- THE GENIMEX JOURNAL -

MILK & HONEY

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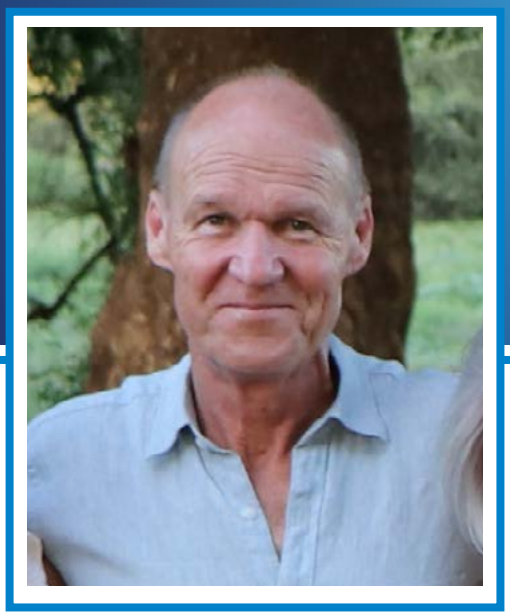


Foreword

BY CHRIS CLOETE

As we all stare 2023 straight in the eyes and wonder what challenges the year ahead will bring and how we are going to position ourselves to take on the challenges, turn them around and make a success of our businesses.

Allow me one moment to thank ALL our loyal clients that have supported us over the many years that Genimex has been in business. It is such a privilege to be in a position in the industry to have great clients and forward thinking and progressive suppliers.

Then I need to make special mention of the Genimex team of agents and staff, without whom the product would not end up in your flasks as efficiently and timeously as it does. Thank you to you all for driving the miles, talking the talk and doing the business.

At the start of each year we start selecting the bulls that will make up the sire teams for the year. This is always interesting and we search for that perfect bull, just like Priests Sierra, who is featured on page 5 of this Edition of Milk & Honey. With 150 000 daughters he deserves a place in the Hall of Fame at LIC.

We are also challenged with advising our two great suppliers as to the volumes of semen we require from each bull, sounds easy, but even though we think we know which will be the best sellers, the market only sends us clear signals as we start the selling trips. Fortunately we are able to adapt the requirements as time passes.

The series of workshops "SA DAIRY 2020" that we planned for April 2020 had to be postponed due to the Covid pandemic, I am very pleased to advise that we are back on track with these for April 2023. Please see the back cover for more details on dates and speakers. What an incredible team of speakers.

It is very fortunate that David Chin committed to presenting at the 2020 workshops that were postponed. So he could not refuse my invitation to present this year. David is now CEO of LIC and a great speaker.

David is supported by Jane Kay who is a Principle Scientist at DairyNZ which is an industry funded research organisation. Jane's presentations will be based on methane mitigation and farming systems.

To round off the team of international speakers we will be welcoming Pete and Michelle Wichman. Pete and Michelle form a dynamic team and operate an 1200 cow unit for the Armer group (remember Colin and Dale Armer at the 2017 workshops) they are also involved in the management of seven other herds (employing 25 staff) within the Armer group. If you want to talk practical farming, use this opportunity to meet and talk to Pete and Michelle.

Then last, but not least, my very good friend and mentor Ken Bartlett will be out to assist with the hosting of the days. Ken has been assisting me with the planning and we all look forward to seeing Ken again.

Thanks to Joyce Voogt of LIC for her continued assistance with putting together this, the 18th Edition of Milk & Honey. Thanks must also go to Peter Larson of VikingGenetics, Johan Müller of Genimex and Elizna Erasmus for the two articles of her training period with VikingGenetics in Denmark. Elizna is off to New Zealand and Australia to further on her training.

A thanks also goes to DairyNZ for allowing me to use some of their articles.

When putting together a publication like this I try to find pertinent and interesting articles and I really hope you find this edition interesting and informative.

I do need to mention the article on page 13 which talks about Short Gestation Sires (SGL). Please note that these sires are to be used solely for the shortening of the gestation period to tighten the calving pattern and the progeny MUST NOT BE KEPT they will not be good cows. The shortening of the gestation period by some of these bulls can be as much as 13 days (The bulls which have a BV for SGL of -26 days) that is significant.

I will end off by asking the following pertinent question. In these trying times would it not be better to be milking the right kind of cows for your system rather than daughters of "just get my cows in calf bulls"?

May 2023 be a successful year in your businesses and you and your families enjoy great health and happiness.

We look forward to seeing you at the Dairy 2020 workshops in April 2023. Save that date!

Chris Cloete

Jakob Lykke Voergaard, Senior Breeding Manager at VikingGenetics

VIKINGGENETICS
innovative breeding

WHAT IS THE DIFFERENCE BETWEEN POLLED AND SCURRED?

Can polled cows make a difference to your herd? The answer is “yes”, particularly if you want to save money on dehorning and achieve better animal welfare.

FOCUS ON POLLEDNESS

“Polled” is when an animal is missing a horn. The polled gene has been part of the breeding program in some cattle breeds, meaning many are polled.

Research shows one pair of genes controls the polled trait. Like human beings, cattle have two copies of most genes — one copy passes to the offspring.

“Heterozygotic polled” calves inherit a mother’s (dam’s) polled gene and a father’s (sire’s) horned gene. Conversely, **“homozygotic polled”** inherit two polled genes.

A DOMINANT GENE

Polled genes are dominant over horned genes. Animals that inherit the polled gene from one parent will be polled, providing **excellent opportunities** to breed polled animals quicker and in larger quantities.

Homozygotic polled (PP) mating with horned (hh) only produces polled animals. Animals with **one polled gene (P)** won’t have a horn.

A horned (hh) mating with heterozygotic polled (Ph) produces 50% polled offspring (on average). Two heterozygotic polled produce 75% polled offspring, of which one-third is homozygotic polled (PP). Homozygotic polled (PP) and heterozygotic (Ph) produce 100% polled offspring (half homozygotic polled).

SCURS ARE LESS COMMON ON COWS

Scurs are a type of horn and comes in various forms. It grows slower than a regular horn but not on the skull and are loose if held or moved.

There’s **no testing for scurs**, meaning skull and horn scans are necessary because some will crown but won’t move.

Scurs provide two main advantages to farmers:

- Bulls have more scurs than cows
- Polledness commonly affects scurs

We reduce the number of animals affected by scurs. **Scurs don’t affect homozygotic polled** but do affect a heterozygotic polled.

A pair of genes like polledness control scurs. Males and females inherit scurs from animals with two scurs (Sc-Sc). Animals with no scur genes (sc-sc) won’t inherit scurs but will be polled.

Animals with one scur gene and one normal (Sc-sc) is heterozygotic for scurs. In this case, the male will inherit scurs, while the female will be polled.

WHY ARE THERE POLLED BULLS WITH HORNS?

Most females will almost always be polled. Scurs is why some polled bulls have “horns”. When you see a picture of a polled bull with horns, those are scurs, and he can still produce polled offspring.

Polled bulls can’t have horns but can have scurs resembling horns. Polled bulls with scurs still give polled genes to 50% of their offspring (mostly polled but some with scurs)

VikingGenetics’ breeding programmes for **VikingHolstein, VikingRed** and **VikingJersey** focus on polledness. Dairy farmers can enjoy many benefits of polled genetics, including **animal welfare** and **cost reductions** when not investing in dehorning. M&H

GENETICALLY GIFTED BULL WITH OVER 150,000 DAUGHTERS RECEIVES HALL OF FAME HONOUR

A 12-year-old bull with over 150,000 daughters has been inducted into an elite animal 'Hall of Fame' for his outstanding contribution to dairy herd improvement in New Zealand.

Well known to farmers for fathering dairy cows with high production and good fertility, Priests Sierra is the latest artificial breeding bull to enter farmer-owned co-operative LIC's prestigious Hall of Fame, which dates back to the 1950s.

The respected accolade is reserved exclusively for bulls that have had, and will continue to have, a profound influence across the New Zealand dairy industry, and are in a class of their own.

LIC Livestock Selection Manager Simon Worth says Sierra has had a significant impact in helping to improve the production efficiency of New Zealand's national dairy herd.

"Breeding the best cows faster is key to helping farmers solve the challenge of being profitable and sustainable and it's elite bulls like Sierra that are helping farmers do exactly that."

Known for his high genetic merit (Breeding Worth), Priests Sierra was part of LIC's Premier Sires™ artificial breeding bull team for eight years - a record jointly held with just one other bull.

Worth says securing a place in one of the co-op's renowned Premier Sires bull teams is no easy feat and rightly so as the bulls that make up these teams are responsible for siring up to 75 per cent of New Zealand's national dairy herd.

"There's a lot of boxes a bull needs to tick to earn a spot in one of our teams and they can be quickly superseded by the next generation of elite young bulls from our breeding programme, so for Sierra to have a place on the team for eight years on the trot is extremely impressive."

Worth says Priests Sierra has been a favourite through the breeding programme, with eight of his sons also making the cut to join LIC's Premier Sires bull team.

"The offspring Sierra generates tick many boxes for farmers including more dollars in the bank and a lower environmental footprint.

"It is fantastic to see so many of his daughters, sons and grandsons continuing his legacy and contributing to the next generation too." M&H

Priests Sierra

Peter Larson, VikingGenetics

JERSEY NEWS

VIKINGGENETICS innovative breeding

FIVE HIGH RANKING DAUGHTER PROVEN BULLS, ALL WITH MORE THAN 500 DAUGHTERS IN MILK

If you prioritize high reliable bulls with lots of daughters in milk and classified, then have a closer look at the five bulls below. All bulls have more than 500 daughters in milk and VJ Gislev has nearly 2,000 daughters in milk. The group of daughter proven bulls offer a variety of pedigrees, and profiles. All five bulls also breed good production of protein and high protein percentages, as well as good udder health and type. Also note that all are A2A2, 100% pure Jersey and free of both JNS and JH1 – bulls that are easy to use! The five daughter proven bulls are all marketed with both sexed semen and conventional.

Name	Sire name	MGS name	MGDS name	Birth date	NTM	NTM type	Yield	Milk yield	Fat yield	Fat%	Protein yield	Prot%	Fem. fert.	Udder health	Other dis.	Claw health	Calf survival	Longevity	Persistence	Saved feed	Body	Feet and Legs	Udder	Milking speed	Temperament	JNS	JH1	aAa	KappaCasein	BetaCasein
VJ Hamlet	VJ Huus	VJ Hickey	DJ Zuma	6/25/2017	**22**	**OP**	109	107	103	95	114	105	118	111	106	115	106	103	119	104	107	104	113	92	103	Free	Free	165234	KC BB	BC A2A2
VJ Luxi	VJ Luck	VJ Hjort	DJ Beo	4/17/2018	**21**	**OP**	117	106	115	103	114	106	99	107	106	106	119	105	105	97	103	103	99	99	94	Free	Free	546	KC BB	BC A2A2
VJ Hays	VJ Haare	VJ Holmark	VJ Tudvad	7/13/2017	**20**	**OP**	106	103	104	100	106	104	116	111	98	115	109	102	98	92	117	110	116	113	95	Free	Free	243156	KC BB	BC A2A2
VJ Dandi	VJ Dau	VJ Jotur	DJ Izzy	8/14/2017	**13**	**OP**	110	102	111	105	106	104	100	108	103	98	99	93	92	97	116	95	114	91	105	Free	Free	426531	KC BB	BC A2A2
VJ Gislev	VJ Hihl	VJ Lure	Q Zik	2/1/2015	**11**	**OP**	118	113	115	96	118	100	95	107	94	64	85	108	102	90	110	97	101	106	122	Free	Free	516342	KC BB	BC A2A2

SEXED SEMEN STRATEGIES ARE TAKING OVER IN NORDIC COUNTRIES – WITH EXCEPTIONAL RESULTS

In Denmark the field performance for conception rates for sexed semen is followed closely for each produced semen batch. In this way, the performance for the individual bull semen ejaculates can be measured. Finally, and most importantly, the reproduction performance in the herds can be evaluated.

