- THE GENIMEX JOURNAL -

MILK & HONEY

EDITION 19 I MAY 2024

FEED EFFICIENCY
The key to sustainable dairy success

CARBON FOOTPRINT
Hanna Driscoll gives pointers to reducing your herds carbon footprint

THE SLICK GENE
Breeding heat tolerant dairy cows

KIWICROSS™
Insight into the history of the KiwiCross™ breeding programme at LIC

SA DAIRY 2020
We provide some take-home points from the presentations

SA DAIRY 2020
Highlights of the SA Dairy 2020 meetings of 2023

Genimex agents visit LIC

- MANAGEMENT -

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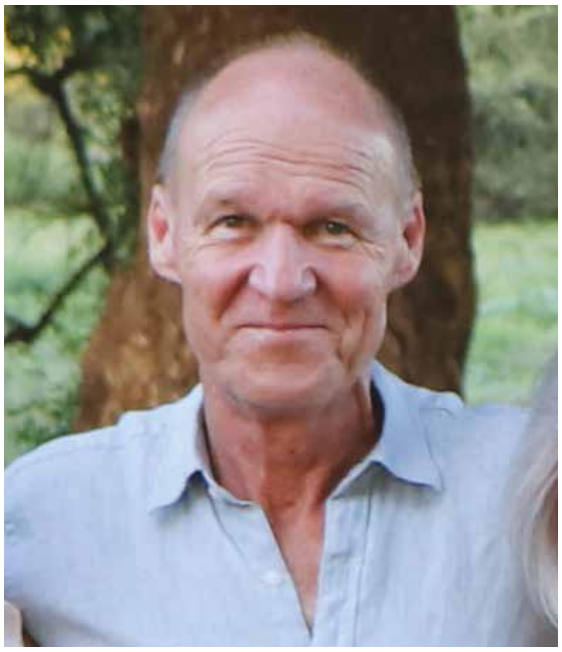


Foreword

BY CHRIS CLOETE

It is indeed a pleasure and a privilege to be involved in a part of an industry that bases its daily discussions and actions on the positives. In the livestock breeding industry we are continually talking about better, profit, improvement, efficiency, success, and a better future.

We at Genimex, together with our two suppliers, stand for BREED IMPROVEMENT. We go about our daily lives trying to make things better for our clients, we want our clients to have better cows, that are more profitable, fertile and efficient. We celebrate with a client when they use less semen to get cows in calf.

One negative in the dairy livestock breeding industry, which I have written about so many times, is the dairy farmer that believes it is OK to buy on price alone. The semen agent ties him/her down to taking whatever bulls he has in his flask that day, regardless of their genetic value or if they fit a breeding plan, or not. These clients generally do not have a plan and it is all about "getting cows in calf" as the bull does not matter. I have news for them, the bull does matter and there would not be a multimillion-dollar industry involved in Genetic improvement if breeding better and more efficient cows was not possible. There are of course consultants that advocate using cheap semen to "just get the cows in calf" in order to look good on the short term budget. They conveniently forget about the long term damage to the profitability of the herd.

To continue on my thoughts of the livestock breeding industry being such a positive space, I have, in this the 19th edition of M&H, featured the persons in charge of our two suppliers. Louise Helmer of VIKINGGENETICS and David Chin of LIVESTOCK IMPROVEMENT CORPORATION NZ. From their articles you will note it is all positive and about making a better future, for people, livestock and the environment.

David was a key speaker at the Dairy 2020 workshops we hosted last year and I have included summaries of his presentations in this edition of M&H.

Louise has not been to SA yet but she is scheduled to visit us in June this year. I, together with the rest of the Genimex staff, really look forward to welcoming her and showing her some herds that have so successfully used the genetics from VikingGenetics. This edition of M&H is filled with the "Positives" of breeding great dairy cattle.

Hanna Driscoll of VikingGenetics writes about matters that are very much on their radar, efficiency and carbon. Then, there is a really exciting development around breeding heat tolerant dairy cows. LIC determined the position of the SLICK gene on the genome and is now taking it the next step. See the article by Gemma Worth of LIC.

What would an edition of M&H be without the assistance of Dr Joyce Voogt of LIC who is always so willing to help source and edit articles to publish. Once again, our very own Johan Müller writes about a visit by Peter Larson of VikingGenetics and the success stories in the Cape. Thank you, Johan.

"Tempus Fugit" Yes, we are all under pressure to have time to do what needs to be down. I however felt that time needs to be made to take the Genimex sales staff to visit our suppliers. It was time to talk face to face and see first hand what is going on in New Zealand. A very big thank you to all at LIC that made the visit a resounding success. The trip to LIC took place in March 2024 and I have included some photos of the trip in this edition of M&H.

The trip to VikingGenetics is scheduled for October 2024 which is certainly worth the wait and we are all looking forward to it.

As I have said, it is all about positives and progress. Use the right sires, use them widely and you will make small but cumulative improvements year after year.

We have just been through a period where getting semen into the country has been a challenge due to delays in the issuing of import permits. Genimex has come through rather well with not only having enough semen available for this Autumn season, but also having the right semen available. We are already lining up our shipments for Spring. We thank our clients that work with us in getting their orders in on good time, it just helps us plan.

It is our unwritten brief to supply the right sires at the right time in the numbers that are required to enable our clients to breed better cows. LIVESTOCK IMPROVEMENT.

I hope and trust that you enjoy this the 19th edition of the Milk & Honey and you find value in it for your business.

Chris Cloete

Jan de Jong

SA DAIRY 2020 MEETINGS 2023

Dr Jane Kay is a Principle Scientist for DairyNZ, and as such, it is obvious from her presentations that this position covers a broad range of subjects, all benefitting the NZ dairy farmers. While some subjects may at this stage seem theoretical, most can easily and quickly become of importance due to the way in which politics is moving.

Interesting that South Africa has, as far as I can remember in the days of the Dairy Board, never had a scientific researcher (but there was an Agricultural Economist) which means that there was no farmer funded applicable and direct industry research for South African dairy farmers. The government and commercial companies did research on behalf of the industry. How practical this was can be questioned. Researchers did it to try to get papers published, and companies did it to sell dairy meal. There is at least one excellent researcher still doing pasture research in the South Western Cape. How many others we have in this country is unknown.

Dr Jane Kay, Principle Scientist at Dairy NZ

We are thankful that, with a small degree of tweaking, many of the points raised by Jane could be applied here today in SA.

In an agricultural scenario the efficient production of a commodity is impractical without sustainability, combined with acceptable production techniques. A major part of sustainability is profitability and the ability to try to be more efficient than the chap next door in order to hopefully buy his farm to increase the size of your operation, thereby increasing your scale of production (economies of scale) and building a more resilient business. Linked to the competitivity and resilience which one needs for success is being able to accommodate change.

Profitability measures depend on the production system that you use - for example, in a Total Mixed Ration (TMR) scenario efficiency measures may be production per kg ration fed, margin over feed costs or suchlike, whereas in a pasture based system efficiency measure is kilogram milk solids/ha (kg/MS/ha).

Research in NZ shows that the increased margin of NZ$300.00 per ha of the top 25% of dairy farmers is due to better utilisation of pasture – how much more forage was utilised compared to other farmers. Increased utilisation is a factor of planned date of calving (having forage available when required), when cattle dry off (not having excess forage after that date), early removal of cull cows, stocking rate and how excess forage is stored (no wastage).

In other words, control of quality, supply and demand of forage, coupled with tight cost control were also seen as factors of profitability. It was shown that tight cost control trumped production for profit.

This was proven by the fact that for every $1.00 spent on "imported feed" (in SA we refer to purchased feed) expenses were between $1.53 and 1.68 higher. This means that return on imported feed has to be over $2.53 to $2.68 more than no supplementary feeding to be financially feasible.

Further research showed that additional feeding could increase marginal costs by up to $5.36/kg MS and $6.66/kg MS for Palm Kernel supplement and other supplements respectively for MS/ha production increases of 22.9% and 30.3%.

Work by Ma et al. (2017) also showed that moving from a lower input system to a higher input system significantly increases milk solids and revenue, but this movement had no significant impact on operating profit.

All the New Zealand dairy success could not have occurred without an adapted production unit. Cross breeding research started in 1972 at Ruakura, possibly the beginning of the KiwiCross™ breed? The project showed that the suitable cow for the NZ system was different from that of other countries – it must be mobile, able to graze pasture, and get into calf within 80 days of calving.

Further requirements have emerged over time: the animal had to be an efficient producer of high solids milk, fertile and be long lived. Longevity will only be achieved if the animal is able to fit into the production system. It is a complement to the original researchers that the cow that has emerged today had at least two of the original characteristics: mobility and fertility.

With changes we see occurring worldwide today, further pressure to adapt will be equired, along with the ability to decrease methane (CH_4) production as a way of satisfying those zealots riding the Green House Gasses (GHG) and global warming scenarios. Further discussion regarding the NZ approach will be briefly covered later.

Labour problems have long beset the New Zealand industry, as with many dairy producing enterprises worldwide. There is probably no other agriculturally related enterprise with such anti-social hours, and the inability to attract young entrants.

The newest research is more flexible milking hours - less milkings.

Efficiency at farm level is a combination of different factors, of which leadership, actual on the job experience (and mastery of the task), autonomy and reliability are some. This is a place where the ability of management at all levels in New Zealand dairy farming operations has proven positive, and structured training systems are in place at farm level. Leadership and actual knowledge of mundane tasks enables management to teach new recruits, while also being able to add value in case of mistakes. The New Zealand system of share milking is a method of attracting and keeping highly motivated entrants in the industry, something that is lacking in South Africa. With the difference in persona milking on most South African farms and our poor levels of training it is hardly surprising that knowledge, motivation and reliability are considered problematic. Part of the problem could probably be laid at the feet of some South African dairy managers, how many have actually been in the pit for an extended period of time?

Due to the shortfall of 4,000 dairy workers in NZ (and this figure is only on farm milkers, not tractor drivers, fencers etc.), there is ongoing research being conducted to find more sociable work hours (and decrease work hours), make the job easier and safer through the use of technology. The aim is to attract and` keep skilled people in the industry. Automated milking systems (robots), automated cluster removal and teat spraying and automated gates have no doubt decreased labour required, but time at work is still a factor.

Systems being tested are once a day (OAD), 3 in 2 (3 milkings in 2 days) and 10 in 7 (10 milkings in 7 days).

Effects of this timing on yield (20% decrease, 5% decrease and 29% decrease respectively) are offset by better body condition scores (BCS), overall better animal health, reduced lameness, and better staff wellbeing due to flexible hours and reduced working hours. Cows also settle quickly into a new routine, which may be introduced at any part of the lactation.

Further points discussed were the Environmental Footprint and wearables, or data transponders.

