- THE GENIMEX JOURNAL -

MILK & HONEY

Edition 11 • May 2016

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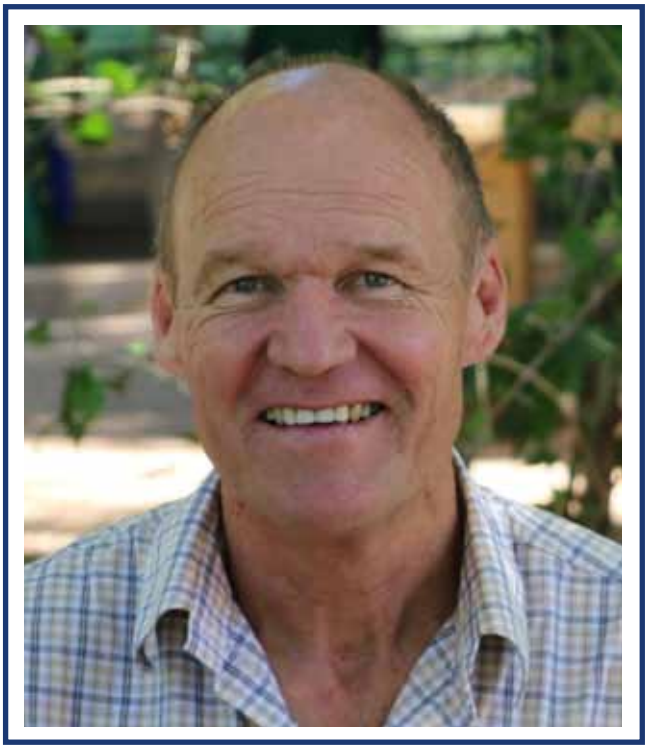
CELEBRATING 20 YEARS!

Foreword

By Chris Cloete



Reputations are not made on what people promise to do but on what they have done. True, but not quite profound. We at Genimex pride ourselves on the fact that we have over the last 20 years built a reputation in the South African dairy industry of being a leader and rather than make promises we have supplied the right genetics in order to keep to our goal of: -

BREEDING HEALTHY FERTILE PROFITABLE COWS

Yes, Genimex celebrates 20 years of supplying genetics into the dairy industry and we certainly have not based the business on promises. Promises like, we will supply you the right bulls in order to reduce the size of your 750 kg Holsteins to 500 kg pasture cows, which we know is not possible. We have not sold you a mating program with promises of breeding you postcard perfect cows as well as reducing the inbreeding in your herd. Knowing that the program can be manipulated in order to just sell you semen that you would otherwise not have bred with.

Our reputation is based on adhering to the basics of science and the well known formula of genetic gain.

While adhering to these principles we have also done things differently.

We have prided ourselves in supplying a superior product at market related prices. The product we have supplied is in demand in the country of origin and not something that nobody wants. We have to compete on price thus cheap semen just cannot and does not happen.

We have even gone so far over the last 4 years to print some of our catalogues without those glossy photographs that are synonymous with the sale of genetics. These posed, manipulated photographs don't pay the bill of our clients. It is facts and reliable facts that help clients pay their bills. With the Genomic era we believe that photographs are a thing of the past.

As we celebrate the 20 years of trading I would like to acknowledge some people and organizations.

To Errol Dicks who started the business with me in 1996 I thank you for your inputs during the difficult start up years, and hope you are enjoying your retirement.

To our two main suppliers Viking Genetics and Livestock Improvement New Zealand I thank you for your assistance, support and understanding during the 20 years. The genetics you have made available to us has certainly contributed to our clients breeding these HEALTHY, FERTILE PROFITABLE COWS.

To Johan Müller who joined the business very soon after it was established, thank you for your hard work dedication and support over the years.

To the ladies in the office that have been out of the limelight answering the phone, packing semen, printing catalogues, sending out accounts and the most difficult thing of all putting up with me, I thank you.

Then a very big word of thanks to the sales men and lady that are the face of the business. These are the people that drive the miles, enjoy the highs of the sale, enjoy seeing the Healthy Fertile Profitable cows on farms and endure the calls from me asking about debtors and stock. Without you the business would not exist and I thank you for your dedication and loyalty to the product.

On the front cover I feature this team of outstanding individuals. The photograph was taken during our recent sales meeting at the Otterskloof Game Reserve near Philippolis in the Free State.

From left to right: Back row: Johan Müller, Willem van Lingen, Simon Alderson-Smith and Dave Swift. Front row: Britt Stanton, Shawn Buckley, Ferdie Myburgh,Hendrik Bezuidenhout and Chris Cloete.

Then a very, very big thank you to you our loyal clients. Some of you will have 5th and 6th generation Genimex bred cows. They are obviously working for you. I can only say thank you and through you we have strengthened our reputation. Those cows bred from genetics supplied by Genimex have certainly made you more money than we made out of the sale of the semen to you and that is how it should be. All of us at Genimex, office staff and the sales force have contributed in some way to improving the cattle in your herd and making sure they are Healthy Fertile and Profitable.

