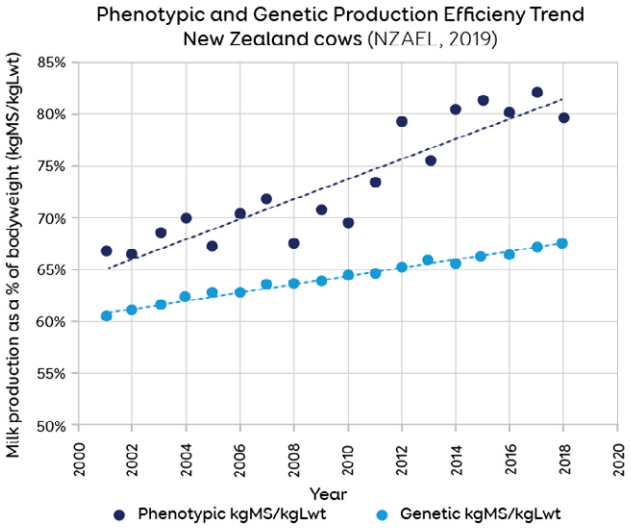

Figure 1: Production efficiency gains over time, New Zealand cows

Environmental efficiency:

Improved production efficiency comes with environmental benefits too. In the last 30 years, genetic gain in the New Zealand herd has delivered a 16% reduction in urinary nitrogen and 13% reduction in methane outputs per kg of milksolids.

The current annual rate of genetic gain, ($10BW points/year), can achieve 2g less methane and 1.7g less urinary nitrogen per kg milksolids, as environmental efficiency increases.

Figure 2 shows the relationship between methane efficiency/ kgMS ranking and feed partitioning. The highest-ranking animals, (HoofPrint rating 10), apportion less feed to growth and maintenance and more to production.

For dairy cows, three key influences stand out for environmental efficiency: liveweight, productivity and longevity.

Higher ranking animals are, on average, smaller and higher producing, directing a greater proportion of their feed to milk production.

Longevity modelling suggests that increasing the herd average number of lactations from four to five can reduce urinary nitrogen by 5.2% and methane by 4.5%/kgMS through lower replacement rates and higher lifetime production efficiency. Fertile cows are essential to this.

Genetic trends for LIC bulls are strongly positive across all these important traits, as the breeding programme delivers sires that will meet future global farmer needs – that is, cows that increase profit and reduce the environmental impact to deliver a more sustainable future.

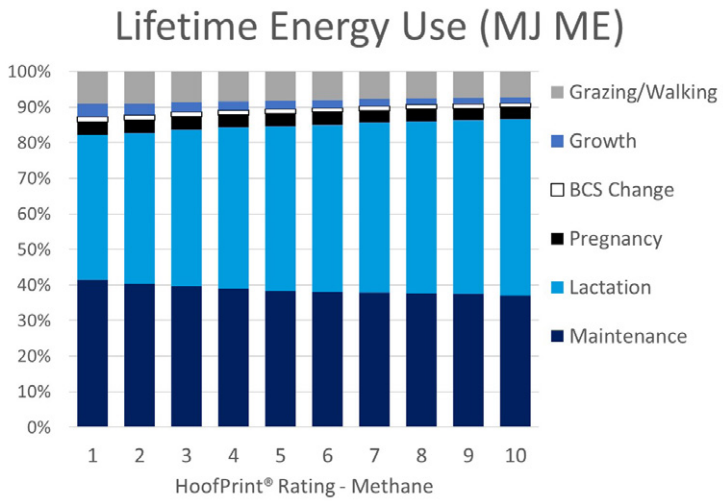

Figure 2: Lifetime Energy partitioning by methane efficiency ranking (LIC, 2020)

The 10 steps

A recent project from Australian dairy industry body, Dairy Tas, 'The 10 Steps', has identified ways for Tasmanian dairy farmers to reduce their carbon footprint.