While environmental research is not big in South Africa, applied research in other countries means it is possible for us leverage off applied research as most research is scalable. Why exactly New Zealand, Ireland and the United Kingdom are at the forefront of Carbon Footprint implementation when the US, Russia and China seem indifferent to the problem is baffling. On top of this, NZ is in the process of levying Green House Gas taxes on farmers (these are being abetted by large international dairy companies like Nestlé) in addition to the misguided sale of carbon credits – this is chiefly in the form of purchasing currently productive dairy farms and planting pine trees. End result of this strategy are large belts of sterile homogenous forests with no degree of differing ecosystems (homogeneous forests replacing multi species pasture, natural grazing and scrubland), and simultaneously decreasing food security, work opportunities and financial wellbeing in local towns and villages.

It is these government policies that are driving the industry to conduct CH_4 related research on heritability of CH_4 production, variability between high and low methane producing bulls and low methane producing cows.

South Africa's current problem are the envisaged changes to the Water Act: the purpose of the amendments is to effect "reforms in relation to equitable allocation of water use, as well as to amend the procedural requirements related to applications of new water use licenses including reviewing of timeframes and fees linked to license application". I foresee that this can only mean access to water rights will be skewed towards those who have access to officials and cadres. Investment in water infrastructure will decrease, finance from financial institutions will be more difficult to obtain, and food security may ultimately suffer.

The New Zealand government has become one of the most progressive (and I use the word advisably) in terms of GHG and its way of dealing with Methane (Ch_4) from livestock emissions, but this is largely at the expense of agriculture, as agriculture is traditionally a "soft touch". Technology has allowed easier data capture methods to monitor cow activity (for oestrus), rumination, grazing time and heat stress by the attaching of "wearables" (collars, on legs, ear tags or boluses). The downside is how a farmer uses this plethora of data, and the question of value adding occurs. This investment could often be more profitably applied by investing in infrastructure to alleviate the negative results of the data. For example, if heat stress is a factor, additional access to water resources may be a cheaper option. A positive cost / benefit outcome must be established.

Jane Kay's talks were wide ranging and covered advances in New Zealand thinking. This is not to say that these matters will not affect South African farmers at some time. It only takes a person (or more likely, a group of people) to think of a populist matter and a small but vociferous "green" or "woke" group can really make a farmer's life a misery relatively quickly. It means that Agriculture will need to develop methods to understand how to deal with unenlightened, impractical, vociferous and illogical persons who believe that their ways alone can feed the world.

REPRODUCTION MANAGEMENT

Pete Wichman presents at the SA Dairy 2020 meetings 2023

THE PLAN

The Set Up

Targets by 1 June

Grass

Target covers

2,300 kgDM/ha

Cow Condition

4.2 (~2.8 in SA) Body Condition Score

Dry Off

- Cows are dried off due to **grass growth rates** (not to cow condition)
- First 7 days - dry cows are given **7kg** DM/cow to shut the udder down
- From then cows are given **13kg** DM/cow for 70 days (to start of calving)
- Cows should go from 4.2 to **5 BSC** during this time.

Calving

- 10 days before calving, dry mobs are broken into springer mobs
- Springer mobs given **10kg** DM/cow until they calve
- **10kg** DM/cow are given in the colostrum mob
- **15kg** DM/cow is the start of the spring rotation planner for milkers
- Feed is increased to **18kg** DM/cow when grass growth hits **50kg** DM/ha and NOT before (~10 Sept)

Artificial Breeding

- No CIDRs
- No Metricheck
- No intervention

Tail paint applied 1 day before AB starts (12th of October)

Blue = non mated cows

Red = mated cows

Heat detection training is done on the first day of mating

- Done behind the backing gate

AB goes for 4 weeks 5 days

Pete Wichman (Contract Milker at the Armer Group) and AB Technician for LIC inseminating 4000 cows in the AB season, during his presentation at the SA Dairy 2020 meeting.

Heifer Management

Whole herd is milked TAD until 20th September

20th Sept they are split into 2 herds:

1) Heifer mob and young cows

2) Older cows

- **Heifer mob** are milked OAD from 21st of September (3 weeks before the planned start of mating) and milked OAD for the rest of the season.

Bull Management

Bulls are put out with the cows after AB

17 bulls per 500 cows

Bulls come out of the herd on 21st of December

Pregnancy Checking

All cows that are mated up to 1 December are PD on 12 January (42 days),

- We expect to have 84% of PD cows in calf
- 16% rechecks (can't determine if cow is in calf or not)

NOTE: the 16% rechecks can be culled depending on grass growth (22% 2yr old heifers coming into the herd to replace them)

28 days later, rechecks are PD. We expect 6% of this group to be incalf, 10% not in calf.

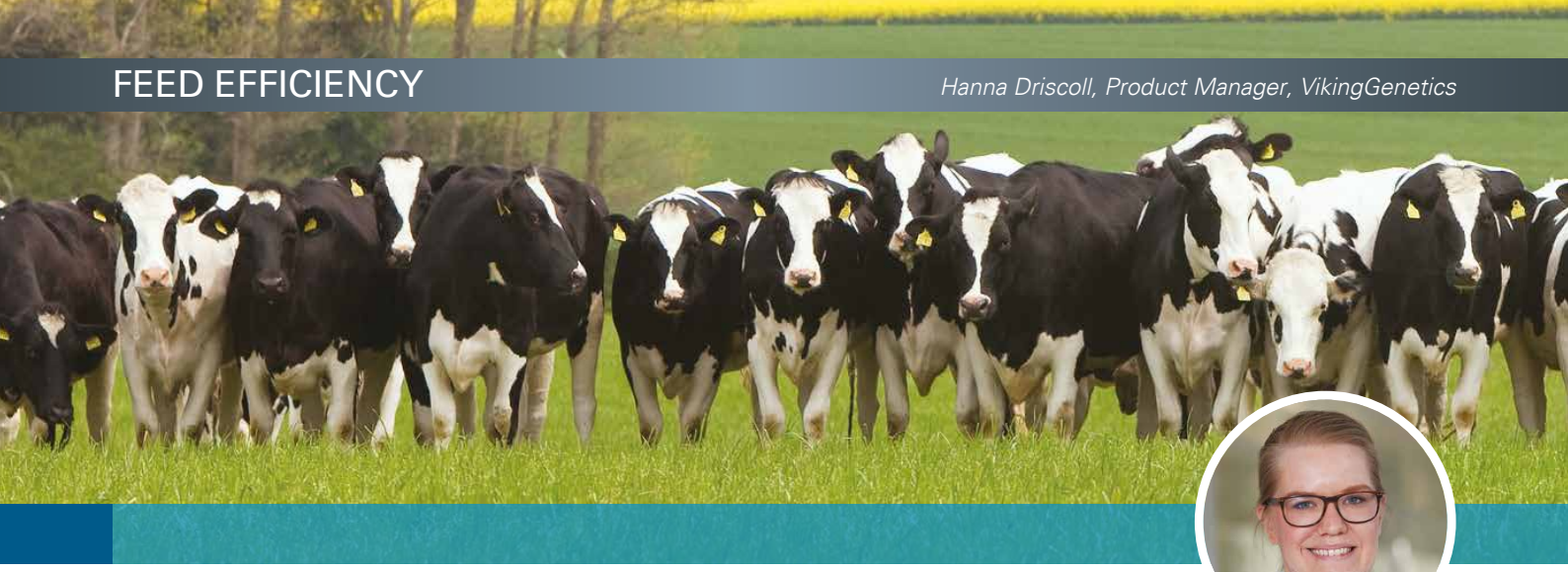
Culls leave the farm 1 day after rechecks to fit into the works schedule (1,500 cows)

OVERVIEW

- 4 weeks + 5 days AB
- 5 weeks with the bull
- 17 bulls per 500 cows
- No rotation of bulls

7.5% - 10% empty rate

Hanna Driscoll, Product Manager, VikingGenetics



FEED EFFICIENCY:
the key to sustainable dairy success

VIKINGGENETICS innovative breeding

The world has put dairy farmers and their cows under a magnifying glass. Public scrutiny of food production's environmental footprint has never been more intense. Finding ways to maximise farm returns while reducing emissions is more important than ever.

Identifying your most efficient feed-converting cows plays a vital role in sustainability by reducing farm waste and ensuring **maximum farm returns**.

Using the **Saved Feed Index**, you can breed more feed-efficient and climate-friendly cows, all while achieving high production and maintaining good health and reproductive performance.

The Saved Feed Index is based on data collected by the **Cattle Feed Intake System (CFIT)**. This advanced AI-based system uses **recycled 3D cameras** and **deep learning** to monitor and measure feed intake in a cow's natural environment during lactation.

With **highly reliable feed-efficiency data**, you can make well-informed decisions that **enhance feed efficiency**, reduce costs, **lower emissions**, and simplify your daily tasks on a farm.

IDENTIFY THE TOP PERFORMERS IN YOUR HERD

The data reveals a significant difference in the level of profitability among the individual cows in the herd. The best-performing cows have a **3-4 times higher contribution margin (CM)** than the worst-performing cows within the same herd. Data from 11 CFIT herds in Denmark shows that, on average, the difference between low and high-efficiency cows is **18,400 €** per year.

Caeli Richardson PhD, Plant and Animal Geneticist at AbacusBio, also vouches for the system's benefits after seeing it in action during a visit to Denmark.

"Having **individual feed and weight measurements** on commercial cows allows our industry to enter a new level of precision farming," she says, highlighting the advancements enabled by the CFIT system. "Looking at the results from just those 11 herds really shows us that we are missing out on profit if we ignore selection for feed efficiency," she adds.

#	Feed, kg DMI	Kg ECM milk / cow / year	Kg Methane / cow / year*	Kg Methane per kg ECM milk / cow / year	Average Contribution margin (CM) / cow / year, €	Lowest CM / cow / year, €	Highest CM / cow / year, €	Best- vs. worst-performing cow – times difference
1	7,794	11,776	155	0.0132	€ 2,307	€ 1,044	€ 3,263	3.1
2	7,979	10,674	159	0.0149	€ 1,913	€ 862	€ 3,317	3.8
3	7,391	10,699	147	0.0137	€ 2,036	€ 1,046	€ 3,555	3.4
4	7,571	11,004	151	0.0137	€ 2,100	€ 919	€ 3,195	3.5
5	7,518	11,017	150	0.0136	€ 2,114	€ 831	€ 3,565	4.3
6	8,214	10,665	163	0.0153	€ 1,864	€ 809	€ 3,272	4.0
7	7,543	9,543	150	0.0157	€ 1,631	€ 830	€ 2,639	3.2
8	7,807	12,240	155	0.0127	€ 2,456	€ 1,102	€ 3,515	3.2
9	8,420	13,189	167	0.0127	€ 2,645	€ 1,141	€ 3,634	3.2
10	8,257	12,062	164	0.0136	€ 2,310	€ 953	€ 3,347	3.5
11	8,374	13,437	167	0.0124	€ 2,734	€ 1,119	€ 3,655	3.3

Hanna Driscoll, Product Manager, VikingGenetics

BENEFITS FOR THE ENVIRONMENT

Research into greenhouse gases indicates that, on average, **6%** of the energy that a cow eats is spent on producing methane. However, this varies from **2-12%** depending on how feed-efficient the cow is.