So what does the future hold for us? In the political and economic climate of today the future is even harder to predict than it ever has been but one thing is for certain and that is as long as Genimex continues to trade we will not make promises we will just continue to build on our positive reputation.

I hope you enjoy this the 11th edition of Milk and Honey as we look forward to the next 20 years.

Chris Cloete

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Cover page photo:
Genimex celebrates its 20 years in the industry. Here is the current team of Genimex agents that are such an integral of the business

Contents

Milk & Honey
Edition 11

3 Milkings in 2 days

So why go onto 3in2 milkings? The answer – to best meet the five famed facets of farming of heat, feet, meat, teat and bleat:

1 HEAT

a. Climatic issues – often hot and dry in summer, and wanting to avoid those hot summer afternoon milkings. Cows spend more time eating and resting.

b. Or too wet, and wanting to reduce walking.

2 FEET

a. Logistics – reduce the walking by 25% over summer - especially if feeding summer crops that need daily grazing.

b. 3in2 helps keep condition on cows and saves sitting behind the cows on the race for 1 less milking every 2 days.

3 MEAT

a. Cow condition – less walking keeps condition on the cows.

b. With lower stress levels, 3in2 can help reduce the incidence of foetal absorption over the 1st and 2nd trimester of pregnancy.

4 TEAT

a. Production – if cows are fed the same as when they were on twice a day; the cows will produce the same as 2AD when milked on 2AD after the end of AI.

b. Same production – lower costs.

5 BLEAT

a. Profit – reduce the costs of electricity, heating, animal health and wintering.

b. The cows are happier, staff are happier, the bank manager is happier.

Introduction and History

The main aim of this paper is to give a practical overview of milking 3 times in 2 days. I will also endeavour to discuss the pros and cons of using this regime.

The first significant origins of three milkings in two days (3 in 2) started in the 1970's and 80's. The most common two milking regimes were called 16 hour and 18 hour milking respectively.

The main reasons for reducing milking frequency from four times in 48 hours to three times were similar to today's reasons: cow condition, feed and feet problems, climatic challenges, farm logistics, high Somatic Cell Counts (unable to use OAD as an emergency measure), and staff problems.

Very few farmers went to these 16 or 18 hour milking regimes from first choice – often they were forced into it due to the challenges experienced. After the challenge was mastered, the farmers usually went back to the traditional twice a day milking regime (2AD).

So why didn't these farmers continue milking on these regimes? The main reason I have found is that the hours were just non-compatible with the people. So basically, these regimes were relegated to an emergency option only, used only when OAD wasn't practical.

The Evolution of 3in2

The resurgence to the current 3 in 2 regime started in Nelson and Marlborough in January 2001. Peter and Niki Brooks of Murchison started the 2000 season as per normal on 2AD, but had then switched to the 16-hour regime in November 2000. The district was experiencing severe feet problems in the cows from continuing heavy rainfall events. The Brooks's had used 16 hour milking as an emergency option in the past, and were quite familiar with it. They were doing the traditional 16-hour times of 5.30am and 9.30pm on day one; and 1.30pm the following day. And like everyone else who had spent considerable time milking at these hours – they were finding it quite inconvenient.

At this stage, we investigated the possibility of altering the milking time splits. On 2AD, the Brooks's had milked at 5.30am and 3.30pm – a typical 14/10 split. So we thought – hey if we can have such big variances on 2AD, what can we do with a reduced milking frequency regime? So we changed the times - keeping the morning milking at 5.30am, and brought the night in to 7.30pm, and the day milking to 11.30am.

These split of hours became the new name for this milking regime. It quickly became known locally as 14/16/18. And of course it drove Fonterra and Westland, and the LIC Herd Testers absolutely nuts. Trying to schedule tanker pickups and herd testing accurately around 14/16/18 was a very hot topic for the first two seasons.

The popularity of the system and the hours have grown, till more than half of the districts suppliers can be found milking on 3in2 from Christmas onwards. It has now slowly spreading throughout the country. And of course, once the first farmers found that the hours could be manipulated further, we had to change the name from 14/16/18 to what it is today – known simply as 3in2.

Full Season Use of 3in2.

It is important to note here, that during the last 16 seasons, I have only known two properties in my region that have milked on a 16 hour milking regime for the whole season. Neither farmer was originally my client. As such, I was only able to help them from halfway through the season (immediately altering the 16 hour milking times to the less rigid 3in2 regime).

Production wise, these properties who milked all season on 3in2 peaked lower e.g. 1.7MS vs. 2.0MS on 2AD. They also had a flatter lactation curve, typically around 7% rate of decline from peak; vs. the 9-10% they experienced on 2AD. Total production was down 5-10% on their previous 2AD seasons. These results however need to be considered along the lines that these two farms went onto 16 hour milking for the whole season because they had to.

What they would have produced on 2AD could only be guessed.

Seven seasons ago, a client of mine went onto 3in2 at the start of AI (they had their own AI technician). I felt it would be too early for peak cow udder holding capacity, and so it proved – the cows peaked at only 1.7MS vs. their 1.9MS on 2AD the previous year. That experience gave us an indication of when is too early for changing over from 2AD. Since then, the end of AI (late November - early December) is considered the earliest time when the changeover will have minimal effect on production.