The data is carefully analyzed and used to optimize all processes and learn about factors affecting the conception rates. Non return rates show impressive results of using sexed semen on heifers and young cows, - even better than using conventional semen. See the table below, showing results of 122 000 inseminations with sexed semen on Jerseys during 2021.

	Sexed semen use		Non return rates at 56 days	
Sexed semen used on:	**No on inseminations**	**Sexed of total inseminations**	**Sexed semen**	**Conv. semen**
Heifers	57,195	89.3%	63.1%	60.6%
Cows in 1st lactation	27,544	68.2%	60.5%	57.5%
Cows in 2nd lactation	16,498	52.6%	57.2%	59.1%
Cows in later lactations	21.220	43.3%	56.1%	62.1%

By using a strategy with sexed Jersey semen on best females and Beef on the lowest ranking ones, you can ensure that the next generation of Jersey females will give maximum contribution to your genetic progress and that calves not used for replacement (Beef x Jersey) are getting a much higher value.

The sex rate on sexed semen is currently at 92 to 93.5% across dairy breeds. Danish and Norwegian Jersey farmers are in the lead worldwide when it comes to the use of sexed semen. In the Danish population 96% of the Jersey semen used is sexed and in Norway it is 99%.

This due to the fact that it is forbidden to cull newborn bull calves, a high demand for surplus heifers for sale (export) and the fact that a Beef x Jersey bull calf brings more profit than a pure-bred Jersey bull calf. (39% of all Jersey cows are pregnant with Beef).

TWO DAUGHTERS OF TOP BULLS, FROM THE ADELGAARD JERSEY HERD

ADELGAARD HAMLET HARMONY VG89

This beautiful young cow started her first lactation at 20 months of age. She has developed into an excellent example of how her father breeds. Her father is the high-ranking daughter proven VikingJersey bull, VJ Hamlet (VJ Huus x VJ Hickey).

Adelgaard Hamlet Harmony has just finalized her first 305-day lactation with 6,120 kg milk with impressive **6.6%** fat and **4.8%** protein.

The sire of Harmony, VJ Hamlet, is a breed leader for Persistency, Daughter fertility and Hoof health. Also note that he breeds high protein percentage/protein production and medium size daughters with excellent udders. Look forward to milking VJ Hamlet daughters, like Adelgaard Hamlet Harmony, - you will love working with these cows. VJ Hamlet now has more than 1,100 daughters in his production proof and 450 daughters are classified.

Adelgaard Hamlet Harmony VG89 – with extremely high percentages in her milk

ADELGAARD CASINO CARMA EX 92 – DAM OF VJ KASINO

Adelgaard Casino Carma combines excellent genes from the VikingJersey population (56%), the North American (40%) and the NZ Jersey population (4%). The sire is American Elliots Regency Casino (with a little Q Impuls in the pedigree) and the dam is Adelgaard Hoj Hosta VG89.

Adelgaard Casino Carma has finalized her first 305-day lactation with 7,410 kg milk with impressive 6.4% fat and 4.5% protein.

No doubt that Adelgaard Casino Carma has transmitted her good genes related to production, health and conformation to her son VJ Kasino (son of VJ Kantona). Many more offspring will come, as Carma has been flushed three times, producing 30 embryos in total.

VJ Kasino breeds high production of milk solids, as well as very good fertility, health and longevity. Type traits will make VJ Kasino extremely popular – look forward to work with, milk and show his excellent daughters!

Both VJ Hamlet and VJ Kasino are 100% Jersey, A2A2 and JH1/JNS Free

BREED FOR SAVED FEED AND SAVE COSTS

The Saved feed index has been fully implemented in NTM. The individual breeds has put different weight on Saved Feed in the NTM index (0.08 for Holstein, 0.13 for Red and 0.18 for Jersey). The reliability on the Saved feed index is still low (app. 30%) and expected to increase to app. 50% within the next couple of years. When reliability increases, the weight in the NTM index will be increased as well. In the Jersey breed the weight in NTM is high,

to make use of the correlation between saved feed & stature, to stop the unwanted increase in stature.

Feed cost is up to 70% of variable cost in dairy farming, so small improvements have huge value.

The Saved feed is a combination of Maintenance and Metabolic efficiency. The Metabolic efficiency is based on 3D camera images from the CFIT project. This part of the efficiency captures how well the feed is utilized in the cow. An efficient cow will convert a larger part of the energy consumed into milk and meat.

23 dairy herds have 3D cameras installed, and they supply photos/data all day, all year. The aim is to provide data on 10,000 cows per breed (app. 3,000 per breed today).

Some of the first results show that the difference in dry matter intake can be up to 2,000 kg feed (or 1,000 kg DM) between two cows in the same herd, at same production level! See table below, with data from one of the involved herds.

Adelgaard Casino Carma EX92 (in her second lactation), transmits excellent conformation

Cow	Lactation	Milk 0-305 days, kg	Feed Intake 0-305days, kg
1	1	10.190	6.749
2	1	10.097	5.407
3	4	11.469	7.614
4	4	11.864	5.662

REGISTRATION OF METHANE EMISSION WILL CONTRIBUTE TO DOCUMENTATION OF CARBON FOOTPRINT

In a new Danish research project, called ONIMIT, Methane emission will be registered in app. 50 herds with milking robots. Methane and CO^2 will be measured from the breath of the cows, when they are eating concentrate in the robot. (app. 80% of the Green House Gasses are in the breath of the cows).

First results show a high correlation between low feed intake and low emission and that higher milk production results in lower emission per kg milk produced.

An index will be developed, and Green House Gas emission will be part of selection criteria's, within the next 1-2 years. This will contribute to reducing the Carbon footprint from Dairy farming and reaching the Climate goals of the Dairy companies as well.

INCREASING DEMAND FOR POLLED GENETICS

Dehorning is costly, as it involves time, labor and in many countries also anesthesia and pain killer for the calves. To avoid the unwanted costs, many farmers have started to focus on removing the horns by using bulls carrying the hornless trait – polledness. The polled trait is controlled by one pair of genes. A calf gets one gene from each of its parents. This can be a gene for polledness or a gene for horns. It is a huge advantage that the polled gene is dominant over the horned gene. If an animal gets the polled gene from just one of the parents, the animal will be polled. This gives a great opportunity to increase the ration of polled animals.

Polled animals can have two different genotypes, Pp (heterozygous) and PP (homozygous). The aim is that all VikingGenetics bulls will be polled within the next 5-8 years. Currently 25 to 30% of all bought bulls across breeds, during the last 12 months, has been polled. Most of the bulls are marketed, but some are only used as sires of sons, as their genetic level (NTM) is lower than the NTM of the horned bulls. During the first 10 months of 2022, 29% of Holstein semen, 19% of Viking Red and 8% of Jersey semen was from polled bulls. Bear in mind that use of polled bulls at a lower genetic level (on NTM or SAINET) will cost genetic progress.

The international trend towards more polledness is not only driven by unwanted costs and extra work. In many countries animal welfare issues in relation to dehorning are driving the discussions. In the EU organic farmers have a dispensation to dehorn, but a ban for dehorning is expected within a few years.

INDEX FOR MAMMARY INCREASED FOR THE VIKING JERSEY BULLS

In the November 2022 proof run, the Viking Jersey breed introduced changes in weight on different udder traits in overall Mammary index. The changes were: more weight on rear udder height (higher attached), on teat thickness (thicker) and cancel the weight on udder balance (as we are close to optimum). These changes, along with a small change in evaluation method, resulted in a general increase in breeding values for Mammary, - and a better link between Index and the graphical illustrations of breeding values.

NEW JERSEY PEDIGREES COMING UP

First sons of VJ Jojo, VJ Cozy, VJ Highlan and VJ Hamulus has started to produce semen. Look forward to have these high ranking bulls available: VJ Jabra (VJ Jojo x VJ Lago) NTM +29, VJ Chicago (VJ Cozy x VJ Lucifer) NTM +26, VJ Hempel (VJ Highlan x VJ Hamlet) NTM +29 and VJ Husum (VJ Hamulus x VJ Powell) NTM +25. M&H

Check out the bulls at www.vikinggenetics.com/bull-search/dairy-1/vikingjersey-3

Johan Müller, Genimex

VJ HALEY GROEP. Die Haleys het veral beïndruk met hul uitstekende kapasiteit en goeie uiers

DEENSE GENETIKA BEÏNDRUK MET PRODUKSIE EN TIPE

Van Niekerk Boerdery presteer weereens op die Overberg Jersey Klub se jaarlikse kuddekompetisie

Die Overberg Jerseyklub kon vanjaar weer sy kuddekompetisie aanbied na 'n lang onderbreking weens die Covid 19 pandemie. Twaalf kuddes het vanjaar deelgeneem. Die kudde van die Van Niekerk broers en neefs het ouder gewoonte weer uitstekend gevaar. Vanjaar was hulle algeheel 2de. Willie en sy broer Eben en hul seuns, Wimpie en Niekie, bestuur die plaas wat hoofsaaklik bestaan uit die melk, graan en vrugte boerdery. Jaco Conradie is die kuddebestuurder.

Willie gebruik reeds meer as 25 jaar Deense bulle. Die 500 koei kudde spog met ongelooflike produksie data en handhaaf ook gemiddelde bottervet en proteien ontledings van meer as 5% en 4% onderskeidelik.

Die gemiddelde produksie tans is as volg:

456 Koeie / 6527 kg melk / 350.7 kg Bv /264.6 kg Prot- / 5.37 % Bv- / 4.05 % Prot.

Die Van Niekerks gebruik tans bulle soos VJ Splash, VJ Jojo, VJ Jake en VJ Kasino.

Tydens die kuddekompetisie het veral die Haley, Garant en Jocko groepe geweldig beïndruk.

Hieronder kan gemiddelde produksies van die verskillende bulle gesien word. Hoë produksies met veral uitstekende vaste stowwe, getuig van 'n doelgerigte teelprogram wat sterk klem plaas op hoë vastestof produksies, vrugbaarheid, uiergesondheid en funksionele bouvorm.

VJ GARANT GROEP – Die Garant dogters is groot en sterk met baie goed aangehegte uiers. Sy vooruieraanhegting indeks is 116 met meer as 160 dogters in produksie.

VJ Jocko groep. Jocko is ook 'n beproefde bul en spog met indekse van 124 vir vrugbaarheid (461 dogters) 112 vir liggaam, 116 vir bene en hoewe en 117 vir uier.