Data from the 11 herds also show a significant difference in **methane emissions**. The best-performing herd has **26% lower emissions per kg ECM milk produced** than the worst-performing herd.

Methane production (calculated based on the model used for reporting climate impact to the United Nations' Climate Panel) ranges from 147 to 167 kg of methane per cow annually across the herds.

DATA THROUGHOUT THE FULL LACTATION

A cow's physiology changes dramatically through lactation. In the **early stage of lactation**, cows transition from not producing milk to a potentially high milk yield. This phase is particularly unstable for the cow.

It is especially important to have extended data for cows' weight and feed intake for early lactation, as cows are more susceptible to diseases during this period.

CFIT data provide insights into the **weight change** during the first seven weeks of lactation. The table shows the breed averages for weight loss by parity for Holstein, Jersey, and Red Dairy Cattle.

Weight change during the first seven weeks of lactation

Breed	1st lact.	2nd lact.	3rd lact.
Holstein	-12 kg	-12 kg	-15 kg
Jersey	-13 kg	-12 kg	-17 kg
Red Dairy Cattle	-11 kg	-17 kg	-24 kg

Ensuring adequate energy in the feed ration **prevents excessive weight loss** and promotes improvements in production levels and the overall health of cows.

As lactation progresses into the mid and late stages, the cow becomes accustomed to **high milk production and the corresponding feed intake**.

"Previous studies indicate that feed intake differs between early, mid, and late lactation," says Jan Lassen, Project Manager at VikingGenetics. "Merely having data from mid-lactation would lead to a situation where feed efficiency is compromised rather than improved," he adds.

To create a reliable Saved Feed Index, it is essential to have data available throughout the entire lactation. The data obtained from CFIT farms provide valuable information spanning the full length of each lactation.

BREED FOR MORE FEED-EFFICIENT AND CLIMATE-FRIENDLY COWS

With the Saved feed index, you can **breed for more feed-efficient and climate-friendly cows** – without compromising on the production, health and reproduction performance of your cows.

For the Saved feed index, the daughters of two bulls with a difference of **20 index units** will have a difference in dry matter intake (DMI) of **70-100 kg per lactation**.

EBV 120 means reduction in feed consumption – kg DMI per year.

	Viking Holstein	VikingRed	Viking Jersey
100 cows	16,400	19,600	13,400
200 cows	32,800	39,200	26,800
500 cows	82,000	98,000	67,000
1,000 cows	164,000	196,000	134,000

MORE DATA, MORE FEED-EFFICIENT COWS

Currently, the CFIT system is installed across **25 commercial herds**, which collects data from over **14,000 cows**, including VikingHolstein, VikingJersey, and VikingRed.

The amount of feed intake data is consistently growing. The goal is to have feed intake data for **30,000 cows by 2025** for the three major dairy breeds – **Holstein**, **Jersey**, and **Red Dairy Cattle**.

VikingGenetics leads the way with a Saved Feed Index as the **only company in the world** to offer a feed efficiency index for Jersey cows and Red Dairy Cattle.

Dairy farmers across the Nordic countries and over 50 markets where VikingGenetics operates are already reaping the benefits of **breeding for improved feed efficiency**.

DAVID CHIN

CEO

Livestock Improvement Corporation (LIC)

In the realm of agricultural innovation, one name stands out: Livestock Improvement Corporation (LIC) of New Zealand. At the helm of LIC is David Chin who took on the role of CEO in 2022 and brings with him a wealth of industry knowledge - as can be seen from the roles that he has fulfilled during his time at LIC. With his strong communication skills and experience, he is well suited to lead LIC into the future to provide solutions for the challenges facing the dairy industry.

THE CHIEF EXECUTIVE OFFICER: 2022 – PRESENT

PIONEERING BIOSECURITY EXCELLENCE: GENERAL MANAGER, OPERATIONS AND SERVICE (2018 - 2022)

During his tenure as General Manager, Operations and Service, David led LIC's response to the biosecurity challenge of a M.bovis outbreak in New Zealand. This led to the successful implementation of LIC's M.bovis biosecurity programme, which not only safeguarded the livestock industry, but also earned LIC the prestigious Biosecurity NZ Industry Award in 2019. This award underscored LIC's unwavering commitment to protecting the health and wellbeing of New Zealand's dairy sector.

DRIVING CULTURAL TRANSFORMATION: CHIEF TRANSFORMATION OFFICER (2016 - 2018)

As Chief Transformation Officer, David orchestrated a shift within LIC, delivering $45 million of incremental cash within the first 12 months. More than just financial gains - David catalysed a cultural transformation resulting in a significant improvement in LIC's Organizational Health Index score - putting LIC in the top quartile of businesses worldwide.

INNOVATING SALES STRATEGIES: TERRITORY MANAGER (2014 – 2016)

In his role as Territory Manager, David implemented a Solutions Selling framework. He was recognised with the well-respected CEO Award for excellence in genetics extension and data presentation.

ELEVATING STRATEGIC PARTNERSHIPS: LEAD KEY ACCOUNTS MANAGER (2010 - 2014)

David led strategic initiatives that significantly bolstered LIC's revenue and market presence within the corporate farming segment. He also implemented a successful Rapid Prototyping programme and developed LIC's Iwi Strategy.

REVOLUTIONISING MARKETING: CORPORATE MARKETING MANAGER (2008 - 2010)

As Corporate Marketing Manager, David was responsible for the commercial launch of genomically selected sires in 2008. The campaign resulted in over 600,000 straw sales in the first year and he was recognised with a CEO Award for his focus on improving the understanding of the Breeding Worth index.

EMBRACING INNOVATION: PRODUCT MANAGER (2006 – 2008)

In his role as Product Manager, David launched innovations such as single sample Herd Testing and BVD Antigen ELISA testing.

WHAT DOES THE FUTURE HOLD?

At the core of LIC's purpose is a commitment to ensuring the profitability of their farmers, achieved through continual advancements in herd improvement. A focal point of this effort is optimising cow efficiency - which is all about getting more milk solids for every unit of feed consumed. For LIC's global farmers, the commitment remains the same - to provide superior grazing genetics characterised by high milk solids and a robust fertile cow that will last in herds. Domestically, LIC is collaborating closely with Fonterra to reduce scope 3 emissions by 2030 through genetic gain, improved reproductive performance, and enhanced animal health. This year also marks an exciting milestone as LIC launches a new genomic testing service to New Zealand farmers and advances their research on breeding low methane-emitting cows. Looking further ahead, LIC should also have high genetic merit heat-tolerant bulls available by 2030 as a result of advancements in LIC's heat tolerance programme. All of this means that LIC's farmers are well set up to be profitable now and into the future.

Jan de Jong

DAVID CHIN

Presents at the SA Dairy 2020 meetings 2023

SA DAIRY 2020

The way the product is produced varies greatly, NZ has a low input, virtually unmechanised, simple system with very little labour component but with increasing political involvement. South Africa has (in general) a system with strong machinery involvement, a relatively high labour component, rations that may have many additives available and low government involvement, to the extent that veterinary controls do not operate, even OBP (Onderstepoort Biological Products) cannot make or deliver vaccines at present.

At face value the only similarity between what a South African dairyman and a New Zealand dairy operator do is produce the same commodity.

New Zealand relies on a pasture forage system, if supplements are fed, they are bought in and fed at low levels to predominantly extend lactations. Our systems rely largely on purchased concentrates and home - produced inputs to increase production levels.

Seasonal production and low inputs have generated a system that has enabled New Zealand to be a world leader in dairy product production despite its unfavourable geographical position. South Africa can leverage off these advantages and other practices of successful producers in certain respects to our advantage.

Management in a low - cost production system entails no rocket science, just basic good planning and control.

South Africa has any number of units that have grown over the last three years, to the extent that the average farmer is milking 1000 cows or more, and units can rightfully be classed as corporate structures. The question thus arises, are we correctly managing these units as such. Cigarette box calculations will not cut it now, nor will shoddy planning. At least not if a sustainable large scale, multiple dairy site operation is the aim.

Until now, most planning has been at central level, the farm owner or his accountant (with input very often from the Agricultural banker). Problem is that all planning is often considered as an annual event, which it is not. Some planning is annual (production orientated – health plans, heifer rearing plans, mating decisions and dairy consumables) and should theoretically be planned by the person involved – the dairy or unit manager. These costs, financial requirements and husbandry policies are "uploaded" to those at higher level.

Longer term planning would relate to forage, fodder planning and genetic strategy, multi - year enterprises and budgets. These would be controlled and managed by senior team members, in conjunction with unit managers. Semi - permanent or long - term strategic planning would fall within the ambit of the farm owner or enterprise manager. These are items such as dairy unit planning, irrigation planning, physical planning and even additional land purchases. In other words, permanent farm investment.

The ultimate objective of this planning, briefly described, is how finite resources are allocated: who does what, when. No slacking and dodging responsibility is possible. The job is defined to a person or team.

Jan Bonsma, the developer of the Bonsmara cattle breed had the adage: "Man must measure", basically the same as Peter Drucker, a business guru of the 1960's, who wrote: ''What gets measured gets managed". Applying this, most large businesses have report backs or monthly reports, which can be painful processes depending on the format used. Physical data at unit level should be easily collated, presented monthly with actual versus budgeted in a single page report - mostly in graphic and tabular format with very little writing and verbiage. With good systems these reports should be painless to prepare, be accurate, objective and of benefit to the operation.

In South African Afrikaans the term "voorman" denotes a foreman, a person who dutifully reported to somebody above him. This was a person who could never develop – that person was not empowered to make decisions, manage or improve skills. At today's levels, and with the salary that Dairy managers are paid, one would not want a foreman, but a person who could operate with energy and precision in his environment, taking decisions and uplifting those below him. With a large operation mundane decision making is correctly taken out of the hands of the top echelons of the business.

How the business operates and the success with which it works depends on how problems are dealt with at production level by staff. The speed at which these unforeseen problems (these are not challenges, challenges are just polite political speak for a *snafu*) are handled and solved is an indication of how the staff are appreciated, empowered and trained. M&H

David Hale, LIC national AB manager

ARE 2 AB TECH VISITS BETTER THAN 1?

In Spring of 2020, LIC undertook what's believed to be New Zealand's first robust trial to determine whether a twice-daily AB tech service would improve conception rate, getting more cows in-calf.

Scientific results showed there is no case for increasing daily visits by LIC AB Technicians.

In other words, there was statistically no significant difference between the twice-a-day (TAD) and once-a-day (OAD) groups in conception rate, either within, or across herds (see table 1, below).

The 8000-cow trial took place across four separate farms on Rakaia Island in Canterbury.

Cows were split into two groups:

- Cows with even-numbered tags were visited by an AB technician twice-a-day (AM and PM)
- Cows with odd-numbered tags were visited by an AB technician once-a-day (AM only)

All inseminations followed oestrus that was initially picked up using collar technology as the heat detection device.

More than 9100 inseminations were completed during the six-week trial.

Although both groups of cows were inseminated once-a-day, the cows that were serviced by an AB technician in a twice daily visit were inseminated within a 12 hour window of oestrus alert (which some industry players believe may improve conception rate).