Would I recommend milking on 3in2 for a whole season? Yes, if I had the opportunity to set things up properly. It would depend totally on farm logistics and the exploration of all options.

I believe that 3in2 is one way of tackling pressure situations, and it can be successfully used as part of the solution package. I am completely comfortable recommending 3in2 as a normal part of the milking season, particularly from the end of AI onwards.

How to Use 3in2

The vast majority of dairy farmers start their 3in2 programme any time from the end of AI, to mid January. Often it coincides with feeding summer crops, and wanting to slow the pasture grazing rotation down over summer. Let's make an example:

- A 100-hectare property milking 300 cows. It has 50 two-hectare paddocks, and you typically graze two paddocks (4ha) per day. During peak growth you manage to get down to an 18 or 20 day round by dropping out say 9 paddocks for silage and say 5 paddocks for summer turnips or chicory.
- It's now coming up to Christmas, and you are back on a 22½ day round from the 45 grass paddocks (with 5 paddocks out for summer crop). So what about going to a 30+ day round for summer? On a standard 2AD farm – you would simply feed ½ a paddock of grass for the day feed (plus some summer crop), and 1 whole paddock of grass for the night feed – giving a 30 day round.
- If you are going to change to 3in2 simply stay at one paddock per milking. It is as simple as that. You go straight onto a 30 day round. Note that there are now no tapes to shift right through summer and early autumn. The simplest point about feeding like this is that the size of feeds stays the same at 2 hectares per milking – dead easy for adding in supplements if required.
- So what about if you grow summer crops and you want to go to 3in2 and a 30+ day round? Simply feed the crop after the morning milking on day one, and before the noon milking on day two. This makes the crop available at a similar time each day.

When to milk? I usually suggest that you milk at whatever time you would normally milk in the morning. Say any time between 4.30am and 6 am. During the heat of the summer, milk between 7 and 7.30pm at night, and between 11.30am and 1pm for the noon milking the next day. Be flexible. If you are going out on Friday night, milk them at 6.00pm if you need to – then say at 11am the next day, just to crib a bit of time from the earlier milking the night before. The important thing is to be flexible – the cows can cope if you can.

A very important note - when the nights start drawing in through March, ease the night milking back by half an hour every 2-3 weeks. By the end of April, my clients are usually

milking at 5- 6pm at night, and by the end of May at about 4-5pm at night. For safeties sake, I always like that 1st row of cows back in the paddock before dark so I know they are where they should be.

For those people that are doing the evening milking, ideally they should be finished their day's work on farm by 1.00pm. They should then have the afternoon off till the start of the evening milking. Those staff that aren't doing the evening milking can work to say 5pm. These hours are very important for staff and management morale and sustainability. Everyone gets to sleep in the next day. I would suggest that you work an 8 to 5 day on the second day. All my farmers say that they are able to complete a lot more work under the 3in2 regime than what they normally can on 2AD.

Note that some people cannot handle 3in2. If it isn't going to work, don't force it.

Pros and Cons of 3in2

The biggest disadvantage of 3in2 for people is the milking times. Inversely – the biggest advantage of 3in2 for the cows are the milking times. But for people, the evening milkings are still a pain, as they can cut into social time. 3in2 requires more organisation. That is the main downside. During the heat of the summer though, a 7pm milking can be very enjoyable. And remember – the evening milking is only every second evening. This is the price for everyone enjoying the sleep-in on the second day. The best thing with 3 in 2 is that you can work office hours every second day right to the end of the season.

Expenses wise, two of my regular 3in2 clients are in a benchmarking group with 9 other farmers under similar farming conditions. They are placed 1st and 2nd for profitability in this group. Their production per cow and per hectare is at the upper end as well for the group.

From their results, and from my other clients on 3in2, I have reached some informal conclusions on what is happening.

- The cows have always ended the season in good order when on 3in2 – better than they have traditionally achieved on 2AD for the whole season. Farmers have nearly always done the same or more production for the whole season when they have gone to 3in2 post-Christmas (seasonal fluctuations notwithstanding). All farmers on 3in2 have found that they can milk nearly every single cow right to the last day. It is likely that the increased days in milk for more of the cows have been one of the main drivers for improved production.
- A number of farmers have commented that their calving spreads have tightened and that their in calf rates have improved compared to when they were on 2AD. Whether this is a result of the 3in2 milking regime is an unknown, but the farmers concerned are convinced of it. From a long-term point of view, the farmer's opinion that their cow's reproductive performance has improved will also have an impact on profitability.
- Farmers have also found that they have not had to buy in or feed out as much extra Dry Matter in the autumn to put weight back on cows going into the winter. In general, we have also figured a Shed Cost saving on power etc of $1/cow/month as well – e.g. 300 cows on 3in2 for five months can save $1,500.

Going to 3in2 around Christmas usually means that there is no negative effect on the Somatic Cell count. Cows can usually hold the same amount of milk after 5 months of lactation (when they are changed to 3in2), that they were holding for a typical 15-9 hour split when they were on 2AD. I actually get quite frustrated at a typical afternoon milking in the middle of summer when the cows walk all that way in the heat to give 5 or 6 litres – by waiting till when the udder is full a few hours later you can certainly beat the attack of the slack sack!