	Getal dogters	LAKT	PROD/DAG	Gemid bv %	Gemid prot %	Dae in melk
VJ QUINTANA	8	3 de	27.4	5.6	4.0	110
VJ RODME	4	3	24	5.82	4.2	55
VJ HILARIO	5	5	30.52	5.8	3.96	91
VJ HEREDOT	5	6	30.2	5.38	3.82	141
VJ HALEY	12	3	30	5.4	3.8	111
VJ ROLE	16	2	27	5.27	3.82	128
VJ HITMAN	14	2	28	5.12	3.81	78
VJ JOCKO	12	1	23.7	5.16	3.81	140
VJ HAYS	15	1	22.8	5.10	3.92	66
VJ GARANT	15	1	25.5	5.4	3.84	95
GEMIDDELD	106		27	5.4	3.9	100

Susanne Meier, Science lead, & Chris Burke, Senior scientist, DairyNZ

LIFTING THE VEIL ON THE FERTILITY BV

Does genetic selection for cow fertility result in better herd reproductive performance? Find out what we learned from a long-term comparison of animals with positive and negative Fertility Breeding Value, including a few surprising discoveries.

KEY RESEARCH FINDINGS

- The six-week in-calf rate was 30% greater in the positive (+5%) Fertility BV cows in their first and second lactations.
- The not-in-calf rate of negative (-5%) Fertility BV cows exceeded 40% each year, which meant we couldn't maintain this group beyond the second lactation.
- Half of the cows with negative Fertility BV didn't cycle again after calving and required reproductive interventions.
- Heifers with positive Fertility BV reached puberty three weeks earlier.
- We also discovered novel traits linked with genetic fertility.

Improving our sector's overall herd reproductive performance is a pressing matter. The 6-week in-calf rate is a good overall measure of performance and is used as the national benchmark, with the target being 78%. However, our sector average is only 68%, while the top 25% of herds have a 6-week-in-calf rate of more than 73%. To build more profitable and sustainable businesses, we need to get those rates higher.

DairyNZ's The InCalf book outlines eight key management areas for improving herd reproductive performance (Figure 1). These components contribute at different times of the annual cycle, and genetics is one component that can be used when farmers are making bull selection decisions. Remember, the benefits of better genetic fertility are cumulative and compounding across each crop of replacements.

IMPROVING GENETICS FOR FERTILITY

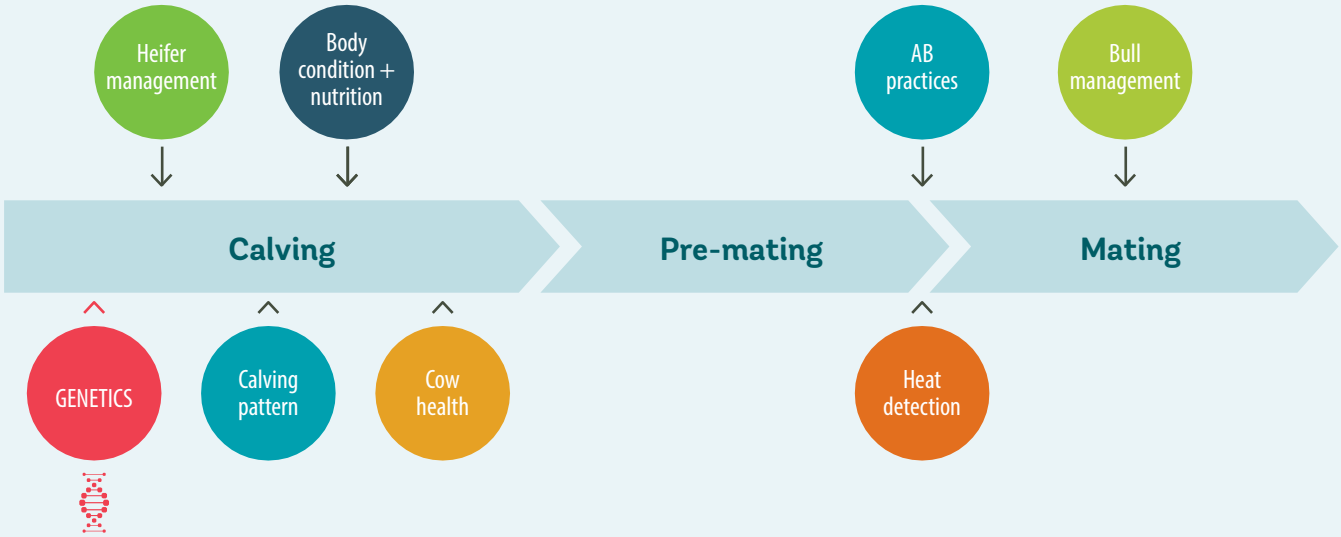
There's a significant economic reward from improving genetic fertility. That's why it's recognised in the Breeding Worth (BW) index, which ranks cows and bulls on their expected ability to breed profitable and efficient replacements.

The Fertility BV is one of nine components contributing to BW. It provides an objective measure of an animal's genetic merit for fertility. Before December 2021, the Fertility BV was estimated from whether an animal calved in the first 42 days of the herd's calving period (scored as 1) or later (scored as 0), using data from the second, third and fourth calvings. Mating data is also included, with cows scored as 1 if the animal was bred in the first 21 days of the mating period during lactations one, two and three; or scored as 0 if bred later.

In December 2021, two key changes to the fertility BV were implemented. Firstly, an animal's first calving (as a heifer) was included in her evaluation. Secondly, the old 1 or 0 scoring system was replaced with 'calving season day' (number of days between the herd's planned start of calving and a cow's calving date). This modification better rewards cows that calve earliest in the herd, while cows are more heavily penalised if they calve later, are culled for poor fertility, or do not calve in the next season.

Our national herd has struggled to become genetically more fertile. There was a downwards trend between 2000 and 2015, but the Fertility BV has gradually increased

Figure 1. Eight key management areas to improve herd reproductive performance



since 2015. Farmers can take advantage of this favourable trend by using sires with high BW and high Fertility BV. By doing so, you should expect to see better reproductive performance.

UNMASKING THE IMPACT OF FERTILITY BV

The sector needs to deliver continuous improvement of the Fertility BV, ensuring greater accuracy and a greater rate of gain. That's why, in 2014, we worked with some of our sector experts (NZAEL, LIC, CRV, AbacusBio and AgResearch) and farmers to generate a unique research herd of about 550 heifers with positive (+5%) and negative (-5%) Fertility BV.

To put the Fertility BV of these groups into context, the national average Fertility BV was -1.6% (standard deviation of +3.5%) for heifers born in 2015 based on NZAEL3.0 evaluations.

DIFFERENCES IN HEIFER PERFORMANCE

We didn't expect to see marked differences in reproductive measures of positive (POS) and negative (NEG) heifers because the Fertility BV uses data only from lactating cows (i.e., calving records and submission to artificial breeding records). We were surprised that the POS heifers achieved puberty three weeks earlier and at a much lower percentage of mature liveweight than the NEG heifers:

- Age at puberty: POS 358 days vs NEG 385 days.
- Liveweight at puberty: POS 274 kg vs NEG 294kg.
- Percentage of expected mature liveweight at puberty: POS 51% vs NEG 55%.

Consequently, 94% of the POS heifers had ovulated by the start of breeding, compared with 82% of the NEG heifers. The 3-week and 6-week in-calf rates were 13% and 9% greater in the POS compared with NEG heifers, with the POS heifers conceiving 3-4 days earlier than the NEG heifers (13 vs 16.6 days after the start of mating).

Whether age at puberty and timing of pregnancy in heifers is a helpful measure for accelerating Fertility BV gain is a question we're now addressing through large-scale studies.

Table 1. Calving rate for the positive and negative Fertility BV animals during their first and second calving

	POS Fertility BV	NEG Fertility BV
1st Calving		
3 week	82%	72%
6 week	93%	93%
9 week	97%	97%
2nd Calving		
3 week	62%	41%
6 week	82%	57%
9 week	96%	92%

CALVING PATTERNS IN LACTATIONS ONE AND TWO

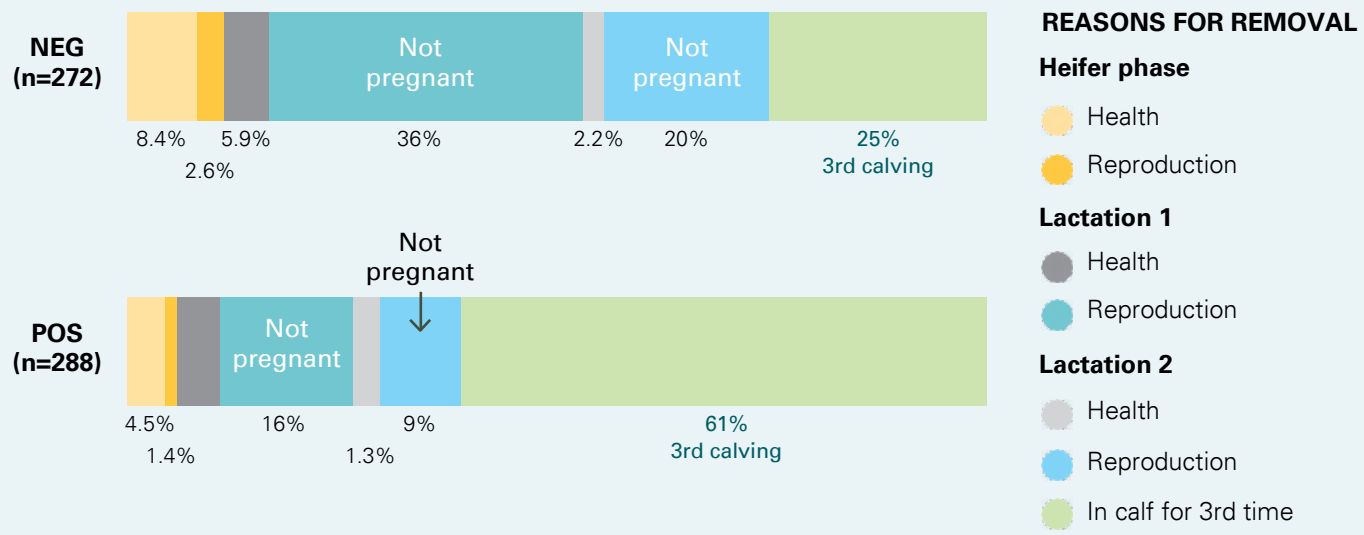
In lactation one, the POS cows calved, on average, four days earlier than the NEG cows. By lactation two, the difference was 12 days earlier. Hence, more POS animals calved within the first three weeks of seasonal calving during lactation one and two (Table 1). This is not surprising, as Fertility BV is based on cows' ability to re-calve during the first six weeks of their second lactation.

SUBMISSION RATES

In our research herd, submission rates were markedly different between the POS and NEG cows. The 3-week submission rates during lactations one and two were 87% and 88% in POS cows, compared with only 49% and 63% in NEG cows, respectively.

Calving pattern in the first lactation was not the cause of the poor submission rates for NEG cows. Instead, the poor submission rates were due to 46% of the NEG cows not cycling (anoestrus) in the first six weeks of mating,

Figure 2. Animal removal over four years (2015 heifer rearing to in calf for the 3rd time in 2019)



compared with only 5% of the POS cows. Furthermore, among the NEG cows that did cycle, their interval from calving to first oestrus was nine days longer than the POS cows that cycled. This delay in ovulation was seen in both lactations one and two.

The key finding here is that the ability of cows to resume cycling within a reasonable timeframe after calving (e.g., within six weeks) is likely to share a genetic link with the 6-week calving rate. So, measuring the time between a cow's calving and first heat may help improve the accuracy of the Fertility BV. We're currently investigating this possibility.

CONCEPTION AND PREGNANCY RATES

As we followed our research herd over the two seasons, we saw marked differences in the timing of conception and pregnancy rates between the POS and NEG animals. On average, the POS cows conceived 12 days earlier than the NEG cows. In lactations one and two, significantly more POS cows were pregnant by six weeks of artificial breeding:

- Lactation 1: POS 67% vs NEG 34%.
- Lactation 2: POS 74% vs NEG 44%.