The research was headed by ZhenZhong Xu, LIC scientist and research leader (reproduction), who was supported in the field by Dave Hale, LIC national artificial breeding manager, and Garth Stearn, LIC's upper South Island territory manager.

Dave Hale said the outcome of the controlled trial has reaffirmed the value that a once-a-day AB tech service delivers.

"We're committed to getting our farmers cows in-calf. If there was a genuine benefit in providing a twice-a-day AB tech service, we'd look closely at providing it, however this research has shown there's no value when it comes to conception rate."

"From the data we can see that cows have the best chance of getting in-calf when they're inseminated within the optimal breeding window (4 – 19 hours), which a once-a-day AB tech service achieves."

The frequency distribution in the time of insemination relative to oestrus alert is shown in Figure 2 for cows in the two trial groups.

The large peak for OAD cows at 4 hours reflected the fact that a high proportion of cows had oestrus alerts between 2 and 6 AM and most morning inseminations were carried out between 6 and 10 AM.

Herd Name	Once-A-Day			Twice-A-Day			Total		
	Insems	Pregnant	C.R.,%	Insems	Pregnant	C.R.,%	Insems	Pregnant	C.R.,%
Harakeke	818	411	50.2	862	416	48.3	1680	827	49.2
Tussock	1499	794	53.0	1502	836	55.7	3001	1630	54.3
WestEnd	1556	828	53.2	1528	828	54.2	3084	1656	53.7
Willow	709	393	55.4	713	390	54.7	1422	783	55.1
Total	4582	2426	52.9	4605	4605	53.6	9187	4896	53.3

Figure 2 shows there was a clear shift in time of insemination to the right for cows in the TAD group; inseminations between 0 and 4 hours were reduced, and inseminations between 8 and 16 hours were increased. There were no obvious differences between trial groups in distribution of inseminations after 16 hours.

The conception rate of inseminations at different times after oestrus alert is shown in **Figure 3**.

Inseminations in both trial groups are combined to increase insemination number at each time point.

The graph shows there was a wide time period, between 4 and 19 hours, when a high conception rate (around 55%) was achieved. Inseminations between 0 and 3 also achieved a conception rate above 50%.

Conception rates decreased rapidly after 25 hours.

Results in **Figure 2** and **Figure 3** help explain why twice-daily AB tech visits did not improve conception rates.

Results in Figure 2 show that having two opportunities in a day to inseminate cows shifted most inseminations from the period between 0 and 4 hours to between 8 and 14 hours, when conception rate did not differ greatly. However, twice-daily AB tech visits did not reduce the proportion of inseminations carried out after 20 hours, when conception rate was reduced.

Based on results in this trial, twice-a-day visits by the AB technician did not significantly improve conception rates for lactating dairy cows grazing on pasture. The current practice of submitting cows for insemination at the first opportunity after oestrus detection applies to all animals on heat, whether alerted by a collar system, a heat detection aid, or farmer observation.

Figure 2. Frequency distribution in time of insemination relative to oestrus alert for cows in once-a-day (OAD) and twice-a-day (TAD) groups.

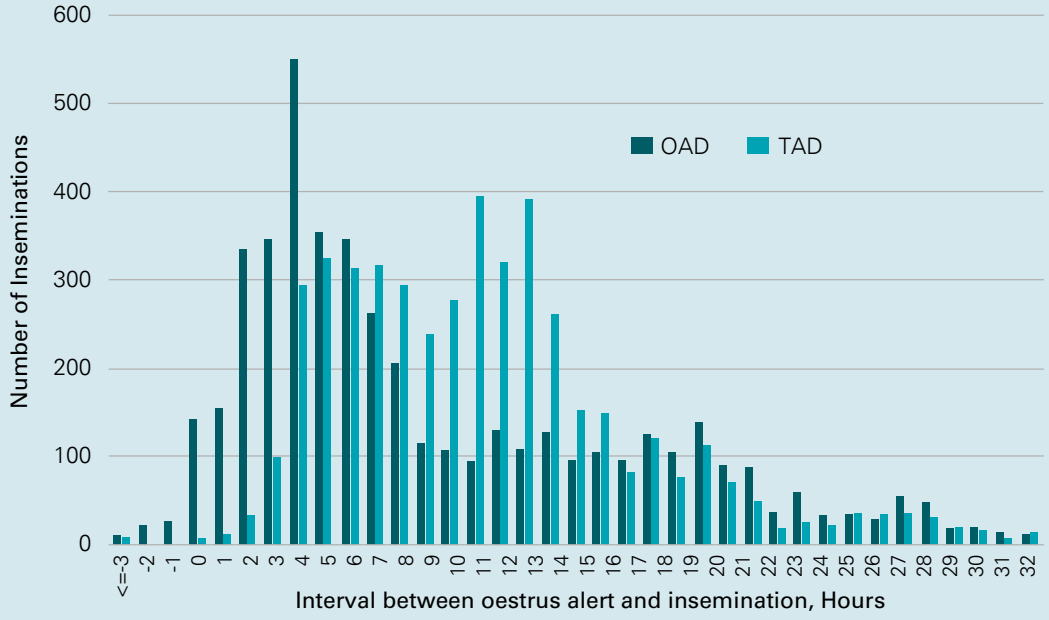
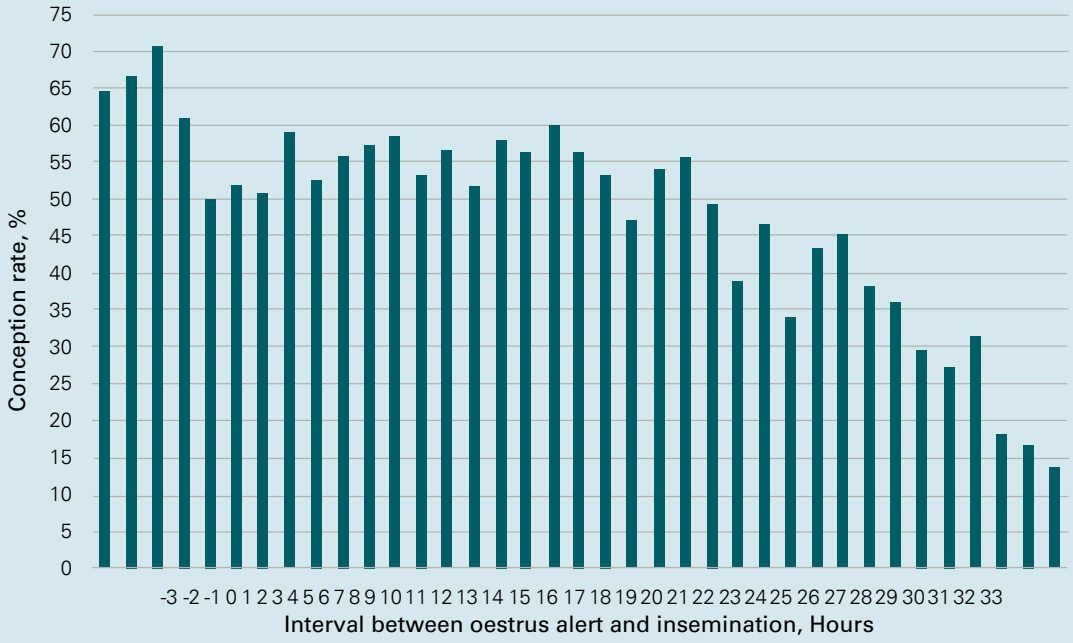


Figure 3. Conception rate of insemination at different times after oestrus alert.



Johan Müller, Genimex

Etienne Zeeman verwelkom almal op sy plaas naby Swellendam

DEENSE JERSEY GENETIKA STAAN STERK WÊRELD WYD

Peter Larson van VikingGenetics besoek Suid Afrika

Peter Larson, Jersey Rasdirekteur van VikingGenetics, het in Oktober 2023 Suid Afrika besoek. Die besigtiging van dogtergroepe by vier Jerseytelers asook die twee aanbiedings oor die nuutste strategië aangaande die verdere ontwikkeling van die Jerseyras, was die kern van sy besoek.

Hy het ook besoek afgelê by die Naude's van Oudewagendrift in die Worcester omgewing. Peini Naude, sy seun Heinrich en broer Johan melk tans 1500 koeie. Ongeveer 750 hiervan is Jerseys en die res Holsteins. 'n Moderne behuisingstelsel is onlangs voltooi waar koeie gevoer word. Hulle handhaaf tans 'n produksie gemiddelde van ongeveer 28 liter per koei per dag, met 'n indrukwekkende 4,7% bottervet en 3.6% proteien. Om inteling te beperk maak hulle gebruik van die "VIKMATE" paringstelsel en tans gebruik hulle die bulle VJ Jabra, VJ Happens en VJ Danka. By die Holsteins word VH Faruk, VH Nader en VH Crown gebruik.

Peter Larson, Chris Cloete en Peini Naude tydens hul besoek aan Oudewagendrift

Ook is besoek afgelê by Rob Visser van Dalewood Cheese naby Stellenbosch. Rob melk ongeveer 150 Jerseys. Hy het reeds verskeie internasionaal toekennings verwerf met sy kaas wat insluit 'n wêreldkampioen kaas. Rob gebruik tans die bulle VJ Jabra en VJ Danka.

Heinrich du Preez – kudde bestuurder, Peter Larson en Rob Visser

Die eerste plaas waar dogtergroepe besigtig is was by John Walker van Ouplaas naby Greyton. John melk ongeveer 1600 Jerseys. Hierdie is een van die grootste volgeregistreerde Jersey kuddes in die land met uitstekende produksies. (Sien elders in artikel.) John maak gebruik van die Stamboek teelprogram en gebruik tans VJ Jojo, VJ Sorlyck, VJ Danka, VJ Splash, VJ Jabra en VJ Jumbo. Ons het groepe dogters van VJ Garant, VJ Lando, VJ Jocko, VJ Husky, VJ Quintana en VJ Hitman gesien. Uitstekende bouvorm en uiers was die kenmerk. Peter het die groepe bespreek en was veral beïndruk met die hoë standaard van uiers en hoewe. Die VJ Garant dogters het beïndruk met besonderse suiweleienskappe en lengte. Die VJ Huskys was reeds in hul 3de en 4de laktasies en het ontwikkel in groot sterk koeie.

VJ Garant dogters by John Walker

Die tweede plaas was Spes Bona van die Van Niekerk broers en neefs. Willie, sy seun Wimpie en Jaco Conradie, die kuddebestuurder, melk ongeveer 550 Jerseys. Hulle gebruik Viking bulle vir meer as 20 jaar en handhaaf uitstekende vastestof produksies. Hul bottervet en proteïen van meer as 5,35% en 4.04% onderskeidelik, is van die hoogste in SA en word op 'n jaarlikse gemiddelde behaal.

Dogters van onder andere VJ Jocko, VJ Hays, VJ Gislev en VJ Garant is besigtig en veral die VJ Jocko en VJ Hays dogters was besonder indrukwekkend.