Central to the findings was the need to breed a cow which produces high milksolids relative to its liveweight, while lasting longer in the herd. The project suggested a milksolids target of 90 to 100 per cent of liveweight.

Rachel Brown[4], a Tasmanian environmental consultant who worked on the project, said genetics was an obvious starting point for the investigation, as cattle produce 60 to 65 per cent of the emissions from the state's dairy industry.

"This project showed you can milk less cows, but milk better cows," she said.

"With the right animals you can focus on profitability, not production. With the right cows and the right genetics, it flows through the whole business, and you can have good people, who run the farm well."

Read more about the 10 Steps on Dairy Australia's DairyTas website at www.dairyaustralia.com.au/dairytas-10steps

The role crossbreds play on a Co.Laois farm

Jonathan Dwyer is a big fan of crossbred cows his milk solids and stocking rates of these easycare cows are crucial to meeting the KPI's of his business.

Jonathan Dwyer

He runs 520 cows on a 164ha milking platform at Muine Mor Farm, Borris in Ossory, and also has 100ha of rented ground close by where they rear youngstock and heifers.

Both his parents, Jim and Grainne, started with LIC genetics in the early 1990s through the late Peter Daly and says his was one of the first Irish herds to move to NZ genetics. They use the best bulls available, looking for fertility first, followed by milk solids, capacity, longevity, SCC and udders.

"We continuously review what we're doing," Jonathan says. "We can't afford to stand still. This is still quite a young herd, and we've expanded quite quickly, so there's a lot more to come."

His aim is to move all the herd towards a 50:50 Jersey X Friesian, and his belief is the longer he can keep his cows in the herd, the more milk she will give. "Days in milk are vital."

The Dwyer's were lucky to get some extra ground in 2019 and that's allowed them to increase from 300 cows up to the 520 milked today. They bought some in-calf heifers in and bred as many replacements as they could to reach those numbers.

In the past two years he's used the Jersey bulls Misty, Dexter, Hoss, Quicksilver, Gallivant and JJS, and the crossbreds ZSP, Just Once Cooper, How, APY, Pacemaker and Revenge.

Selling to Glanbia, he gets paid a premium for butterfat and protein, and with the age of his herd he is delighted to be getting 5.16% butterfat and 3.97% protein. "The figures are steadily increasing and while I'm at around 400kgs milk solids from an average cow weight of 480kgs, I am hoping to get to 450kgs this year with an average lactation of 2.7."

"I feed very little concentrates with the bulk of the milk coming from forage," he says. "Last year we fed around 400kgs/head, this year we will be closer to 500kgs/head. Weather and grazing conditions play a large part in how much we feed."

Magic day came later this year, and his normal plan is to have the cows out as soon as they calve - that means late January or early February. They come in full-time in mid-November, so his grazing season is between nine and 10 months long.

All the land is down to grass, on a paddock grazing system, with between 24hr and 36hr grazing breaks per paddock, each around 8ha in size and all electric fenced. The area doesn't really produce winter grass so he says getting his covers right in the autumn is really important.

Last year his grass yield was 13.8 tonnes with a utilisation rate of 12.6 tonnes, or 91%. "Anywhere above 85% and above and you're doing really well," he says.

Along with John Keane, the chair of Macra na Feirme, Jonathan set up the 'Make the Moove' initiative that focuses on farmers mental health. His county has the highest suicide rate in Ireland, and particularly during the height of the Covid pandemic, saw many of his fellow farmers and rural workers struggling.

Jonathan travelled to NZ in 2018 and reached out to Rural Support Trust to gain an insight into how they got set up and the overall running of the Trust. The key learnings were that: it had to be farmer led and driven, had to be independent from any private entity and it had to have a rural focus.

"This is still in its infancy, and there's a lot of work to do," he says. "People often don't see the struggles farmers face - with extreme weather, isolation, a lack of financial knowledge, family or relationship issues for example.