To help answer a lot of our questions on 3in2, we need to look forward to the full utilisation of Dairybase by farmers. The different farming and milking regimes can then objectively be dissected, measured and compared on all aspects of production and performance.

Further developments and challenges with 3in2, 2AD and OAD

A number of farmers are exploring integrating a mixed milking frequency regime. Such regimes are looking as follows:

- Farmers are starting on OAD for the first 2-3 weeks of lactation in spring (easier on staff and cows).
- The cows are then milked on 2AD until either the end of AI; or when the summer crops are ready, or they wish to better match 3rd ryegrass leaf with a 30 day grazing rotation (typically around Christmas).
- The cows are then milked on 3in2 until the middle of April.
- Mid-April the cows go onto OAD again until the end of the season (often a 45-50 dayround, still grazing 1 paddock per day).

Compared to the typical 600 milkings on 2AD for a season, the results achieved are now approaching 500 milksolids/cow from less than 500 milkings for the season. Two farmers in this region are now achieving very close to 1 kg MS/milking. Implications for profitability are obvious, and are likely to show a higher correlation compared to a traditional 2AD system.

Summary

Farmers will continue to evolve their systems to better suit staff, the environment, and the logistics they work under. OAD, 2AD, and 3in2 will all have their roles to play – every farm and farmer is different, and it is our role to help them optimise the system they wish to utilise in their business – typically simple, productive and profitable dairy farming.

So this year, give the cows, yourself and your staff a break. Ask them if they are keen (you usually find they all want the sleep in – but don't want to do the Friday or Saturday night milkings!). Ease things off slowly, and match the grazing round length to milking frequency. M&H

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Genimex celebrates 20 years in business

At this years bi-annual sales meeting Genimex celebrated 20 years in the industry. The meeting was once again held at Otterskloof Game Reserve near Philippolis in the Free State. We were fortunate to have Peter Larson and Seppo Niskanen attending the meeting to inform the agents more about the systems and programs in the three countries (Denmark, Finland and Sweden) that make up VikingGenetics.

Seppo Niskanen and Peter Larson of Viking Genetics.

Chris Cloete hands over the prize for the debate held during the meeting. Willem van Lingen won the debate in which he had to oppose the motion "Genomic bulls are simply glorified progeny test bulls". Willem's prize was the book written by James Paterson, "A History of the Jersey Breed in South Africa"

The young ones of the team Ferdie, Britt, Simon and Shawn.

Johan Müller of Genimex hands over a token of our appreciation to Seppo Niskanen of Viking Genetics.

The group at the meeting. Back From Left to right Johan Müller, Willem van Lingen, Simon Alderson-Smith, Dave Swift, Peter Larson, Chris Cloete and Seppo Niskanen.
Front from Left to Right: Britt Stanton, Shawn Buckley, Ferdie Myburgh and Hendrik Bezuidenhout.

In a lighter vain Johan Müller receives the booby prize.

Getting back to basics

Heat spotting

As the years have passed and herds have got bigger, so the use of heat spotting aids (Bulling Beacons, Scratch E's, tail paint and electronic sensors) has increased and in many cases basic heat spotting is not done and insemination takes place using only the heat spotting aids.

I, however, feel that there is still some place, even in the large herds, to have some knowledge of the signs of heat as the cow goes through her cycle.

Many years ago, in fact before the advent of digital photography, I took a series of slides, in a Brahman cross herd in the then Northern Transvaal, of cows showing various signs of heat. After reducing the number of slides to 70, the series was used at AI courses to illustrate to students the various signs associated with heat in cattle.

The period that a cow is on heat can be divided into three phases, Pre Heat, Heat and Post heat. Really good stockmen should be able to predict when a cow will be on heat simply by seeing pre heat signs.

I have selected a short series of photographs to illustrate the heat signs. Please understand that these are scans of slides so the quality of the photos is not the greatest but will certainly illustrate the point. These photos together with the complete description as written by Hendrik will, I hope, assist in the very important task of heat spotting. M&H

Excessive bellowing. A clear sign that the cow is restless and possibly coming on heat.

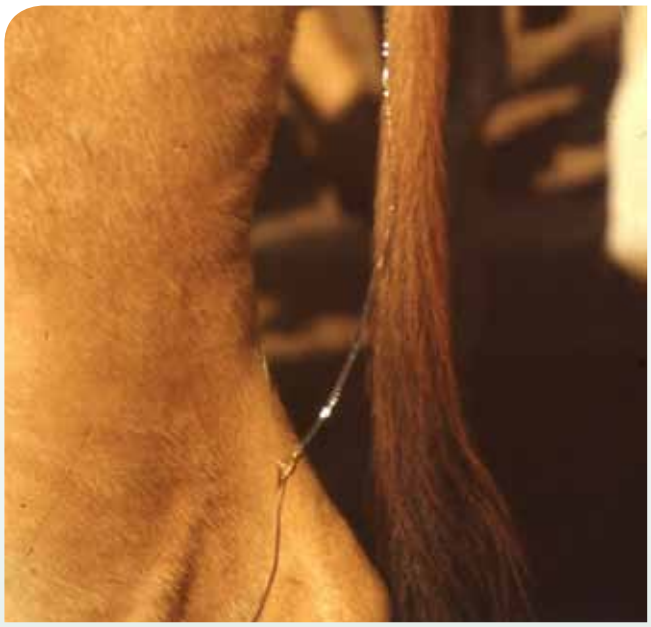
Restlessness and head butting.