Die VJ Hays dogters by Van Niekerk boerdery

Willie en Wimpie van Niekerk hier saam met Peter Larson by die VJ Gislev dogters

Op die 2 de dag is besoek afgelê by Henk van Zyl en Etienne Zeeman in die Swellendam omgewing. Henk melk 600 koeie op volvoer en 300 koeie op weidings. Sy gemiddelde produksie op die hoë produksie groep is 32 liter per dag en die op weidings is ongeveer 16 liter per dag. Sy gemiddelde vastestowwe vir September 2023 was 5.35% bottervet en 4% proteïen.

Pragtige groepe dogers van VJ Hihl, VJ Quintana, VJ Hilario, VJ Garant, VJ Gutz, VJ Gislev, VJ Jocko en VJ Hays is vertoon. Weereens het koeie beïndruk met besonderse uiers en bouvorm.

Peter Larson bespreek 'n groep VJ Gislev dogters by Henk van Zyl

By Etienne Zeeman, wat slegs van weidings af melk produseer, is VJ Husky, VJ Garant, VJ Lirsk, VJ Hilario, VJ Quintana, VJ Dandi en VJ Gutz dogters gewys. Opvallend was die uitstekende kapasiteit van die koeie met veral die ouer VJ Lirsk koeie wat besonders was. Etienne was 4 keer in die laaste 6 jaar die kudde met beste somatiese seltelling op LNR se melkaantekening data rekords. Sy gemiddelde bottervet van 5.25%, proteïen van 4.14%, en somatiese seltelling van 128551 vir die jaar van 2022, is van de beste in die land. Etienne skryf dit toe aan sy jarelange beleid van om die beste Deense Jerseybulle, geselekteer vir die eienskappe, intensief te gebruik. Om sy stelsel te vereenvoudig gebruik hy tot 1000 dosisse per bul.

VJ Hilario dogters by Etienne Zeeman

Peter Larson, wat hoofsaaklik aan die Universiteit van Kopenhagen gestudeer het en sy MSc graad in veeteelt verwerf het, is vir die afgelope 25 jaar baie nou betrokke by die ontwikkeling van die Jerseyras in Denemarke. Sy verantwoordelikhede behels onder andere die daarstel van 'n teeldoelwit vir die ras. Hy is dus in beheer van die program wat dit ten doel het om hierdie doelwitte te bereik tot voordeel van alle Jerseytelers plaaslik en internasionaal. In sy aanbiedings het hy veral klem gelê op die belangrikheid van die akkuraatheid van data. Meer as 90% van alle Jerseykuddes in die Vikinggroep neem deel aan hierdie data versameling.

Hy skryf die sukses en leiding wat die Deense Jersey as ras wêreldwyd handhaaf met, vrugbaarheid, uiergesondheid en die produksie van volume vastestowwe, toe aan die volgehoue meting en seleksiedruk in die verband, (Reeds sedert die vroeë tagtige jare.)

Viking is tans besig om 'n teelwaarde vir voerinname effektiwiteit te ontwikkel. Die gewig en voerinname van koeie word deur middel van kameras wat bokant die koeie geïnstalleer word, gemonitor. Vroeë studies het reeds groot verskille in die inname van voer uitgewys wat baie duidelik bewys dat kleiner koeie soms minder voer inneem en selfs meer produseer as sommige swaarder koeie. Hierdie indeks sal verder bydra om bulle beskikbaar te stel wat meer effektiewe nageslag sal teel wat verder sal bydra tot ekonomiese volhoubare suiwelboerderye.

Dit was 'n uiters suksesvolle paar dae en was uitstekend ondersteun deur boere uit die Suid, Oos en Weskaap. Dankie aan almal wat die moeite gedoen het om saam te ry. Baie dankie aan John Walker, Willie van Niekerk, Henk van Zyl, Etienne Zeeman en hul bestuursspanne. Dit was 'n plesier om vir kliënte jul plase en koeie te wys. Jul bestuurs- vernuf en passie was vir almal 'n aangename ondervinding. M&H

Hanna Driscoll, Product Manager, VikingGenetics

Reduce the Carbon Footprint of your Herd

VIKINGGENETICS innovative breeding

With the rising cost of feed and a growing need to reduce the carbon footprint, it's important to find ways to improve the efficiency and productivity of your herd.

When you focus on breeding for improved feed efficiency, you not only reduce production costs and optimise overall farm returns. You also **reduce the CO2 footprint** and contribute to **more climate-friendly dairy production**.

Over the past decade, the scientific community has investigated paths to **reduce methane emissions**, through different scientific disciplines, such as animal nutrition, physiology, management and genetics.

Some of the approaches include:

- feed additives to reduce emissions (nutrition)
- identifying lower emitting animals at the same level of production (genetics)
- improving animal health, replacement of animals
- manure management
- reducing consumption of animal products

Nevertheless, the advantage of genetics is that the reductions in CH4 are cumulative through generations and permanent. With the heritability of methane traits at around 0.20, genetics is an important tool for reducing the carbon footprint of the dairy industry.

RESEARCH INTO METHANE EMISSIONS IN DENMARK

The 7-year-long research into methane emissions in Denmark has collected over **26,000 CH_4 breath records** from **647 Holstein cows**. Data has confirmed that there is a substantial variation in the population.

Methane intensity (methane per kg of milk produced) ranges from 1.9 to 29.5 g CH4 per kg of ECM milk produced, with the average at 9.2.

Also for the **methane yield** (methane per amount of feed consumed), there is a great variation between the animals, ranging from 3.7 to 35.8 g CH4 per kg of DMI with the average at 15.4.

HOW CAN BREEDING HELP ACHIEVE THE DESIRED METHANE EMISSIONS FASTER?

The Danish study has evaluated three different scenarios for developing the selection index:

- **Scenario 0** – only selecting for Energy corrected milk (ECM)
- **Scenario 1** – include residual feed intake
- **Scenario 2** – include residual feed intake and methane

The selection index, which includes both residual feed intake and methane, would allow **a significant reduction in residual feed intake** and **residual methane production** to be achieved without a major loss in Energy corrected milk production.

According to the study, including methane in the breeding goal could help achieve the desired methane emission reductions in dairy cattle faster.

The study has confirmed that there is a strong positive correlation between feed efficiency and methane production traits (the genetic correlation between the trait for methane emissions 'Residual methane production on ECM (energy corrected milk) and MBW (metabolic body weight)' and the trait for feed efficiency 'Residual feed intake on ECM and MBW' is equal to **0.48**).

The study has also investigated the impact that cutting methane emissions would have on the bottom line.

Including methane in the selection index gives a reduction in residual methane production of **1.11 kg of methane per cow per year**. With the total number of dairy cows in Denmark standing at 550,000, this results in **698 tonnes CH_4** or **51.4K tonnes CO_2 equivalents** (CO_2e).

Including methane in the breeding goal could lead to **savings of €11 million** in one year for the dairy industry, just in Denmark alone.

Hanna Driscoll, Product Manager, VikingGenetics

	Scenario 0 Only selecting for ECM	Scenario 1 Including residual feed intake	Scenario 2 Including residual feed intake and methane
ECM	4.67	4.65	4.58
Residual feed intake	0.30	0.28	0.23
Residual methane production	2.71	2.27	-0.88

1 tonne of CH4 = 84 tonnes CO2 equivalents (CO2e) for a 20-year global warming potential period

Economic impact: €200 per tonne CO2e

Source: Coralia I.V. Manzanilla-Pech, Rasmus B. Stephansen, Gareth F. Difford, Peter Løvendahl, Jan Lassen 'Selecting for feed efficient cows will help to reduce methane gas emissions'. Published: Frontiers in Genetics, 26th May 2022

LONG-LASTING COWS BENEFIT THE CLIMATE

Healthy and fertile cows that live long in the herd help to reduce the herd's climate footprint. **Long-lasting cows** are not only good for securing profitability and improving animal welfare, they also help **reduce the milk's climate footprint**.

This is because the climate impact that comes from rearing cows can be distributed over a higher lifetime production.

With better longevity, you can also **reduce replacement costs**. This greatly helps achieve more climate-friendly milk production, as the herd's total methane production is reduced, with fewer animals needed to sustain milk production, as well as lower feed costs.

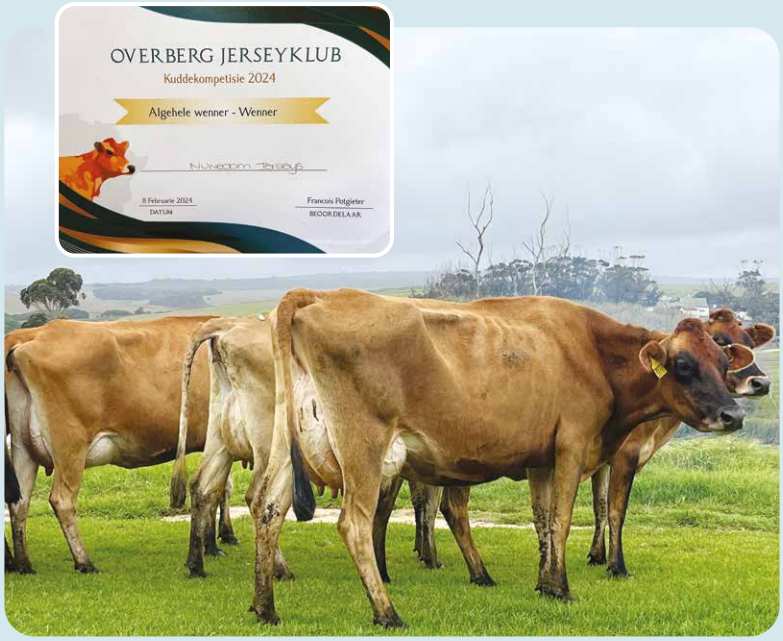
The genetic improvement that you achieve is a permanent and desired improvement **accumulated through generations** and it will increase your profit margins. M&H

NUWEDAM JERSEYS WEN OVERBERG JERSEYKLUB SE KUDDEKOMPETISIE 2024

Johan Müller, Genimex

Herman van Dyk, kuddebestuurder by Nuwedam, en sy assistent James Gwampi

Hadré Pratt, eienaar van Nuwedam Jerseys en Herman van Dyk, kuddebestuurder.



Die Nuwedam kudde van Hadré Pratt het vanjaar uitstekend gevaar op die Overbergse Jerseyklub se jaarlikse kuddekompetisie. Wat hierdie prestasie nog meer uitsonderlik maak is die feit dat die kudde minder as 10 jaar oud is. Die suiwelvertakking bestaan uit twee plase, Nuwedam en Nuwepos. Beide het 60 punt "rotary" stalle waar altesaam ongeveer 1500 Jerseys gemelk word. Hulle het 'n uitstekende totale punt behaal wat hulle die wenners posisie gegee het. In die kategorie – Vaar se dogtergroep, het hulle met 'n groep VJ Garant dogters 'n 2de plek behaal. Dit nieteenstaande die feit dat Herman meer as 25 dogters van hom ingeskryf het nie. VJ Garant teel dogters met baie goeie produksie en veral dogter vrugbaarheid. Groot sterk dogters met besonderse uiers rond sy ontleding af.