By the end of breeding in lactations one and two, there was a 10% to 14% difference in final in-calf rates between POS and NEG cows. The high not-in-calf rates of the NEG cows resulted in a sizable percentage of this group being culled as non- pregnant each year (Figure 2).

These data support an argument for basing the Fertility BV on conception success as a more direct and earlier measure of fertility than re-calving data. Foetal-aged pregnancy testing is a routine practice on more than 4000 farms, so there are enough industry records to use this trait in genetic evaluation.

HEIFER AND COW SURVIVAL

Survivability of this trial herd through to the third calving (pregnant at the end of lactation two) was markedly different between the POS and NEG lines (Figure 2). Losses in the heifer groups were low, with 6% of the POS and 11% of the NEG heifers removed before their first calving.

However, only 25% of the NEG heifers survived to the point of being pregnant at the end of lactation two, compared with 61% of the POS heifers. The primary reason for culling was cows failing to conceive: the NEG cows had twice the removal rate of the POS cows (Figure 2).

WHAT NEXT FOR FERTILITY BV?

The results of this long-term study clearly show that genetic selection for cow fertility results in tangible differences in herd reproductive performance.

Importantly, we discovered novel traits linked with genetic fertility. For example, a cow's genetic merit for fertility affects her ability to start cycling post-calving and calve in the first six weeks of the next season. Also, earlier 'puberty' and better 'heifer reproductive outcomes' are associated with the Fertility BV and, therefore, are better and earlier predictors of cow fertility than current measures based upon mating and calving records during lactation.

Large-scale validation and development studies of the new fertility traits are currently underway. The findings are encouraging, although further work is required before we can include these traits (e.g., age at puberty) into routine evaluations.

Joyce Voogt, International Technical Manager, LIC

SHORT GESTATION SEMEN - A USEFUL TOOL TO TIGHTEN CALVING SPREAD

Short gestation length (SGL) semen provides a useful tool with a compelling value proposition for many dairy farmers. Getting the best out of it requires careful adherence to a few key principles.

The benefits of using shorter gestation length sires include:

- **More days in milk:** SGL solutions have a naturally shorter pregnancy length, giving up to 10 more early-season days in milk, with the increased revenue that generates.
- **More compact calving:** SGL can get calves on the ground up to 13 days earlier than normal gestation length bulls. For block calving herds, this is an effective way to compact your calving period and bring your late calving cows forward, giving a break between the end of calving and the start of AI.
- **More cows in calf:** Cows that calve early in a herd's calving period have more time to recover and cycle before their next mating season. This increases their chances of getting back in calf to AI and reduces empty rates in block calving herds.
- **More control with AI:** Extending your AI programme with SGL gives you the option to eliminate or reduce the costs and risks involved in using natural mating bulls after replacement semen AI, including lower calving difficulty risk.

The LIC short gestation length product range in South Africa includes SGL Dairy and SGL Hereford, each providing different revenue opportunities. Bespoke breeding and management strategies allow farmers to optimise the return for their own situation.

SGL DAIRY

- SGL Dairy gives more days in milk and post-calving recovery time with calves born around up to 13 days (SGL BV -26 days) earlier than progeny of a bull of BV 0. It provides a useful tool to bring the calving date of cows mated in the second half of the mating block forward.
- Calving difficulty BVs are favourable for SGL Dairy sires.
- A natural distribution of ± 10 days is still seen around expected calving date, as for other semen types. This occurs over and above of the shorter gestation length.
- SGL Dairy sires are KiwiCross™ (FxJ), so offspring are visually indistinguishable from those of high BW KiwiCross™ bulls from which replacements are bred.

Note: Confusion can occur in the calving paddock and mismatching of calf to dam is reported in many countries.

- **SGL Dairy is bred only for accomplishing short calving intervals; it is not effective or authorised for breeding replacement heifers. A plan should be in place to avoid keeping an SGL Dairy calf as a replacement.**

SGL HEREFORD

- LIC has worked alongside leading Hereford breeders, Shrimpton's Hill Herefords, who have developed easy calving and easily identifiable Hereford sires that reduce gestation length by an average of 3.5 days across dairy breeds.
- Suitable for rearing as dairy beef animals, their distinctive white face marking is readily recognised in the paddock, requiring no additional calving group management.

TIPS FOR USING SGL SEMEN

- Decide on the product best suited to your situation, including management options at mating and calving time.
- Identify cows who will benefit most from use of the SGL product and manage them to set them up for a high pregnancy rate e.g., use additional heat detection aids/strategies to maintain heat detection accuracy as AI progresses.
- Record all AI matings. Use early aged pregnancy testing to confirm cows in calf to SGL and calve SGL Dairy calves separately to the replacement calf mob at calving time. SGL Hereford calves should be easily identifiable.
- Clearly identify replacement calves immediately to avoid mix-ups in the calf shed.
- Carry out a DNA parentage verification test if there is any uncertainty about the sire.

With these plans in place the maximum value can be realised. Whether you wish to maximise days in milk, compact your calving and have more recovery time for late calving cows, or require a dairy beef calf to rear or sell, LIC SGL products provide another useful tool for South African dairy farmers. M&H

GETTING READY FOR THE MATING SEASON IS KEY TO GETTING GOOD RESULTS

SUCCESS WITH INSEMINATIONS

This is a three-part process involving:

- The farmer (heat detection)
- The technician (semen placement)
- The cow (cycling correctly/on heat).

Many factors help set up a cow for strong heats and mating success once in the milking herd. Early calving cows have more time to resume cycling post-calving and those meeting body condition score targets at calving have higher three-week submission rate and 6-week pregnancy rate.

EFFICIENT HEAT DETECTION

High levels of heat detection efficiency lead to better conception rates. The more cows you identify on heat and successfully mate, the higher the pregnancy rate will be. Taking time to train your team really pays off.

Two types of heat detection errors occur:

- Heats can be missed
- Heats can be falsely identified ie 'invented'.

The missed heat is the more costly error to the farmer as it results in 21 lost days in milk next season, later- born calves and less recovery time for the cow before the following mating period commences.

Cows with weak heats can be tricky to detect and heat detection aids can be a big help with finding these girls. Invented heats are less costly with no chance of conception, wasted semen, and as mating progresses, the risk of lost pregnancies when pregnant cows are remated. If you are unsure, look for additional signs of heat and at past mating dates. Either way, maintaining accurate heat detection throughout the whole mating period is important.

AI LOADING AND INSEMINATION

The success of your AI mating season starts at your AI tank. Correct semen handling procedures from tank to cow are critical for good conception rates. Your cows will never get in-calf if you compromise the semen, no matter how good your heat detection or insemination skills may be.

Remember insemination is a two- stage process:

- Guiding the AI gun to the entrance of the cervix
- Gently manipulating the cervix onto the AI Gun. Executing the insemination process efficiently reaps the rewards of all your hard work in getting the cow to that point.

RECORDS MONITORING AND REVIEW

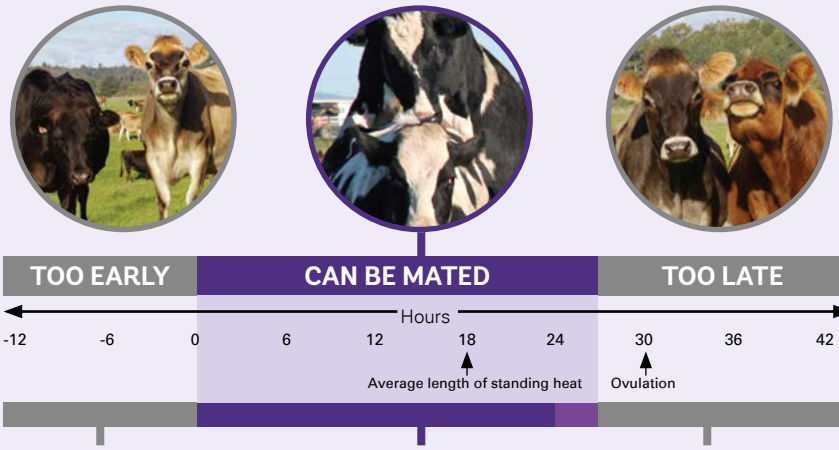
Record keeping throughout this season's mating will be key to accurately assessing your mating results and your ability to identify effective strategies and potential improvements for next season.

Accurately record all AI and natural mating details against each cow as soon as possible after mating, noting all the details on each semen straw including bull name, bull code and batch number.

LIC is always working on how it can help farmers make small improvements day in, day out, and we are always striving to deliver improvements on farm.

The DairyNZ KPI for 6 week in calf rates is 78%. Cows in a block calving herd are in a race against time to calve, resume cycling and get back in calf again within the first six weeks of mating, to remain a profitable animal within the herd. The question is, how do we best achieve this?

Cow behaviour and heat detection



On the surface, pre-mating heat checks may seem an arduous task, with added cost to your repro budget, but the benefits of pre-mating heat checks far outweigh any disadvantages associated with labour and expense.

Someone once told me it was easy to tell if a cow is bulling without the need of heat detection aids. In part, this is true, however my question to that person was how do you easily tell if the animal has not been bulling?

This is one of the biggest advantages of pre-mating heat checks, easily highlighting animals that have not resumed cycling post-partum. Identifying these animals after the first 3 weeks of mating, means they are far less likely to get in calf within the first six weeks.

However, identifying these animals before the planned start of mating means you have time to get them cycling and be served within the first six weeks of mating.

Now let's say it's day 10 of mating, cow number 125 comes into the dairy and a member of your staff is unsure of her heat. If her pre-mating heats are recorded, you can reference this in deciding whether to mate her or not (whether she falls within the 18- 24 day cycling window). This can be particularly helpful in spring calving herds experiencing inclement weather during mating where activity within the herd is reduced. Thus ensuring cows with weaker heats are detected and reducing semen wastage on cows not in heat.

Identifying cows that have cycled more than once prior to mating is useful in selecting appropriate candidates for sexed semen, to achieve better non- return rates.

Pre-mating detection gets staff into the right headspace for mating. It's an opportunity to train new staff in heat detection and insemination and reinforces mating protocols for your team. Come mating time, your staff's heat detection will be on-point, with heats and the associated 21 days in milk less likely to be missed.

It can be as easy as painting up all the cows to identify those that don't cycle. Put early energy into getting these cows on track – particularly with any intervention – and complete it early to reap the financial rewards and focus your staff ready for mating.

PRE-MATING BEST PRACTICE

Start early, at least 35 days (5 weeks) or more, prior to planned start of mating. Apply a tail paint and/or Scratch Patch/ Heat Patch Plus and observe heats. Repaint cows that have cycled with a secondary colour and note down her date seen in heat.

You can use different colours representing each week within the cycle to easily see if you are on target for 3-week submission rates. Use your on-farm software or a Whatsapp/ Messenger group to record heats.

Additional days in milk (days in oestrous cycle - 21 on average) **X** Production (kgMS) **X** Payout ($)

Using a mating chart is also an excellent tool as a pre-mating resource to record pre-mating heats. By recording premating heats through these tools it allows more accurate heat detection further into mating by having a point of reference to confirm a true or a false heat.

Talk to your local District Manager to find out more.