Head butting and restlessness.

Head raising and lip curling after sniffing the genitalia and urine of the cow that is on heat.

Clearly the cow is not standing still so she is still in the pre heat period.

Prior to mounting, cows often rub their chin on the rump of the cow to be mounted. This way they can test the receptiveness to being mounted.



The mucous discharge or bulling string in the pre heat period is very thin and watery.

Clearly the cow is on standing heat. Note where the brisket of the cow mounting her is. That is why care should be taken not to put a Bulling Beacon too far back. It is the cows brisket that activates the Beacon.

A bull string when the cow is properly on heat is thick and gelatinous. During the AI process the bull string usually comes out and is a really good sign. However take note that it is clear and has no white flakes in as that could indicate an infection.

The vulva of a cow on heat is swollen.

The hairs on the tail head stand up when a cow has been ridden. It is this sign that forms the basis of the use of tail paint. The using of tail paint is an art and must be done, touched up and read with care.

Muddied flanks and saliva on the back, as on this cow, are clear signs that the cow has been ridden and is or was on heat.

During the post heat period the cows tend to lie down as they are tired and the post heat bull string is opaque but should still not have flakes in.

An opaque post heat bull string.

A bloody discharge is normal one to three days after the cow has been on heat. Should you see this and the cow was mated it does not mean that she failed to conceive.

Heat Detection in Dairy Cows

Everybody agrees that the single most important management requirement for a successful AI Program is effective heat detection since it can have a major impact on overall herd reproductive performance. Accurate heat detection is the key to ensuring semen is not wasted by inseminating cows not on heat and for cows to conceive at the right time.

There are many challenges of detection of estrus on farms. Whatever the cause, a low accuracy will increase your calving interval and interval between inseminations.

In the case of seasonal breeding (1 or 2 seasons) your key indicator will be a low 3-week submission rate. This is very important as your submission rate is a key driver of the 6-week in-calf rate.

Top farmers achieve a 95% 3-week submission rate for early calving, mature cows. If it is less than 85% you should review your estrus detection strategy and / or the likely cause of an excessive number of non-cyclers.

The first step towards better results is to assess your current heat detection practices. Do you miss a cow that is actually on heat or do you misinterpret the signs shown by a cow?

Normally you can expect cows or heifers to show signs of heat every 18 - 24 days with an average of 21 days.

IMPORTANT SIGNS TO LOOK FOR IN A COW THAT IS ON HEAT:

- ✓ The cow stands STILL when being mounted by other cows. This is the most accurate sign of heat.
- ✓ When using paint, it would be rubbed off.
- ✓ When using heat mount detectors, it will be fully red (triggered)
- ✓ Look for other signs indicating heat:
  - Bull-string solid and clear
  - Vulva swollen and mucus present
  - Saliva on the tail or rump
  - Muddy/Dung marks on the lower hips, sides or shoulders
  - Hair on the tail head ruffled or rubbed off as well as on the hipbones.
  - Separates herself from the rest of the herd.
  - Restless or bellowing
  - Trying to mount other cows
  - Poor milk letdown
- ✓ Cows showing two or more of these signs are possibly on heat but showing weak signs or might be coming on heat.

Remember a bloody vaginal discharge is a sign that the cow was on heat 2 - 3 days ago.

The average duration of heat in dairy cows is about 13 - 14 hours. Heats can however be as short as 2 hours and as long as 28 hours.

TIPS TO IMPROVE YOUR HEAT DETECTION

1. **Have a plan in writing and stick to it:**
   - Who is going to heat detect? How often will they do it? When will they do it and for how long? Where will they do it?
2. **Know and recognize the signs:**
   - Review people's heat detection skills practically amongst the cows. Are they up to scratch? Do they know exactly what to look for? Do they need training?
3. **Time must be well spent:**
   - You cannot satisfactorily perform heat detection while doing other chores i.e. fixing pumps etc. - It is too important! Take sufficient time to observe all animals. A period of at least 30 minutes is recommended.
4. **Frequency and most opportune times:**
   - Successful heat detection requires checking for heat at least twice a day so as not to miss those shorter heats.
   - If possible a third detection can be done around midday or late morning.
   - Frequency of mounting increases early morning and early evening. Do you include these times in your schedule?
5. **Positive identification:**
   - This is so logical but I am still amazed at how people get it wrong. Are your ear tags clearly visible and readable – even at a distance? Do you supply your staff with good flashlights / torches in winter when it is still dark?
6. **Write it down:**
   - Record all heat information. Ensure that your staff have pocket books and pens.
7. **Determine which aids you will use:**
   - Farmers with the best results use a combination of observation and heat detection aids. No one method is perfect. Several options are available.
   - **Tailpaint:**
     - Least expensive but also an effective aid. Advantage is that different colours can be used.
     - Paint is applied to the rear of the backbone and to the front of the tail head.
     - Apply a strip no more than 20cm long and no more than 5cm wide and sufficiently thick.
     - Tail paint will be rubbed off by cows mounting.
     - Be sure to use commercial tail paint for cows not house paint or roof paint.
     - Touch up tail paint at least weekly.
   - **Heat mount detectors:**
     - These are a little more expensive but easier to read and require less maintenance.
     - There are 2 types available - pressure activated tubes or scratch - off stickers.
     - Results in higher detection rates particularly in herds where less skilled staff are checking for cows on heat.
     - Check them regularly and replace if they are damaged or come loose.
     - Apply heat detectors just behind the backbone almost between the hipbones and ensure dust or loose hair are removed before applying them.
   - **Activity meters (including pedometers) :**
     - These are electronic transponder's that detect movement and are integrated with computerized systems.
     - More expensive and staff needs training in the use of this technology.