Baie geluk Hadré en jou span! Herman gebruik tans die bulle VJ Danka en VJ Jabra. M&H

Louise Helmer, CEO VikingGenetics

NORDIC GENETICS = STRONGER BOTTOM LINE

VIKINGGENETICS innovative breeding

The history of farming is the history of the world. In Denmark, up until one generation ago, approximately half of the population had a direct relation to agriculture in one way or another. Some were farmers, some worked on farms and lived in peripheral villages, and others were suppliers and lived close by.

As food providers, **farmers shaped the fabric of society** as we know it. Building on the **forward-thinking Nordic cattle breeding model** is our way of honouring this.

Genetics is the base for the growth and development of dairy businesses. At VikingGenetics, we aim to **bring superior value to farmers** and continue **providing innovative genetics** that make herds more profitable and life more manageable.

VikingGenetics was founded in the spirit of Nordic cooperation. With our owners, **VikingDanmark**, **Växa**, and **Faba**, we are paving the way to better genetic development and supporting the future production of high-quality food.

Breeding and research and development are the guiding stars of this philosophy, or "**Breeding ++**", as we call it. In this marriage, collaboration is the name of the game, and it is critical for innovation.

At the core of Breeding++ lies a triangle of **collaboration between dairy farmers, researchers,** and **breeding organisations** – all parts of a value chain.

The future Nordic breeding goal is **NTM**. Years of patience and collaboration have been rewarded with excellent results and **genetic progress**.

Tools such as the **Saved Feed Index** are designed to help farmers adjust to shifting political demands while still being able to run profitable businesses. We are realising this by investing in value-creation projects, such as the **CFIT** and **ONIMIT systems**.

The main purpose of CFIT (Cattle Feed Intake Systems) is to help the farmer reduce the cost of feed, by getting more feed-efficient cows, whereas the ONIMIT (On-farm monitoring of Methane emissions from dairy cows) project is a project for making it possible to have a Methane index in near future, which will make it possible to reduce the carbon footprint from the dairy production without compromising on all the other important traits we have bred for, for decades.

By investing in these tools, we create more value, boost our breeding, and **collect more of the data that makes us so reliable**.

Rising feed prices, taxes, and political constraints put stress on your bottom line and lifestyle. A future-friendly model that balances this is what our genetics are working towards. Sustainability is the future, but **for businesses to be sustainable, they must be allowed to stay afloat in the first place**.

Like NTM, **future-friendly farming** means a stronger bottom line and a better life for farmers.

To us, future-friendly farming is supported by four pillars: **profitable businesses, healthy animals, efficient herds,** and **satisfied farmers**.

Genetics are 50% of the solution; an efficient herd will give you more time to manage your business and enjoy an easier life.

Genetics have the power to steer the sustainability agenda in a direction that supports farmers' bottom lines, global food supply, and securing a better future.

FROM THE NORDICS TO THE WORLD

The contract between farmers and society that I described at the beginning is also present globally. When we innovate at home, we give back to the world with our tradition of forward-thinking food production.

Our international partnerships in **South Africa, Australia, Germany, the UK,** and **50 other export markets** show our commitment to improving cattle genetics and spreading **the prosperity of Nordic breeding worldwide.**

Elizna Erasmus, Genimex

VIKING JERSEY

The Jersey fitting future demands

During the 2nd week in October, we had a visit from the VikingJersey breeding manager Peter Larson. Johan Müller and Willem van Lingen arranged farm visits and two very successful farmers days were held in the Southern Cape.

During the four herd visits we clearly saw the impact that VikingJerseys can have in a jersey herd, irrespective of the system they are used in. Across the board we saw strong, capacious cows with good feet & legs and excellent udder traits. Viewing the daughter groups together made it apparent that the VikingJersey breeds uniformity.

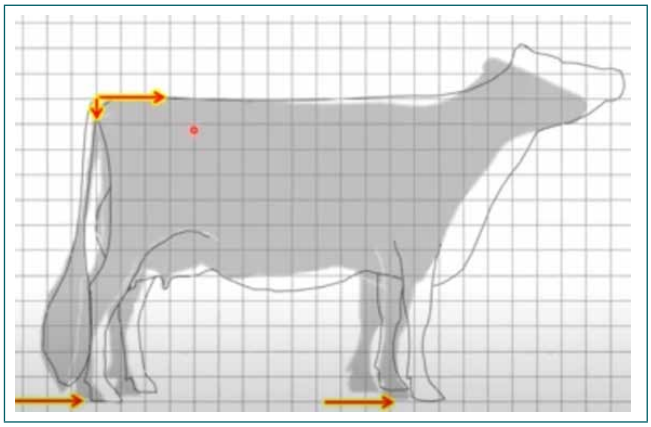
VikingJerseys are efficient, medium-sized cows that (cows weighing 444kgs in their second lactation) produce high volumes of milk with the highest levels of fat and protein percentages. They are international breed leaders in fertility and health and that ensures longevity in the herd.

Two DJ Lix daughters in Ettiene Zeeman's herd, both in their 10th lactation

In his presentation, Peter Larson also discussed with us the importance of the jersey cow for the future of the dairy industry. Pressure is applied on the industry to be more efficient and to lower environmental impact. This can only be achieved by having more efficient cows, meaning cows that produce more with a lower feed intake.

With a national database of 72 300 fully recorded purebred jerseys, reliable data can be assessed to better understand the role of the jersey cow in the future. With this, VikingGenetics can focus their breeding programs to breed for improved efficiency.

THE SCENCE BEHIND THE EFFICIENCY OF THE JERSEY COW



If a jersey cow would be enlarged proportionally to the size of a Holstein, this would be the result.

- She would have a bigger head and wider muzzle for grazing efficiency
- She would be more capacious, increasing space available for the rumen
- She would have a wider chest that allows for more space for heart and lungs, increasing efficiency when walking

When comparing production efficiency of Jerseys and Holsteins the following has been noted;

- The jersey cow will have a 5%-20% increased DM intake/kg Liveweight
- The jersey cow will have 9%-34% higher production of milk solids/kg Liveweight
- The jersey cow will have an 8%-19% lower energy demand for equal solid production
- The Jersey cow will have a 18%-20% lower Carbon Footprint
- The jersey cow will spend the same time eating, but will have a lower feed intake
  - Jerseys spend more time on consuming and ruminating one unit of feed
  - Jerseys will spread the feed intake moments equally across the day.

VikingJersey gives you the highest lifetime production and daily profit per cow, making your dairy business profitable, long-lasting, and enjoyable. M&H

Gemma Worth, LIC scientist (quantitative genetics)

BREEDING HEAT TOLERANT DAIRY COWS

Increasing global temperature is a major challenge to the sustainability of livestock production and is driving a need to improve the heat tolerance of our dairy population.

Sustained hot temperatures (>22°C) have significant welfare implications for dairy animals through increased body temperature and respiration. Animal performance is also compromised through reduced feed intake, milk production, fertility, and calf birthweights. Dairy cows are especially susceptible to heat stress due to their high metabolic heat load associated with the demands of lactation.

In pastoral grazing systems, dairy cattle are exposed to heat load from solar radiation in addition to the impact of ambient temperature and the metabolic load of grazing and walking to and from the milking parlour.

SLICK cows at LIC's Innovation Farm

Heat tolerance is a heritable trait in dairy cattle, the most heat tolerant are the less productive, smaller Zebu-type (*Bos indicus*) cattle found mostly in tropical climates. A popular breeding strategy to reduce heat stress has been to introduce Holstein genetics into local Zebu breeds to improve lactation performance while maintaining heat tolerance traits. However, this strategy presents difficulties to maintain all desired characteristics in subsequent generations. Nevertheless, development of composite (*Bos indicus/Bos taurus*) breeds such as the Girolando (dairy) and Bonsmara (beef) breeds has been successful in Brazil and South Africa respectively.

Another approach to mitigating heat stress is to use genetic selection to increase thermotolerance of established *Bos taurus* dairy breeds. An approach adopted by LIC is to introduce the 'SLICK' gene into dairy breeds. Existence of the SLICK gene was initially identified by scientists at the University of Florida in Senepol cattle (*Bos taurus*), a heat tolerant beef breed from the Caribbean. LIC scientists characterised the causative genetic variant in the Senepol breed and developed a diagnostic test. Senepol were known for their high heat tolerance and sleek coat and subsequently other genetic variants of the same causative gene has been identified in beef and dual-purpose breeds from the same region. The obvious characteristic of all these heat tolerant breeds (including Bonsmara) is the short-hair coat. Because the SLICK trait is produced by a single mutation (easy diagnosis) and is dominant (one gene copy only is needed) introduction of the trait into other breeds is facilitated.

Gemma Worth, LIC scientist (quantitative genetics)

A slick coat vs a non-slick coat

In 2014, LIC began crossing Senepol sires with New Zealand dairy genetics to start the introgression of SLICK into a dairy genetic background. The resulting animals have a sleek, short hair coat and an improved ability to regulate body temperature under heat load.

Our research has shown that cattle carrying the SLICK gene demonstrate a lower rectal and rumen temperature (0.5 to 1.0°C) compared to their non-SLICK counterparts when managed under normal farm conditions (grazing) in summer (Figure 1). Furthermore, no significant differences in rumen temperatures have been observed between the two groups during the New Zealand winter months (Figure 2). Research at the University of Florida and in Puerto Rico has demonstrated that SLICK carriers have higher milk production during the summer months where ambient temperatures can often reach 35°C.

Work at LIC has focused on maximising genetic merit through utilizing the Breeding Worth (BW) in SLICK carrier offspring while also gathering data relating to lactation performance, liveweight, coat characteristics, and heat (and cold) tolerance on the emerging SLICK animals. Our research has been undertaken at LIC's Innovation Farm in Waikato, New Zealand and in collaboration with Massey and Lincoln University.

After several generations, sires carrying the SLICK gene have been produced with a BW that is approaching that of the best dairy sires on offer in the New Zealand industry, with only 1/32 average content of Senepol genes.

In 2023, we selected a group of New Zealand farms to enhance our breeding scheme by custom mating the herds with SLICK genetics, with the aim to increase the rate of genetic improvement and diversity within the breeding programme.