Identify the cows that have not cycled (still have the first coloured tail paint) 10 days prior to planned start of mating and implement your usual protocols for non- cycling cows, to get them mated early. If you have any concerns about not hitting submission rate targets, speak to your vet for advice and support on what you can do. (M&H)

Elizna Erasmus, Genimex

HERNING LANDSSKUET 2022 (Herning show 2022)

I had the privilege to join the Giskov-Petersen family at the annual Herning Landsskuet. After a 2 year break, due to the corona virus pandemic, the 2022 agricultural fair was truly a special experience.

With exhibitors from across the whole agricultural industry and animal breeders from all over Denmark it makes for a spectacular event attended by around 50 000 people.

Preparations on farm started about 3 weeks before the start of the show. All animals eligible for the show, are tested for diseases to ensure no animal is a biosecurity hazard. Halter training also starts, to make sure everyone is comfortable with leading the cows and all cows are relaxed while being lead.

In the week leading up to the show it is time to get the cows show ready, everyone is washed, clipped and trimmed to get them in tip top shape for the judging.

At the show grounds, preparations starts one week before the cows arrive to the show. In the barns where the animals will stay for the duration of the show, straw beds are prepared. The beds are made by rolling out bales of straw and loosening up the straw. After the first layer of straw, saw dust is sprinkled over the straw layer, everything is sprayed with water and then compacted with a tractor. These steps are repeated 3 times where after a last loose layer of straw is put on top. Edges are squared off and the beds are left to dry and solidify for the next week.

The arrival of the animals at the show grounds starts 4 days before the gates open for the public. From farms across the country around 1500 animals are brought to the town of Herning for the annual National Agricultural show.

Holsteins (BW)	320
Holsteins (R)	70
Viking Red	80
Jersey	108
Beef cattle	400 (16 breeds)
Horses	280
Sheep	100 (11 breeds)
Goats	40 (4 breeds)

As I have never had the opportunity to work "behind the scenes" at an animal show it was such an eye opener to see the amount of work that goes into the whole process.

The first day after the cows arrive at the barn where they will be staying for the week, they are loosely tied to a railing so that they can lie on the straw bedding with permanent access to feed and water.

One thing that never crossed my mind is that the dairy cows would have to be milked whilst at the show. So, every day the cows are milked at least once. The barn is equipped with a vacuum line running above each row of cows. Every farmer has their own milk bucket which is

connected to the vacuum line and the cows are milked right where they are standing. Milk from all the dairy cows is emptied into one bulk tank and collected by Arla (the main milk buyer in Denmark). Arla compensates the producers by supplying them feed for their animals for the duration of the show.

Milking of each cow is done at a very precise time that was calculated by Christian to ensure that the cows look at their best when they enter the showring, but also ensuring that the udders are not too full so as to make sure that milk is not leaking from the teats when the cow is in the show ring. The ability to calculate these times accurately is a result of observing the cows for weeks prior and knowing the cows well before taking them to the show. This was also a concept that I have never thought about, but the necessity makes perfect sense if you value cow comfort.

To care for the cows, there is accommodation available for all the exhibitors. This made it possible for days to start early and end late without the necessity to travel distances to be there.

Days started at 4:30 when all the cows are washed to get rid of any manure stains that might have occurred during the night. Whilst the cows are outside for their morning shower, the straw is cleaned from the night's faeces and dirty or wet straw is removed. A fresh layer of straw is also applied to the beds so when the cows return, they can enjoy clean dry beds. Old feed is emptied, and fresh feed and hay is supplied to each cow. After this "poop watch" starts. Working in shifts we sit and wait for signs that nature calls and all that I can say is that after a week at the Herning Landsskuet my ability to see when a cow is about to defecate or urinate is at such a level, I would be comfortable to add it to my CV, if that was a skill considered useful...

Adelgaard had 11 cows and one heifer entered in the show. After judging, all the cows Adelgaard scored above 23 points (the highest bracket to fall in), 4 cows won in their show groups, one cow and the heifer received a 2nd place in their groups, and 2 cows got the 3rd place in their groups.

After these above scores where awarded, top ranking cows had the opportunity to compete in further rounds to be crowned with the following category titles.

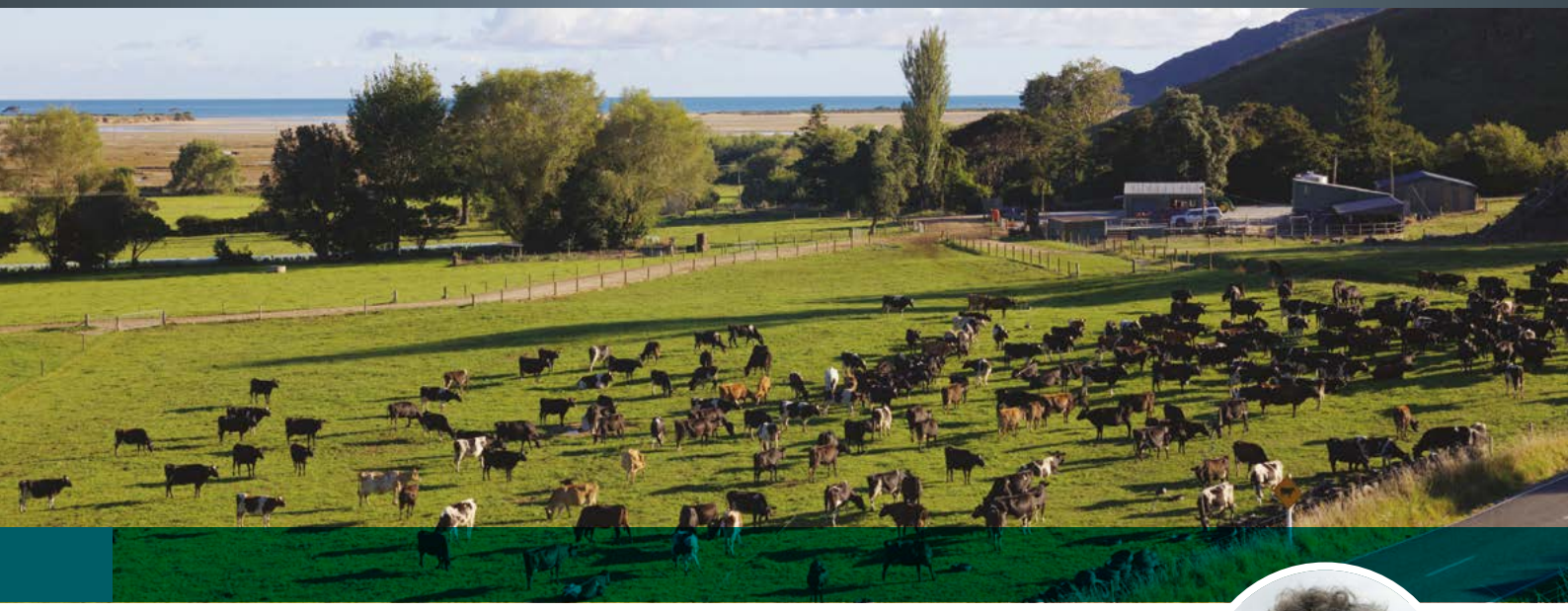
- Reserve jersey champion
- Super cow (judged on conformation and lifetime production)
- Best future cow (1st lactation cows entered the category at 2 months and only judged when they are in 1st lactation.)
- Best herd (based on a group of 3 cows 3+ lactation, 2nd lactation and 1st lactation cow)

Adelgaard (Vagn and Christian) also received the honour of being awarded the Master Breeder title for the 5th year running.

It was an absolute experience to witness the dedication these breeders have and the tangible passion they have for what they do. Working alongside everyone from Adelgaard was such an honour, and an experience I will cherish forever. M&H

Seppo Niskanen (VikingGenetics) Elizna Erasmus (Genimex) Peter Larson (VikingGenetics) and John Kelso (VikingGenetics)

Joyce Voogt, International Technical Manager, LIC



LIVEWEIGHT BACK IN THE SPOTLIGHT

Liveweight is back in the spotlight as recent enhancements to the New Zealand BW model remind us of its impact on farm profit.

Feed conversion efficiency reflects the efficiency of feed utilisation by animals for production, including meat or milk.

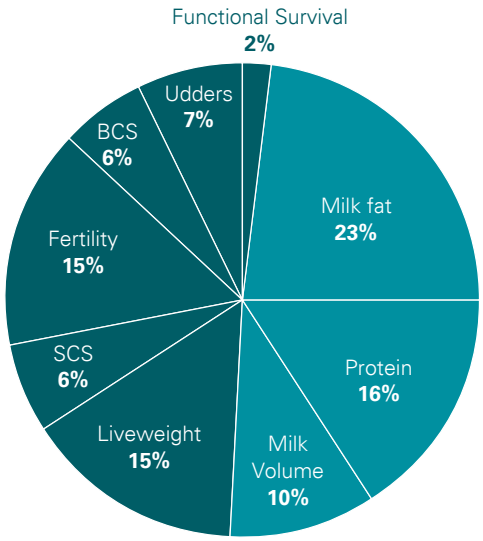
As feed costs rise, we need increasingly efficient cows to maintain profitability, whatever the feed type. It reminds us again of a popular metric for efficiency amongst dairy farmers - 'kilograms of milk solids per kilogram of liveweight', with the condition of concurrent good fertility. Within a herd there can be quite a range of production efficiency, so it is important to identify and breed the most efficient and profitable type of cow for the farm system. Liveweight needs to be a part of that equation.

Liveweight is a key factor in the production efficiency across all livestock sectors, as significant feed costs are associated with both growing and maintaining animals. In the context of dairy, it takes more feed to grow the larger cow to maturity, and more energy daily to maintain her. It takes 4.5 MJ ME/day to maintain an additional 50 kg of liveweight in mature dairy cows.

That equates to just over 0.4 kg of dry matter/day of 11 MJME pasture, or about 150kg DM per year, in annual running costs for the cow. The more expensive the feed, the more costly that difference will be.

The contribution of liveweight to the efficient conversion of feed to profit is demonstrated in the BW (Breeding Worth) trait emphasis graph, Figure 1.

Figure 1. Trait emphasis in BW, April 2022



Source: NZAEL, 2022

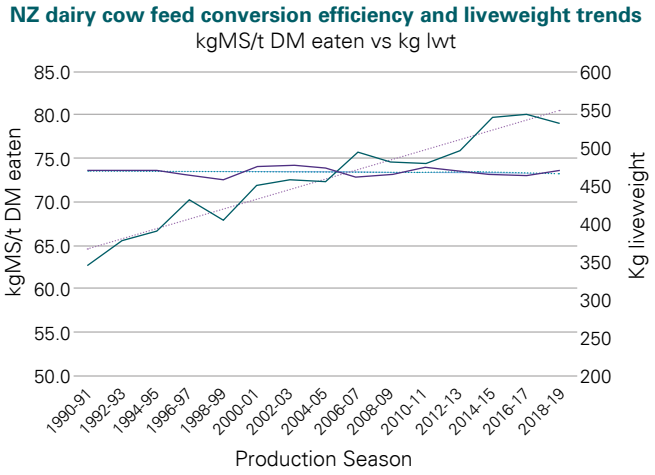
Maximising annual intake of energy from high quality pasture, requires maximising both pasture grown and eaten, and pasture quality. This takes great skill given the climatic challenges faced on farm! Farm systems also need a cow that can harvest the grass efficiently, convert it to optimal milk production for profit, and get back in calf quickly while doing so. New Zealand genetics are tried and tested in the pasture dominant, seasonal calving systems. Latest figures report that 82% of feed consumed per cow in NZ is grazed pasture, with crops

and harvested supplement comprising 10%, (mostly fodder beet and maize silage), and imported supplement less than 8%.