TIMING OF INSEMINATION

Optimal timing of insemination relative to the onset of estrus has been an active area of research for nearly 80 years.

Recently it was acknowledged that as milk production increases due to genetic selection, duration of estrus decreases.

Due to the short lifespan of the oocyte in cows (6-8 hours), the interval from AI to ovulation is critical for optimizing fertility in dairy cows. Ovulation can take place from 6 – 14 hours after the end of estrus or 20 – 32 hours after the onset of observed estrus.

Sperm viability is also important. Frozen semen can retain its viability for up to 30 hours in the uterine tract but also require a minimum of 6 – 8 hours for the phase of sperm transport to the site of fertilization as well as the sperm capacitation process.

CONCLUSION AND RECOMMENDATION

Use of the traditional a.m.-p.m. rule may not provide the best conception rates because cows probably will be inseminated far too long after the onset of observed estrus. The exact onset of estrus is usually unknown. For example, according to the a.m.-p.m. rule, a cow beginning estrus at 11 p.m. at night and observed in estrus at only 6 a.m. in the morning, would be inseminated 16 – 18 hours after the onset of estrus.

Numerous trials involving large numbers of cows have all come to the conclusion that cows should be inseminated within 4 -12 hours of observed estrus when the precise onset of estrus is unknown. If estrus detection is conducted twice daily, most cows should be within this time period.

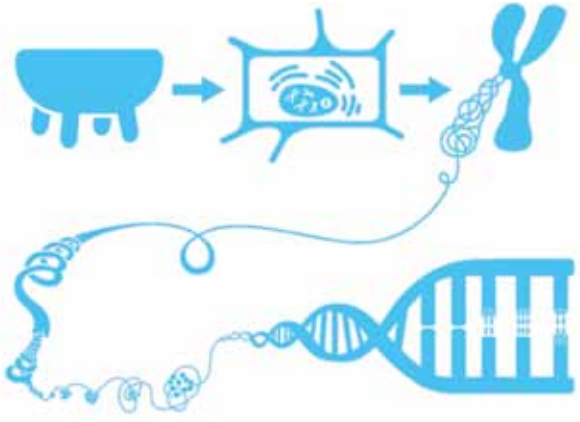
Therefore a single mid-morning (after milking) insemination of cows that have been observed in estrus the same morning or the previous evening, should provide the best conception rates. M&H

Genomics

Genomics is the branch of molecular biology concerned with the structure, function, evolution, and mapping of genomes and its DNA.

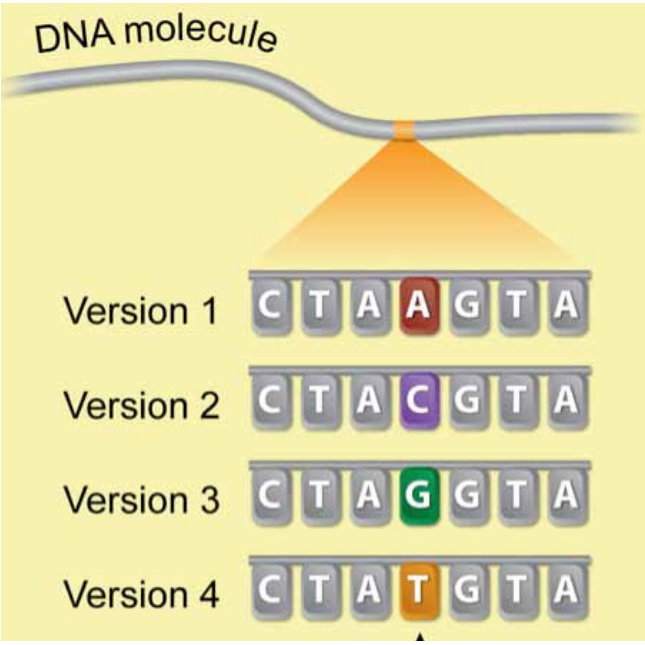
DNA, or Deoxyribonucleic acid, is the chemical compound that contains all the necessary instructions to develop and direct nearly all living organisms. DNA molecules make up two twisting, paired strands which form a double helix. Each DNA strand comprises of four chemical units called nucleotide bases. The bases are, Adenine (A), Thymine (T), Guanine (G) and Cytosine (C). These four bases make up the genetic alphabet much the same as the A B C's make up our alphabet. Due to the double helix of the DNA strand, pairs are formed. A pairs with T and G pairs with C. The grouping order of these four base pairs will encode the information of life, much the same way letters in the alphabet code the words in this article.