The trial work remains ongoing to ensure LIC has a robust understanding of the performance of the SLICK gene and its potential to improve the welfare of our dairy cows in the future. If progress continues as expected, in 2029 farmers will be able to breed from high genetic merit SLICK KiwiCross™ sires with the resulting offspring having a significant improvement in animal welfare and milk production during heat stress events. (M&H)

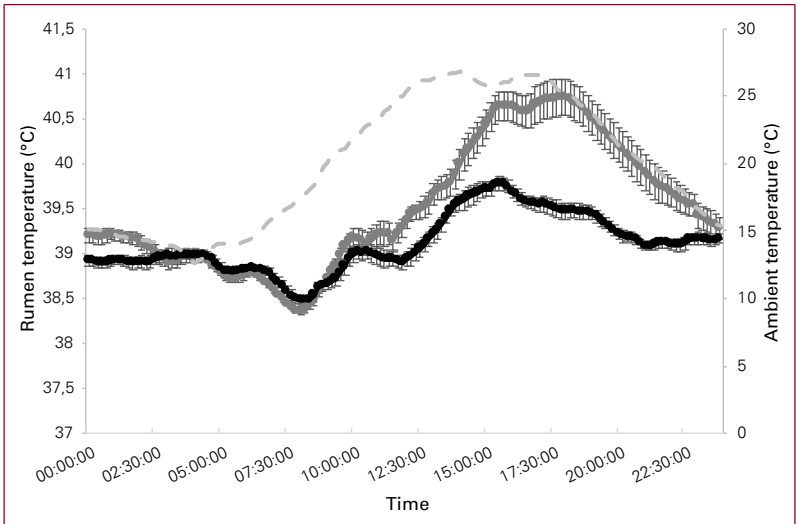


Figure 1: Mean rumen temperatures in summer for SLICK (n=9) and non-SLICK (n=9) cattle, ambient temperature indicated by dashed line.

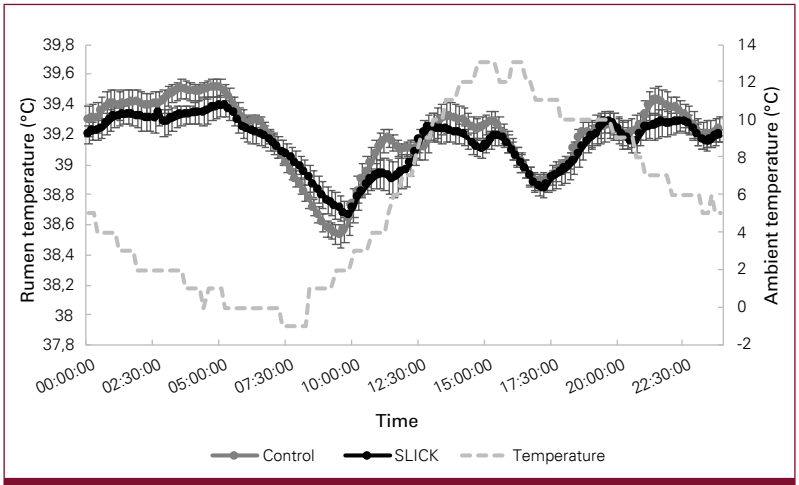


Figure 2: Mean rumen temperatures in winter for SLICK (n=12) and non-SLICK (n=12) cattle, ambient temperature indicated by dashed line.

Jan de Jong

TAKE-HOME POINTS
FROM DAIRY 2020 PRESENTATIONS

David Chin, CEO LIC

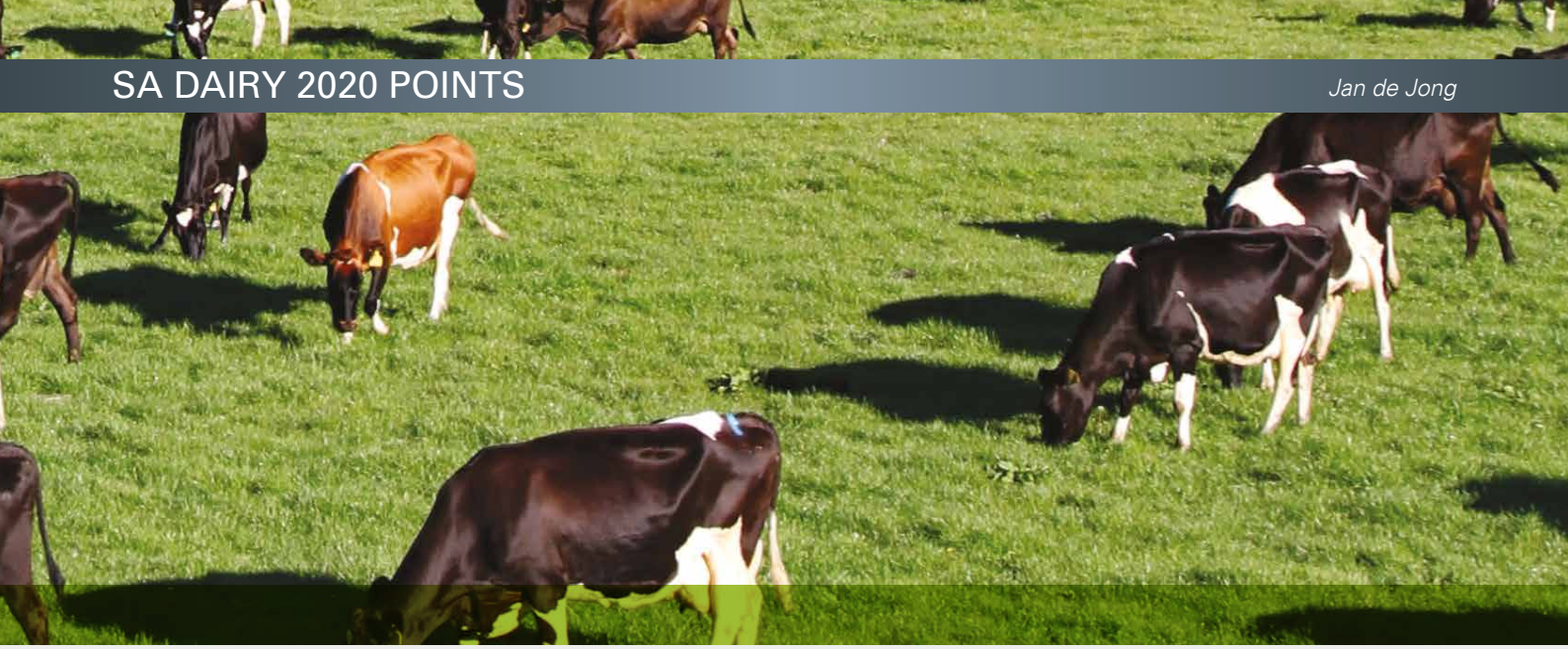
1. Good operators plan, strategize and prepare at different levels for different purposes and over different timeframes.
2. Ongoing monitoring of operation to achieve maximum efficiency of production.
3. Collect usable data that adds value to operation.
4. Staff upliftment imperative, allow them to make decisions.
5. Success: Depends on how confounding circumstances are handled.
6. Know your worst cow.
7. Strive for most efficient producing cows: Production, Reproduction and Longevity.
8. Cow of future will be more efficient producer with lower Methane (Ch_4) emissions.
9. Efficient breeding is a numbers game.
10. Don't sacrifice genetic gain in pursuit of hybrid vigour.

Pete Wichman, Contract Milker Armer Group

1. Keep it simple.
2. Train staff properly in a structured system.
3. Have a strata – who does what.
4. Cull all open cows.
5. Score Body Condition Score (BCS) during various stages of lactation.
6. Leadership requires knowledge, know how to do the job yourself. Management must teach staff what they used to do.
7. Know your staff. Treat them the way they want to be treated.
8. Staff must know the farm strategy and buy in.

SA DAIRY 2020 POINTS

Jan de Jong



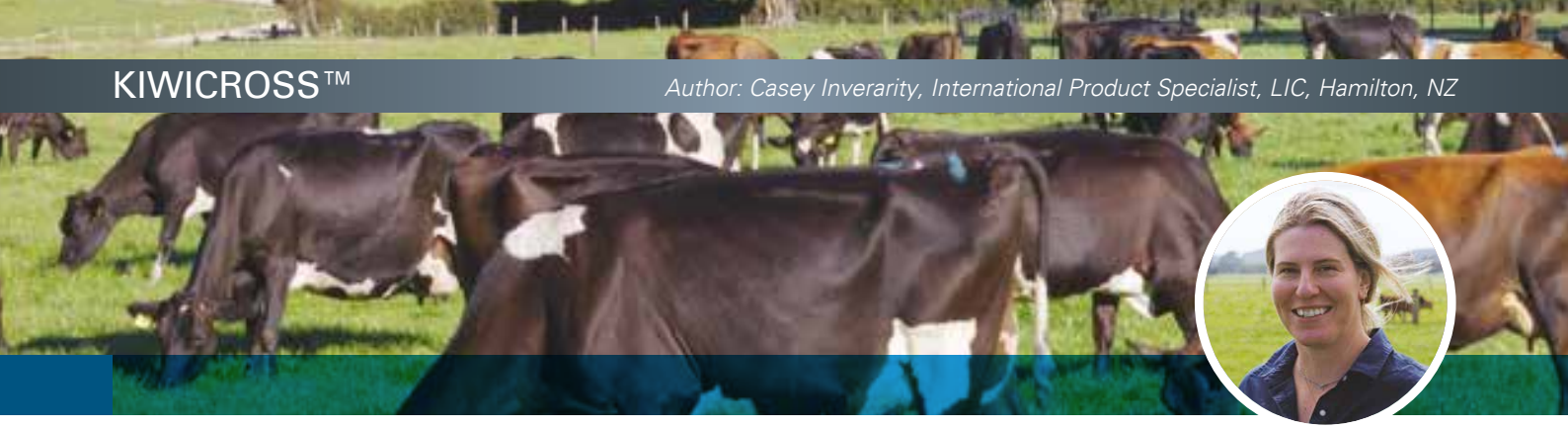
Llewellyn Collett, Director ACS 360

1. Plan and operate within limitations of present situation: Power / Roads / Water / Market conditions / Port inefficiencies (delaying imports).
2. Demand for top SA talent by world – transfer skills to staff.
3. 2% change in production results in either surplus or shortage.
4. Technology moving fast, be selective in taking on new technology.
5. SA price below world market price (world price decreased over last 5 years) - therefore no dumping /imports. Our market has shrunk.
6. Local operations have increased in size by 25% over last 3 years due to efficiency. Inefficient / marginal players out of industry (re-absorbed).
7. Invest in alternative energy (solar), water infrastructure.
8. Social Responsibility, welfare and consumerism requirements can change rapidly.
9. Keep production simple, local dairy is in a better place than many other agricultural products currently eg. Macadamias.

Dr Jane Kay, Principle Scientist Dairy NZ

1. Aim is a profitable and sustainable operation, a factor of competitive and resilient actions, efficient cows, an effective team of people and decreased environmental footprint.
2. Difference between top 25% and lower 75% is percentage of pasture harvested. Difference between usage and residual (not used).
3. Usage is a factor of planning – planned calving date, dry off date, culls off, stocking rate and storage.
4. Cost control is of greater importance than production (yield).
5. Expenses – waste and non-feed costs. With increased production have increased supplement cost, increased labour cost, transport, wastage.
6. Be proactive in terms of: Production system, green-house gas emissions, water quality and quantity, climate and environmental pressure.
7. Least cost nutrient adequate diet with meat and milk costs US$1.98 /day, or US$3.61/day without meat or milk.
8. Research to decrease CH_4 production/cow ongoing.
9. All technology has to be scalable, meet regulatory compliance demands, decrease unsociable hours worked, improve safety considerations and increase reproductive health.
10. Alternative milking schedules need investigation.