Production efficiency relates to how the animal partitions its feed. Each tonne of dry matter eaten is partitioned into grazing, walking, growth, condition gain, lactation, pregnancy, and body maintenance.

Figure 2 shows the increasing efficiency of milk solids production in New Zealand per cow, per tonne of dry matter eaten, while liveweight BVs remain relatively static

Figure 2. FCE and cow liveweight breeding value trends in New Zealand



Source: MPI Technical Paper no: 2021/04 & NZAEL

Liveweight also relates to environmental efficiency, as seen in LIC's HoofPrint™ model for methane efficiency. Heavier liveweight BV animals perform more poorly on both methane and production efficiency (kgMS/kgLwt) in the model. Heavier animals need to consume more energy each day to be equally efficient because have more liveweight to maintain and must produce proportionately more outputs to compete on a kilo for kilo basis. Ideally, that intake should be from pasture if that is the cheapest high-quality feed available. Feed intakes do reach a limit in pasture-fed systems however, with 400 kg Jerseys on average, being able to eat about 4% of their liveweight (16kg) and 550 kg Friesians about 3.3% (18kg), as good quality grass. Larger cows find it harder to keep increasing pasture intakes to support increased production without receiving additional concentrate feed. Concentrates don't come cheap. Within a herd there will be a range of cow efficiencies; some larger cows may be highly efficient producers, but this may come at a higher feed cost.

Table 1. Relationship between genetic estimates for HoofPrint™ methane efficiency rating, liveweight and milk production efficiency in NZ dairy AI bulls LIC (2020)

Methane HoofPrint® Index Rating	Average Liveweight (ext. mature)	MS/kg Lwt
1	564	0.68
2	570	0.72
3	548	0.76
4	528	0.8
5	523	0.83
6	504	0.87
7	487	0.9
8	472	0.93
9	466	0.95
10	457	0.98

CHANGES TO LIVEWEIGHT MODEL IMPROVE ACCURACY OF LIVEWEIGHT ESTIMATIONS

In April 2022, liveweight model enhancements moved to using only static weights, which improved the accuracy of mature liveweight estimations, lifting heritability to 63%. This moved Friesian and Jersey average gBV differentials closer together. Friesians saw a 4kg drop in average liveweight BV, Crossbreds a lift of 2 kg, while Jerseys and Ayrshires saw a lift of 6kg and 15 kg respectively.

Overall, the BV averages remain similar, with some individual bull re-ranking. The model changes had the effect of increasing the effective emphasis of liveweight in BW.

Dam of 518038 Werders Premonition. Liveweight BV -26kg. Ext mature lwt 474kg. Production as 6-year-old, 617 kgMS = 1.3 kgMS/kgLwt

At times when fuel prices are high, it makes sense to run the highest performing, most fuel-efficient fleet of vehicles. The same principle applies on farm; 'kilograms of milk solids per kilogram of liveweight' is a useful metric to compare cows within your herd for efficiency.

Cow bodyweight and milk recording data can give valuable insights on the most efficient type of cow.

With the optimally efficient cow on farm and efficient production and harvest of pasture, farmers are better positioned to weather any storms current international uncertainty may bring to milk price.

Elizna Erasmus, Genimex

MY TRAINING PERIOD WITH VIKINGGENETICS ON 3 FARMS IN DENMARK

After a long wait, the time had finally come to experience dairy farming in Denmark. My journey started at Sandagergaard Holsteins, a Holstein farm near Skals, a little town in Northern Jutland.

The Forum family together with the Herdsman Kim Hjortholm and 8 Lely Milking Robots, milk and manage a Holstein herd of 450 cows in milk. Every cow wears a transponder which transmits important information about the cow and is used to manage them efficiently.

The herd is on full TMR and in barns throughout the whole year. The main barns where the milking groups are kept are equipped with sand beds, at least 1 bed/cow with enough feeding space for every cow at the feeding table. Dry cows are kept in a separate barn, with full straw floor (no individual beds), close-up cows are moved into the milking barn, still in a straw pen where they calve and then can immediately be moved to the milking robot to be milked for colostrum. The calves are taken to the calf barn where they are individually penned for about a month before they are moved to bigger groups. After exiting the calf barn, heifers are kept in the heifer barn where they are inseminated at 12 months.

The breeding plan at Sandagergaard focuses on health and longevity, genetic improvement is sped up by using Sexed Semen as well as beef on dairy as part of their mating strategy. Selective breeding with genetically superior bulls and cows has ensured that Sandagergaard Holsteins are in the top of the Holstein population in Denmark. Herd average is 13 900kg of milk per lactation, with a fat and protein content of 3,76% and 3,54% respectively resulting in a total solid production of 1 014,5kg per lactation.

My next stop was Adelgaard Jerseys, a jersey farm on the west coast of Jutland near Skjern. Adelgaard is managed by father and son pair Vagn and Christian Peterson, with help from 3 permanent employees they milk 270 jersey cows twice a day in a 32 point rotary. The rotary uses a SAC milking system, and data of each cow is collected by means of a RFID ear tag. Data collected is recorded on the National recording system.

The Adelgaard Jerseys are housed year-round. The barns are fitted with sand beds, and the cows are fed TMR on feeding tables running down the middle of the barn. Dry cows are taken from the milking herd at around 65 days from calving day and kept in a separate section, still on sand beds in the same barn as the milking groups. Close to calving the cows are moved to a straw pen where they stay until calving.

Calf management and housing is very similar to that of Sandagergaard, except for the management of the older weaned heifers that are moved to grass paddocks from around 6 months to insemination age. After insemination they stay in the heifer barn.

Christiaan runs a strict breeding program developed through cow classification and genomic data from all the cows and heifers. Sexed semen is used on the best cows and heifers in the herd, and beef semen on the less desirable cows. The heifers that are not used as replacement heifers for the herd, are sold to the export market.

Adelgaard has a flushing contract with VikingGenetics and cows used for flushing are inseminated with conventional semen in the hopes of breeding a bull that can be used by VikingGenetics in their bull line-up.

Strict breeding standards ensures that exceptional cows are bred, and careful selection of replacements ensures that the quality of the animals in the herd are at top level, in production, health, fertility and conformation. The average production of the Adelgaard cows is 8409kg per lactation. With a protein and fat percentage of 4,33% and 6,10% respectively, a total solid content of 859kg/Lactation.

HOW INSEMINATION IS MANAGED

- In the first 2 x 21-day cycles of the breeding season all cows are inseminated with jersey semen.
- The top 10% of cows and heifers, selected through genomic testing, are mated with conventional jersey semen.
- In the 3rd (and last) 21-day cycle of insemination, all cows still coming into heat will be inseminated with conventional Angus semen.
- After this 3rd cycle all cows should be inseminated and pregnant, but for extra security pick up bulls are placed with the cows for the remainder of the year.

My stop for the final 2 months was at Saslbjerggaard Jerseys, a farm near Lundby in eastern Shealland. Søren Madsen produces organic A2 jersey milk in a seasonal calving breeding system. The 830 Salsbjerggaard Jerseys are milked 3 times a day in a 32-point swing around milking parlour.

After morning milking, the cows are let out to the fields. They stay on the fields, with a grass and clover mixture until the afternoon milking after which they return to the barns and have access to feed for the remainder of the day. As with the other farms I've visited, all the cows have individual sand beds. The floors of the barns are scraped 3 times a day, when the cows are being milked. Heifers are kept in the heifer barn, or on grass before and after the breeding season. The heifer barn is equipped with straw beds, and for the time they are not on grass they are fed TMR in the barn.

Calving starts at the beginning of May. Calves are taken from the cows 24h after they are born. Unlike the first two farms, calves are housed in calf huts in groups of up to 20. They are moved to bigger groups after 6 weeks and are weaned at 3 months. After all the calves are weaned, they are moved to grass. The time they spend on grass will be dependent on the amount of grass left this late in the season.

Insemination of cows starts from 26 August through to 3 November. Along with the block calving mating strategy, Søren uses the sexed semen and beef on dairy breeding strategy in his herd. This ensures that he gets enough replacements for the following season, and it also helps to eliminate genetics of undesirable cows from the herd. All jersey heifers are genotyped to ensure heifers that are kept have ideal characteristics to fit as cows in the system. The bull calves are all raised, some used as pick up breeder bulls and the rest are castrated and raised for the slaughter market with the beef cross calves.

Cows are dried off in groups at around 65 days from calving, this ensures there is no complete interruption in milk supply.

Careful selection of cows specifically fit for the grazing system, ensures Salsbjerggaard has excellent production statistics with an average peak production of 8500L/lactation and a high solid yield of 5.65% fat and 4.10% protein.

My time on the three farms was all so different but an invaluable source of experience. In practically working with the cows and doing the "dirty work" I gained a skill set that would help me understand obstacles I will encounter in the field when working with South African farmers.

I would like to thank all the families that opened their homes for me during my stay in Denmark, and especially to Peter Larson from VikingGenetics who orchestrated my trip and selected the best farms for me to gain the experience I needed. M&H

Joyce Voogt, International Technical Manager, LIC

MEASURING DAIRY COW FERTILITY

Good dairy cow reproductive performance is important in all dairy systems and is a result of both genetic and non-genetic factors. Genetic fertility is one of eight key management areas that affect herd reproductive performance. Good management throughout the cow's lifetime allows farmers to get the best results from genetic fertility.

Different measures are used to assess reproductive performance around the world. Empty rate is commonly used by farmers and reports the final outcome of a breeding season. Although simple to calculate, it has serious limitations as it is impacted by mating length and gives no sense of the rate at which pregnancies were established nor of the number of inseminations used to establish each pregnancy.

To gain more insights into the breeding period and to create estimates of genetic fertility, more sophisticated phenotypes are used. Calving interval (CI) is one of the most widely reported internationally, see Figure 1. Others include calving rate by week 6, days open, days to conception, non-return rate, days to first insemination, conception rate, number of inseminations, 6-week in-calf rate and 100d in-calf rate.

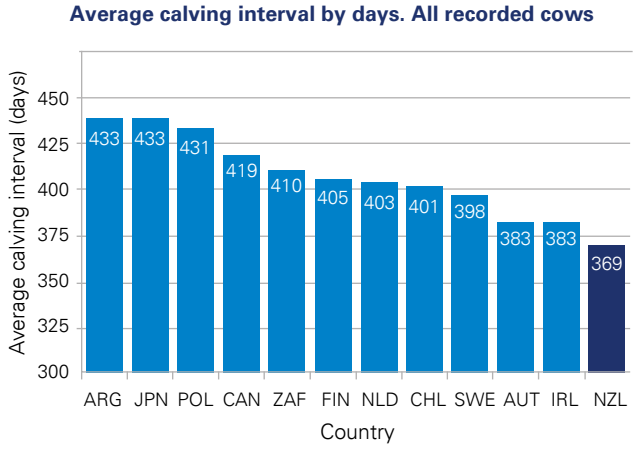
NZ ranks highly for CI, which is not surprising in a system where matching seasonal feed supply with demand is key to farm profitability. The close to 365-day calving interval reflects both genetic fertility and environmental factors, and is among the shortest in the world, remaining stable for many years.

While calving interval is used to calculate genetic merit for fertility in some countries it has serious limitations in block calving systems, where the highly valued early-calved cow is penalised simply because she is held open until mating start date for the whole herd.

In seasonal block-calving systems, the earlier a cow calves within the calving block the better her subsequent reproductive performance will be and the more profitable she will be, generally enjoying a longer lactation.