An organisms complete set of DNA is called its genome. The cattle genome consists of 30 paired chromosomes, 29 pairs of autosomes and 1 pair of sex chromosomes. Like humans, XX for female and XY for male. Each chromosome consists of one long strand of DNA. The genome consists of over 22 000 genes coded by roughly 3 billion base pairs.



Genes direct the production of proteins with the assistance of enzymes and messenger molecules. Specifically, an enzyme copies the information in a gene's DNA into a molecule called messenger ribonucleic acid (mRNA). The mRNA travels out of the nucleus and into the cell's cytoplasm, where the mRNA is read by a tiny molecular machine called a ribosome, and the information is used to link together small molecules called amino acids in the right order to form a specific protein. Proteins make up body structures like organs and tissue, as well as control chemical reactions and carry signals between cells.

Genomic selection is the selection of animals based on their genetic markers or Single Nucleotide Polymorphism's (SNP's). SNP's (pronounced snips), are a DNA sequence variation within a population with a high enough abundance to enable scientists to "look" into the coding sequence of DNA. These SNP's, variations, make up the markers used in Genomic selection. When combined with a reference populations progeny data, the scientists are able to predict breeding values of complex health, production and reproduction traits.



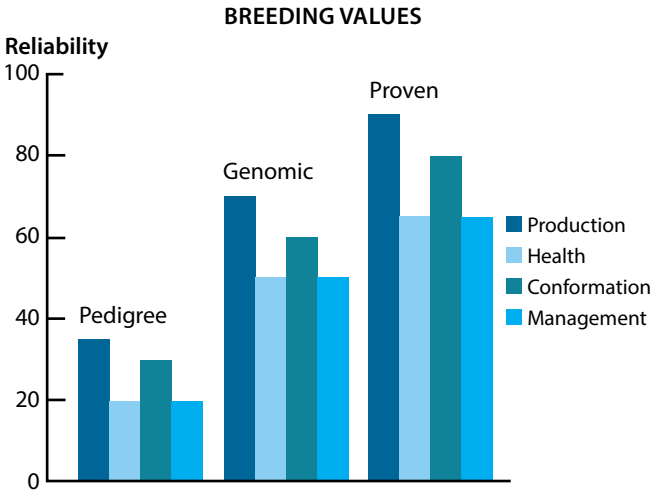
The main advantage to Genomic selection is the added information to traits with low heritability such as the functional traits like, fertility, longevity and udder health.

A reference population is the source or "library" from which all marker data is based. Phenotypic data is gathered from daughter proven sires, and cows/heifers, from a range of environmental and management conditions. Combined with molecular marker or SNP data, scientists can then compare marker scores from unproven bulls to this library and enhance EBV's (Estimated Breeding Values). Hence the term Genomically Enhanced Breeding Value or GEBV.

Four main factors influence the integrity of Genomic selection. Firstly, the size of the reference population, the more records the higher the reliability. Secondly, the quality and quantity of data registrations, high volumes of accurate recorded data are essential. Thirdly, the efficiency of the methodology, chip technology and calculation methods. It must be iterated that Genomic selection has no international standard therefore intensities and calculations vary from country to country. Lastly, homogeneity of the breed.

It is imperative for the continued adding of information from performance schemes to ensure the integrity of the results from Genomic selections. Mutations and recombination events can cause a divergence within and between populations, so the ongoing performance testing will ensure the maintenance of reliabilities within the Genomic figures.

Pedigree indexes and daughter proofs have the same reliability regardless of breed. Genomic values will differ between breeds due to differences in reference populations.



$$\text{Change in genetic gain} = \frac{\text{Std. Dev.} \times \text{Heritability} \times \text{Accuracy of selection} \times \text{Genetic variation}}{\text{Generation interval}}$$

The formula above illustrates the importance of Genomic selection along with the technologies and practices surrounding its use in the dairy industry. The most obvious benefit is the reduction in generation interval, two year old sires are used as apposed to the five year old daughter proven sires.