Author: Casey Inverarity, International Product Specialist, LIC, Hamilton, NZ



HISTORY OF THE KIWICROSS™ BREEDING PROGRAMME AT LIC

KiwiCross™ bulls are a mainstream breeding option in New Zealand these days but their story began over 20 years ago. LIC started progeny testing KiwiCross™ bulls in the year 2000, they had a clear vision for the breeding programme. There were three main reasons for introducing KiwiCross™ bulls to the LIC SPS programme, all driven by the needs of New Zealand farmers.

Firstly, crossbreeding practices and the crossbred cow were rapidly gaining in popularity. At the time, the percentage of crossbred cows in NZ had already organically grown to 20% of the cow population and the indicators for future growth were strong. Farmers were keen to take advantage of profitability gains from hybrid vigour and to create a 'medium' sized cow that many felt was ideally suited to their farming system. The complementary traits of the parent breeds produced desirable intermediate phenotypes in the offspring for traits such as stature and liveweight, which is important for production efficiency on pasture. Elite genes in other desirable traits were brought together by utilising the genetic strengths of the parent breeds, e.g., protein and yield from the Holstein Friesian, and fertility and fat percentage from Jersey.

Secondly, simplified mating management options were in demand from farmers with first-cross cows in their herds. They sought another option to create some uniformity within the herd, instead of being restricted to the two parent breeds. More nuanced approaches to breed split were also enabled. The lack of a strict breed percentage definition allowed farmers to customise their herd for optimal efficiency in their own farm situation; some could lean more towards the Jersey and others more toward the Friesian end of the spectrum.

Genetic gain was a third and very important consideration. LIC aims to drive genetic gain for a profitable and sustainable dairy sector. The ability to tap into the emerging pool of genetically elite crossbred cows was very appealing. Selection intensity, and thereby genetic gain, could be increased using a wider range of elite cows and bulls as bull-parents. Because NZ had an across-breed evaluation system in Breeding Worth (BW), LIC geneticists could readily compare crossbred bulls and cows against purebreds, ranking them in the national merit index, Breeding Worth (BW). It was simply a matter of requesting and registering a crossbred sire for genetic evaluation.

WHAT HAS HAPPENED SINCE?

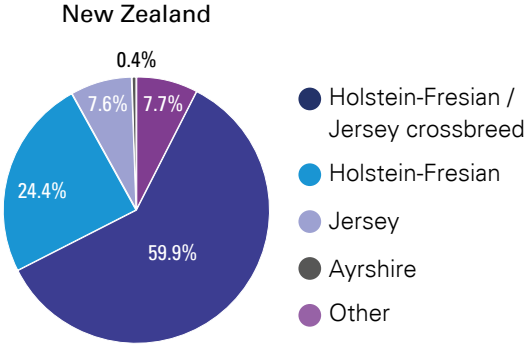
The national trend toward crossbred cows has steadily continued. By 2022/23, 60% of the NZ dairy cow population was crossbred, with many genetically elite crossbred dams among them. (See Figure 1.)

Elite KiwiCross™ males provided the ability to use three genetically elite breeds as sire of sons and their use is well-established in the LIC breeding programme, (see Figure 3).

In its first year in market in 2005, the KiwiCross™ bull team accounted for 14% of LIC inseminations. Sire Proving Scheme (SPS) farmers had already reported very positively about the lively and robust calves that reared easily and milked just like the other crossbred cows. The increase in popularity has continued. By 2022 crossbreed sire usage in NZ reached within 5% of that of Holstein Friesian (HF) sires. Today the majority (78%) of HFxJ crossbreed semen is used over crossbreed cows, with many farmers settling into a steady KiwiCross™ breeding programme. Crossbreed bulls are used over the parent breeds as well, accounting for almost 15% of crossbreed inseminations in 2022.

By 2020-2022, crossbreed bulls sired around 40% of crossbred cows, the remainder being sired by purebreds; HF 40% and Jersey <20%.

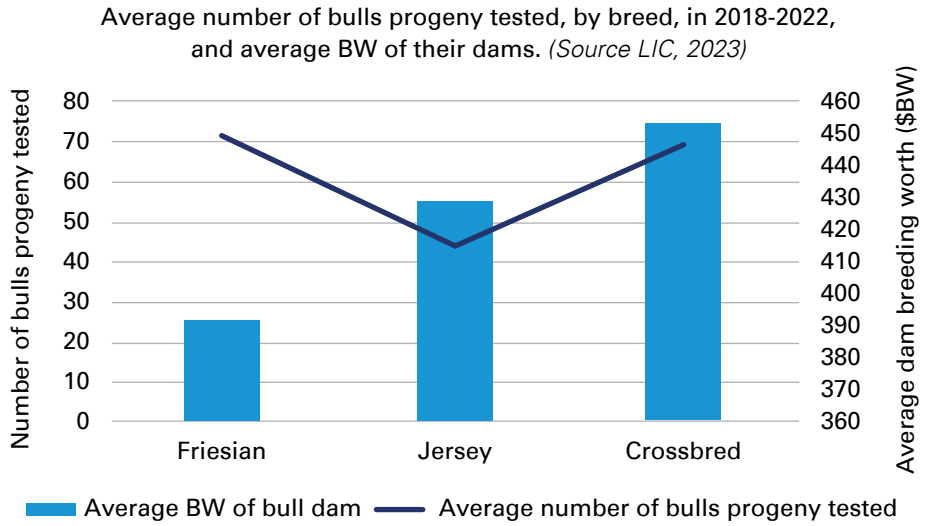
Figure 1. NZ cow population make up by breed
Source: NZ Dairy Statistics, 2022/2023



Author: Casey Inverarity, International Product Specialist, LIC, Hamilton, NZ

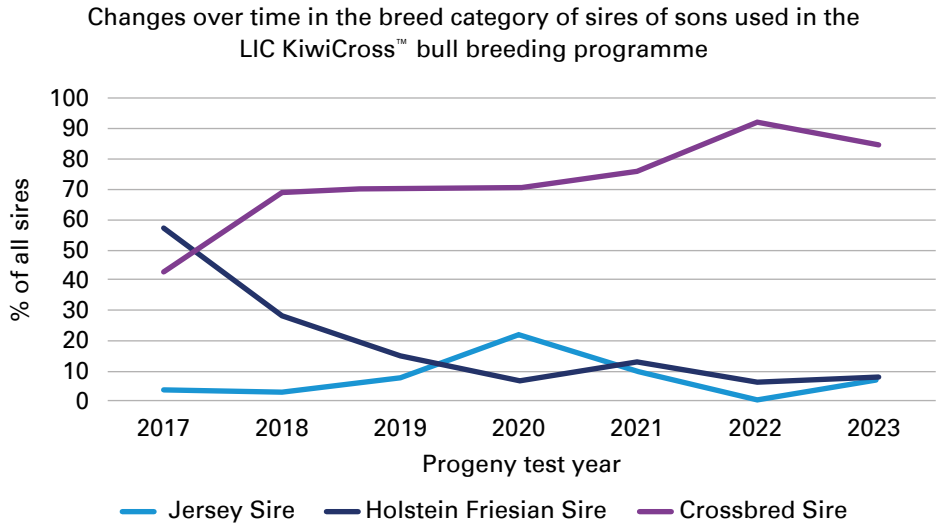
The LIC KiwiCross™ bull breeding programme now matches that of the HF in size, driven by market demand. In recent years LIC's SPS bulls number about 70 HF, 70 KiwiCross™ and 44 Jerseys. The crossbred programme can utilise bull sires across breeds without being as restricted by inbreeding or breed percentages as the purebred breeding programmes. Superior genetics emerging in the crossbred population are being utilised to accelerate genetic gain in the LIC KiwiCross™ breeding programme. The average BW of dams of the KiwiCross™ bulls is more than 20 BW points higher than dams of either of the parent breeds, (see Figure 2). Much of this is due to the selection intensity that can be applied, with crossbreds making up 60% of the cow population.

Figure 2. Average BW of bull dams in 2018-2022, and number of bulls progeny tested by breed. Source: LIC, 2023



On the bull-father side, crossbred sire usage in the breeding programme has increased over time with the emergence of genetically superior crossbred sires, (Figure 3).

Figure 3. Breed of sires of KiwiCross™ progeny-tested bulls, trend over time. Source LIC, 2023



The initial vision for the KiwiCross™ breeding scheme has proven correct, and farmers globally can now enjoy an elite bull offering, sourced from this expanding crossbred population. The future looks exciting for KiwiCross™ bulls!

GENIMEX VISITS NEW ZEALAND

The Jerseys seen in the photo is cows from a herd in the Taupo region of the north island of New Zealand. This herd is currently a month away from dry off and sitting at an average milk solid production of 300kg per cow. As a true System 1 (zero input 100% grazing) farm the Armer Farms Group focus is on profit per hectare. The Jersey cow suits their system as they are a smaller cow, that can walk the hills of the farms with ease, while keeping condition and maintaining production.

Genimex group in front of the LIC's Hall of Fame. It was great going through the years and seeing how many Hall of Famers have been used in South Africa. Left to right: Elizna Erasmus, Hendrik Bezuidenhout, Simon Alderson-Smith, Shawn Buckley, Britt Stanton, Chris Cloete and Johan Müller.

Zihan Mac Donald, a young trainee from South Africa milking on a farm that Simon Lavery is in partnership with near Christchurch on the South Island. One would have to go a long way in order to find a young man as enthusiastic and motivated as Zihan about life and dairy farming. Zihan's father, Johan, is a dairy manager on one of Simon Lavery's dairy operations here in South Africa.

"Milking from the inside rotary" at Rakaia Island Dairies.

Cow carrying the "Slick Gene" at the LIC Innovation Farm.

The Genimex group at the barn where research is being undertaken to measure feed intake and methane emission. Johan, Dr Joyce Voogt (LIC), Barry Allison (LIC), Shawn, Britt, Simon, Hendrik, Lorna McNaughton (Senior Scientist, LIC), Elizna and Chris.

The group discusses the progeny of KiwiCross™ sires that carry the "Slick Gene" at the LIC Innovation Farm. From left to right: Joel Riwhi, (Manager at the Innovation Farm), Chris Cloete, Shawn Buckley, Hendrik Bezuidenhout, Britt Stanton, Kapy Macown (LIC), Elizna Erasmus and Simon Alderson-Smith.

Much was said and there is considerable interest in the "Slick Genetics ". This is a very exciting development and can be of huge economic importance to dairy farmers in the near future. Bull semen of bulls with this specific gene, that will bread cows with significantly higher heat resistance, will be available soon. Cattle carrying the Slick Gene have very short hair and are polled. Bulls carrying the "Slick Gene" are planned to be released in 2029.

Shawn Buckley, Johan Müller, David Peden (Contract Milker for the Armer Group), Colin Armer and Ken Bartlett discussing the Spring Rotational planner and deferred grazing.

Scott Armer, CEO of the Armer Group discusses changes implemented on staff safety.

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