For this reason, NZ instead considers the point in the first 42-day period that the cow calves, thereby rewarding the earlier calved cow, reporting genetic fertility as the percentage of daughters calving by 42 days into the calving block (CR42) compared to the genetic base reference of 0.

Figure 1. Calving interval by country (ICAR stats 2017-2018, accessed 17.3.2022)



Source: ICAR statistics 2017/18

BREEDING FOR FERTILITY

The NZ national genetic merit index (Breeding Worth) puts a 15% weighting on fertility. On top of this, LIC puts additional emphasis on fertility by using performance and genetic merit thresholds for bulls and dams in its breeding scheme and for bulls marketed.

By selecting a bull team whose average fertility BV exceeds that of the herd, genetic progress is made. Some farmers refine this to an individual cow level. Remember to look at reliability as well as the Fertility BV. Initially the BV is based on ancestry and genomic information, then bull fertility BV reliabilities increase once daughters are in lactation, have been mated and calved in consecutive years.

NZ research also suggests that bottom quartile reproductive performance herds see more benefit from using high Fertility BV bulls than average or top quartile herds. This reinforces the importance of working on management and breeding simultaneously.

Selection pressure on the female side is also significant and estimated to contribute 30% to rates of genetic gain in New Zealand, where most cows that fail to conceive are culled. This helps remove low fertility strains from the national herd.

HOW FERTILE ARE NZ COWS?

NZ cow phenotypic reproductive performance is high by international standards, as seen with a national average calving interval of 369 days. In 2020, results from over 2.3M cows in 4492 herds with detailed reproductive reporting in MINDA™ showed:

- on average NZ spring calving herds had 84% of cows calved down by 42 days from the planned start of calving, (Ireland = 67% in 2021).
- conception rate (pregnancy success rate to an artificial insemination) averaged 54%, with the top 25% of farmers achieving 60%.
- on average around 68% of all spring-calving cows were back in calf within the first 6 weeks of the following mating period. In 2018, the top quartile of herds on reproductive performance averaged 77% of the herd pregnant by week 6 of mating.
- It is important to note that these figures exclude yearling heifers. Some countries include yearling heifer results in figures quoted for 6-week pregnancy rate.
- most of NZ heifers first calve down between 22-25 months of age, due to the seasonal nature of the industry. Ireland by comparison had 74% calved by 24-26 months in 2021. M&H

READING NZ FEMALE FERTILITY - CR 42 (CALVING RATE 42)

The NZ female fertility breeding value is expressed as CR 42

- CR42 is the % of a bull's daughters expected to calve within the first 42 days from the planned start of calving, compared to the genetic reference set at 0.

The bull whose daughters calve and cycle early within their contemporary group has a higher fertility BV than the bull whose daughters calve and cycle later or do not re-calve at all.

Half a bull's Fertility BV is passed on to his daughters. A bull with Fertility BV +6 is predicted to have 3% more of his daughters calving in the first 42 days of their calving block each year than the daughters of a bull with Fertility BV 0.

7 CONTRIBUTING TRAITS

CR 42 uses 7 traits over the first 4 lactations.

Calving season day, (CSD), relates to her day of calving within the block in each of her first 4 lactations

- ***CSD*** *0,1,2 and 3*

Mating information from the first 3 lactations contributes. PM21 is the percentage of cows presented for mating by day 21 from the start of the mating block

- ***PM21*** *1,2 and 3*

GLOBAL SHIFT IN TOTAL MERIT INDEXES

VIKINGGENETICS innovative breeding

Cow wellbeing and profitability of your dairy farm go hand in hand. The demand for animal health and welfare continues to grow across the dairy industry. And this focus is reflected in the development of total merit indexes across many countries.

Compared to just 25 years ago, the various traits grouped together under the category "**Health, Reproduction and Longevity**" are now given a significantly higher weighting in the formulas of all major total merit indexes.

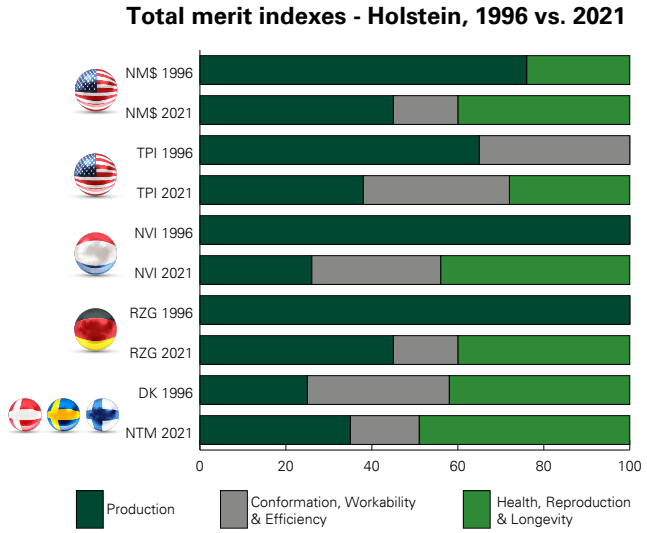
In the Nordic Total Merit Index (NTM), these traits have a combined weight of 49%, the highest among all major total merit indexes for the Holstein breed.

Traits beyond production and conformation are becoming more important to cattle breeders. To ensure profitable milk production, breeding for improved health, reproduction and efficiency will be the way of the future.

Fortunately, VikingGenetics has the genes you'll need to build a **profitable and sustainable business** – one that's able to satisfy the world's many environmental and ethical concerns.

With **science-based genetics** on your side, you'll be able to meet the growing demands of milk and meat processors, retailers, authorities and consumers. And we'll make sure you can confidently answer any questions about how milk and meat are produced on your farm.

DEVELOPMENT IN THE MAJOR TOTAL MERIT INDEXES - HOLSTEIN, 1996-2021



NORDIC TOTAL MERIT INDEX – A POWERFUL TOOL FOR DAIRY FARMERS

VikingGenetics has always been a pioneering spirit in the world of cattle breeding. We care deeply about sustainable dairy production. We are committed to a world where natural, healthy animals exist alongside happy, prosperous farmers. And we feel a profound sense of responsibility to keep people, animals and the environment in focus.

We first realised that **breeding for health** was possible back in the 1980s, and since then our breeding programmes have always balanced health with production traits. And we base it all on extensive, **real-world data** from thousands of Nordic dairy farmers. Simply put, we use science to express our humanity.

BIG DATA – THE SECRET TO SUCCESS

The secret to our success at **breeding for improved health and efficiency** is big data. Nordic dairy farmers have long been committed to providing information on their herds to be used for the benefit of all dairy farmers in creating reliable breeding values.

In addition to dairy farmers, data is collected by veterinarians, milk labs, artificial insemination technicians, hoof trimmers, slaughterhouses, classifiers, and just about every other stakeholder. And it's all sent to the same database.

What's more, a massive 90% of cows in Denmark, Sweden and Finland are registered for health traits and thus contribute to the data. The network spans various production systems at all management levels, rather than specifically selected herds, and this ensures the **remarkable reliability of our breeding values**.

In short, we turn big data into accurate and reliable breeding programmes. By choosing VikingGenetics as your genetics partner, you benefit from decades of research and the very latest innovations. M&H

VIKINGGENETICS
innovative breeding

"In short, the drugs we use to treat certain diseases are just not working anymore."

THE AGE OF ANTIBIOTICS IS COMING TO AN END

The improper use of antibiotics is leading to more resistant strains of bacteria. This makes certain diseases much harder to treat. To prevent the evolution and spread of antibiotic resistance, we need to act together on a global scale.

SCIENCE-BASED GENETICS IS THE SOLUTION

With science-based genetics, we can help you minimise the need for antibiotics. And you'll be able to rest assured that you're delivering safe, high-quality dairy and meat products to help feed the world's growing population.

"Improved health, greater reproductive success, higher yields of milk and solids – these are realistic goals."

A CORNERSTONE OF MEDICINE IS CRUMBLING

Since the discovery of penicillin in 1928, antibiotics have become a cornerstone of modern medicine. However, the persistent misuse of antibiotics in both human and animal healthcare systems has led to the evolution and spread of antibiotic resistance.

In short, the drugs we use to treat certain diseases are just not working anymore.

STUDY FINDS NORDIC COUNTRIES USE LEAST ANTIBIOTICS

The European Medicines Agency (EMA) assessed 31 European countries between 2019 and 2020. The data revealed that Norway, Sweden, Denmark and Finland are the countries with by far the lowest use of antibiotics in livestock production.

It's no coincidence that VikingGenetics supplies a 90% share of the market in this region.

BREED FOR STRONGER RESISTANCE TO DISEASES

Future-friendly dairy farming is not possible without healthy, robust, fertile cows. And breeding for trouble-free cows that deliver high lifetime production value is the foundation of a sustainable and profitable dairy business.

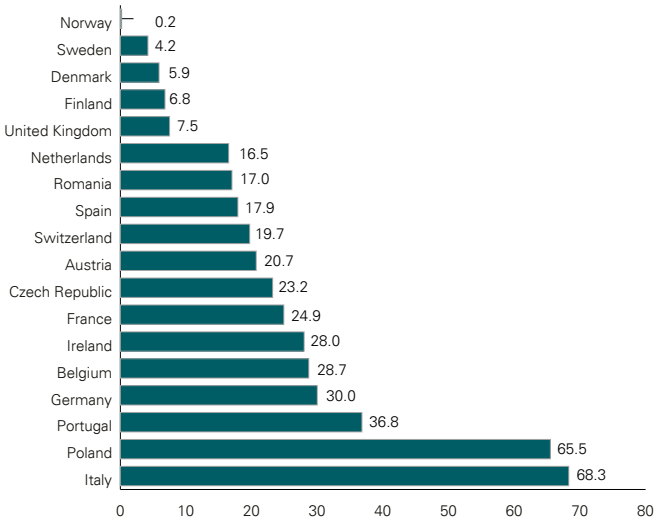
But is it even possible to improve the health of livestock, and therefore animal welfare, while also maintaining high production levels?

There is an inverse correlation between the frequency of disease and lifetime production. Simply put, less disease means greater production. So, yes, it's certainly possible.