"There's a significant level of research that is available and ongoing in mental health among farmers. We're also working with Irish bodies who offer services to try and come together to work on tailoring their programmes for farmers and rural people."

The long-term goal of the programme is to have a complete rural support service for farmers and rural people alike. The programme wants to be associated with positive mental health among farmers and rural people across the country. "To achieve our ambition, it is important that the programme is appropriately funded and resourced," he says. "This programme begun with farmers talking to farmers and remains centred around the core belief that farmers and rural people be allowed to design solutions for their own needs."

Moving back to the farm, spring 2021 was the first time that AI was used across all the cows, with the heifers getting one round of AI and then being mopped up by stock bulls. The heifers are calved 10 days before the cows because they take on average 10 days longer to come back cycling. This gives first calvers the best chance to stay in the herd; "Out of 260

1st calvers last year, eight were empty," he says. Calving is kept to a very tight pattern, with April 14 the complete cut off, with an aim to have all calves born within a 9-10 week period. His aim is to tighten this further.

In 2022 the plan is for all the heifers, and top cows, to have sexed semen for the first time, with the rest of the cows put to a beef bull - Hereford, Angus or Speckled Park. All are easy-calving which, with the numbers involved, he sees as a crucial trait.

All calves are genotyped at birth, and the aim is to keep 195 heifers, while the rest are all sold in batches to local farmers. First service conception rate was 70% last year with just a 5.5% empty rate after 11 weeks of breeding.

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2020 Stats	
Herd Size	500
Milking Platform	164Ha
Outfarm	100Ha
KgMS/cow	421
Fat/Protein %	5.14/3.96
Cow Liveweight	450kg
Concentrates per Cow	400kg
Mating length	9wks
Empty rate	5.5%
6 week calving rate	91%
Calving interval	366 days

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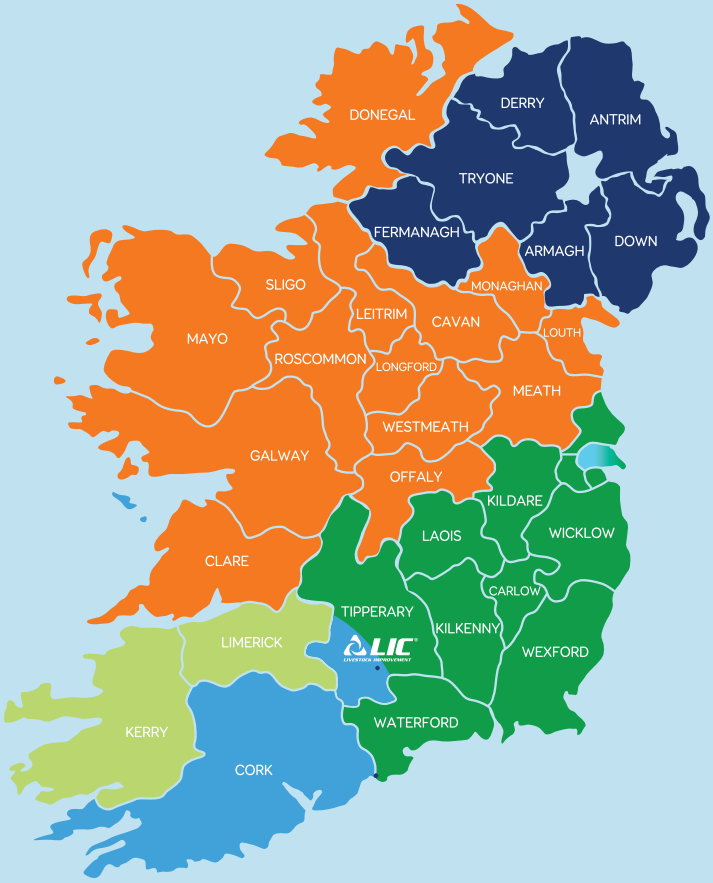

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