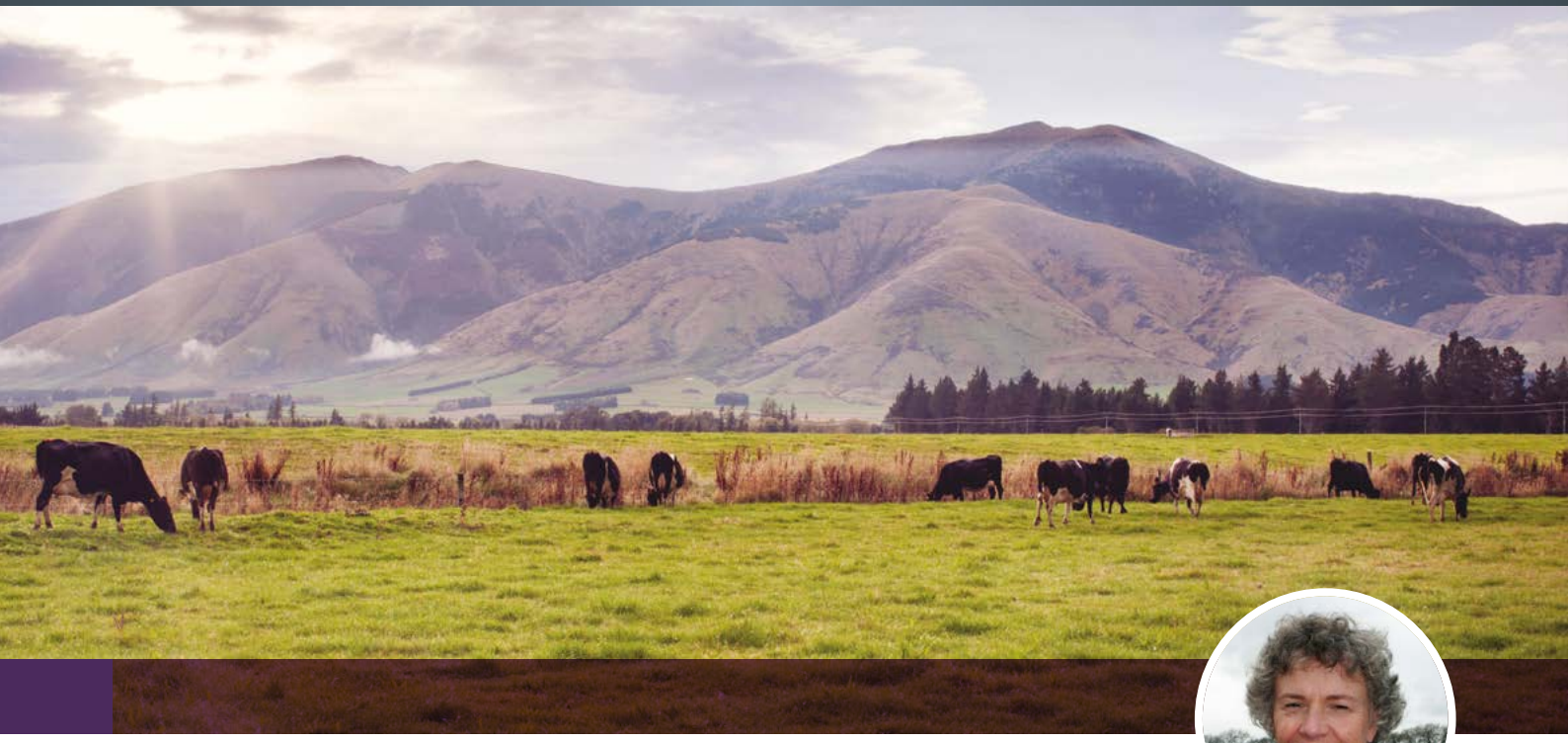
CHOOSE VIKINGGENETICS FOR A BALANCED BREEDING APPROACH

No matter what production system you use, with VikingHolstein, VikingJersey and VikingRed, you can achieve greater efficiency and reduce your costs by breeding for stronger resistance to diseases.

Improved health, greater reproductive success, higher yields of milk and solids – with a balanced breeding approach, these are realistic goals. M&H



Joyce Voogt, International Technical Manager, LIC



LOOKING AT LONGEVITY

Long-lived, highly productive cows constitute an ideal herd for dairy farmers all over the world.

Good cow longevity delivers financial, social and environmental benefits on farm. With high fertility, longevity and productivity, lifetime yield and profit can be maximised through lower replacement rates, increased stock sales, and more room for discretionary culling. On top of the gains in herd quality, we should mention the immense sense of satisfaction gained from working with great cows for many years.

WHAT CONTRIBUTES TO COW LONGEVITY?

Longevity is complex; the result of a mix of genetic, environmental and management factors.

It varies from farm to farm, so understanding the reasons for removal from the herd is a good starting point when trying to increase cow longevity. It can vary between cow groups within herds, across herds, farm systems or countries. Within herds, issues impacting longevity may include production, health or functional traits.

Recent research[1] into cow longevity in New Zealand revealed the following insights:

- Cow longevity in herds is high by international standards, averaging over 4.5 lactations/cow.
- Herd life in NZ showed 'a small but increasing linear trend over time'[1]
- Mortality rate is low (2.1%) and not increasing, in contrast to other modern dairying countries. This could, in part, be due to the outdoor farming systems and the high proportion of Friesian x Jersey cross animals.
- Annual replacement rate is about 20%. Of the cows replaced, the study classified 20-40% as discretionary culls and 60-80% as involuntary. Top reasons for involuntary culls included reproduction (37%), health disorders (31%) and udder health (11%).

HOW CAN FARMERS BOOST COW LONGEVITY?

Genetics pays a part, but heritability of longevity is low with additive genetics explaining <1% of the variation seen. Both management and breeding strategies are required to increase herd life.

On the breeding side, strategies include using sires with high genetic merit for contributing traits, crossbreeding for an immediate longevity boost, mating plans to minimise inbreeding depression, and genomic evaluation for more reliable longevity estimations.

1 Compton, (2018), 2.McParland et. al (2007),

On the management side, important focus areas include calf and heifer rearing, animal health, nutrition and body condition score, and calving and breeding period management.

BREEDING STRATEGIES:

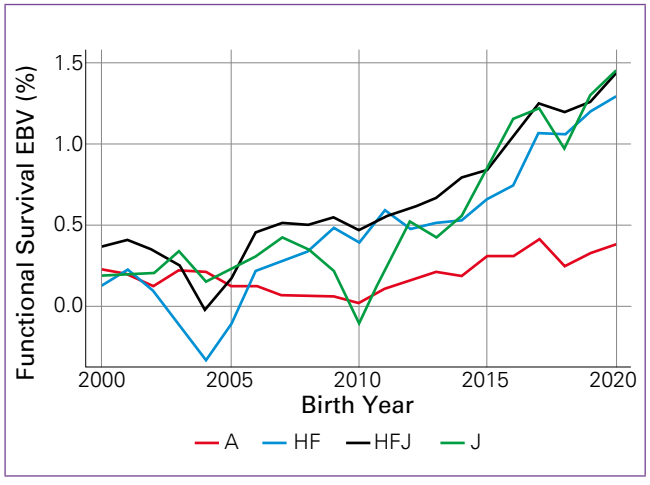
1. Use high genetic merit sires:

BW includes udders, somatic cell score, production and fertility traits, all of which are important contributors to cow survival. The index also catches other contributing traits to cow survival through a trait called **Functional Survival (FS)[2].** It estimates survival for reasons other than fertility or production and measures the relative percentage of cows surviving from one lactation to the next compared to the genetic base of 0. Functional survival gets a 2% weighting in Breeding Worth (BW).

Survival, by definition, is a late-expressed trait. To help provide useful information early in a bull's proof predictor traits are used. The four predictor traits which were shown to have the strongest relationship to survival are used: Milking Speed, Body Condition Score (BCS), Rear Legs and Udder Overall. Milking speed and BCS are more important predictors of early herd-life survival, while legs and udder are more important for survival in later life. As daughter survival data flows in, reliance on predictor traits in the bull proof reduces.

Pleasingly, NZ cows are trending strongly positively for Functional Survival BV in HF, Crossbred and Jersey breeds.

Functional Survival Genetic Trends, NZ Cows



(Source NZAEL, 1/12/2022)

2. Hybrid vigour boost with crossbreeding:

Crossbreeding brings together the complementary traits from the parent breeds and a performance boost from heterosis. It notably improves fertility and longevity as well as production, and the crossbred is now the most common dairy cow in New Zealand.

The first cross daughter of a NZ Friesian and a NZ Jersey, on average, achieves 220 days longer herd life than expected from her parent average. Because of genetic distance, the Holstein x NZ Friesian cross can expect to see a heterosis boost of around 30% of that seen in the NZF x NZJ first cross.

Effectively the farmer gets a much bigger boost to longevity in the herd from heterosis than from additive genetic merit, but it is a one-off (not heritable), so additive genetic merit trends also need to be trending positively for sustained gains

Introducing third breeds can be challenging. Heterosis gains should not come at the expense of genetic merit for desirable traits in any breed introduced to a cross-breeding programme, or the farmer could ultimately be worse off.

3. Manage inbreeding depression risk:

Inbreeding depression occurs when animals share DNA from a common ancestor that reduces performance. Inbred animals on average, have a shorter lifespan or display genetic defects. For survival alone, a 2007 study[2] indicated a 0.3% decrease in cow survival from first to second lactation per 1% increase of inbreeding, while another study[3] estimated increases in dystocia and stillbirths of 0.2-0.42% per 1% increase in first parity US Holsteins.

Crossbreeding removes the effects of inbreeding and is a good strategy for herds running into inbreeding risk problems.

To limit inbreeding, as a minimum, farmers should keep detailed records of matings and calvings, and can use DNA parentage testing of calves for more accuracy. They can seek help from their breeding advisor to develop a mating plan that will identify the best bulls for their cows.

4. Genomic evaluation for more reliable longevity estimations:

Farmers desire as much certainty as possible when choosing bulls. Longevity, by definition, takes many years to express, so for young bulls the breeding value is less reliable.

Genomic evaluation helps by lifting reliability for early estimations from the ancestry-based 20-30% to over 50-65%.

LIC includes genomic information in their bull genetic estimations, reducing the reliance on parentage and genomic information as daughter survival data flows in.

The positive genetic and phenotypic trends for survival, and ongoing New Zealand research into resilience in dairy cow breeding and management should support South African farmers as they seek to realise all the benefits good cow longevity brings. M&H

2 https://www.dairynz.co.nz/animal/animal-evaluation/interpreting-the-info/breeding-values/
3 Adamec et.al (2006)

SAVE THE DATE!

SA DAIRY 2020

Pasture based dairy production workshops

LIC LIVESTOCK IMPROVEMENT

ACS CONSULTING

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We are proud to advise that we will once again be holding a series of Dairy 2020 workshops this year

TWO WORKSHOPS WILL BE HELD IN THE EASTERN CAPE DURING THE WEEK OF 17 APRIL 2023

19th April 2023 - Eersterivier
21st April 2023 - Bedford

TWO WORKSHOPS WILL BE HELD IN NATAL DURING THE WEEK OF 24 APRIL 2023

24th April 2023 - Underberg
26th April 2023 - Nottingham Road

OUR INTERNATIONAL SPEAKERS

JANE KAY

Jane is a Principal Scientist at DairyNZ, Specialising in New Systems and Competitiveness.

Among other qualifications Jane attained the degree of PhD, Animal Sciences: Dairy Cow Nutrition and Physiology, University of Arizona, Tucson, USA

Janes current research specialities include ruminant nutrition, methane mitigation, and farm system comparisons. Previous research focused on milk composition, response to supplements in pasture-based systems, lactation management (e.g., extended lactation, calving season, and milking frequency), and transition cow management.

DAVID CHIN

David joined LIC in 2006 and was appointed to the role of Chief Executive in January 2022. He has held several leadership roles over that time including GM Operations and Service and Chief Transformation Officer.

David is a passionate advocate for herd improvement and the New Zealand dairy industry. David has extensive knowledge and experience working with large herds and corporative, multiple herd businesses.

PETER & MICHELLE WICHMAN

Peter and Michelle have developed simple dairy farm systems that allow staff to enjoy the dairy farm lifestyle. They also have a good work life balance. Driving consistent high farm profits from a grass only farm system, they enjoy cow and pasture management. This allows them to minimise the environmental foot print of food production.

They operate a 1200 cow farm for Armer Farms Ltd while also providing detailed supervision for 7 other farms with 25 staff members.

Peter and Michelle are outstanding individuals on every front. They have raised four sons who are fine young citizens in their own right. Peter and Michelle have very strong connections to the land, cows, people and farm systems.

SAVE THE DATE

Programs, topics and more information will be available soon.
Speak to your agent or Chris at 082 807 1433.