DNA SELECTED - 4 years

Thousands of bull calves

YEAR -1	YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Cows selected for contract mating	Thousands of bull calves DNA screened. Best bulls selected	Semen from 160 elite bulls despatched into Sire Proving Scheme herds	Elite bulls available for widespread use	3 years advanced genetic gain		

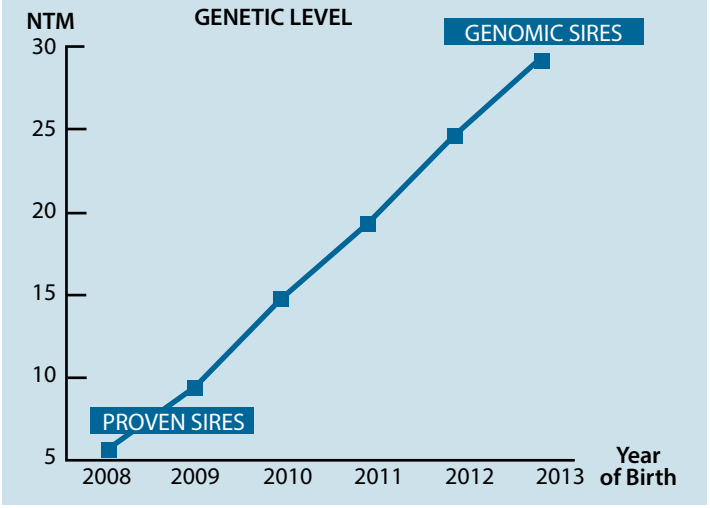
DAUGHTER PROVEN - 7 years

Hundreds of bull calves

YEAR -1	YEAR 0	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Cows selected for contract mating	Bulls calves purchased	300 bulls used in Sire Proving Scheme herds	Daughters born	Daughters mated	Daughters calves	25 elite proven bulls available for widespread use

What is often overlooked is the accuracy of selection. As mentioned above, the ongoing performance testing and recording of animals will ensure the continued and increased accuracy of selection.

The use of Genomic selection in the dairy industry is fast becoming the norm, and for good reason. The increase in genetic gain is evident in all the top sire lists around the world being predominantly made up of genomic sires. (M&H)



SHE'S GOT ONE IN THE OVEN

With pregnancy diagnosis done, we take a pictorial look back at what occurred during the mating season to get to where the typical farm is at now, with a look ahead at what can be expected later on down the track.

1 Proven bulls ready for AB season - fed well, up to condition, and healthy

2 Collection from LIC farm

3 Led by handler to encourage the bull to work up

4 Artificial vagina warmed to temperature, about 45 deg C

5 Collection of semen takes place

6 Sample recorded and labelled before being passed to laboratory

7 Semen cells are investigated for quality control purposes

7.1 Fresh liquid processing for immediate dispatch to field…

7.2 ... or semen is processed as frozen for later dispatch on-demand

8 During season peak thousands of straws go out each day to locations throughout the country, transported by road in specifically designed utes and by air.

9 Final checks for the morning's AB run are made

10 The AB Technician arrives on farm

11 Insemination takes place

12 Pregnant, healthy high-BW cows with replacement stock in-waiting

13 Calving time

14 Quality replacement stock following calving - a new generation representing the herd's future.

THE LAB & AB DISPATCH

A millilitre of fresh bull semen contains between 500 million and 1.5 billion living sperm cells. Microscopes magnify semen samples by a factor of 500 so individual sperm cells are able to be seen for quality control assessment.

Once collected, analysed, processed, and transported, fresh semen gets inseminated into cows within three days or so.

Last AB season about 5 million straws of fresh semen were produced by the LIC team; this season the number of distributed straws was projected to be about 4.5 million. Including frozen semen, nearly 7 million straws were processed by season-end (May) in 2015. The peak period of this season's AB period lasted 21 days, when more than 100,000 straws were dispatched by LIC each day. The biggest day came on 30 October when 142,000 straws were distributed to LIC's network of AB Technicians.

VIKING JERSEYS

van krag to krag met waarde eienskappe

My keuse van drie bulle wat 'n groot verskil in jou kudde sal maak

Die nuutste produksie data

Die nuutste produksie syfers uit Denemarke bevestig net dat hulle goed oppad is om hul 2020 teeldoelwit te bereik. Die 300 kg proteien vlak is alreeds bereik. Met meer as 68000 koeie wat 'n gemiddelde produksie van **7376 kg - 5.87% 433 kg bottervet en 4.14 % 306 kg proteien,** produseer, is Viking Jerseys beslis die leier wêreld wyd. Meer as **35 kuddes produseer reeds oor die 8000kg** en 8 kuddes staan reeds oor die 500kg mylpaal vir bottervet. Vyftien kuddes produseer reeds meer as 350 kg proteien per koei. Vervolgens die rekords van die top 6 kuddes in Denemarke asook die top 3 koeie se rekords:

TELER	KOEIE	MELK KG	%BV	KG	%PROT	KG	V+PROT
Peter Hoj	152	8709	6.01	523	4.19	365	888
Michael Bak Hansen	358	9024	5.76	520	4.05	365	885
Anders Peter Bang	149	9133	5.46	499	4.08	373	872
Carsten Asmussen	139	8686	5.93	515	4.07	354	869
Mads Kragh	368	8570	6.03	517	4.1	351	868
Lars Aage Rasmussen	159	8924	5.71	510	3.99	356	866
Max Hansen	143	9039	5.68	514	3.9	352	866
Soren H Madsen	565	9023	5.43	490	4.05	365	855

TELER	BUL	MELK KG	BV %	KG	PROT %	KG	BV+PR
PREBEN VINGBORG	VJ HAIFA	16444	4.77	784	3.39	558	1342
PREBEN VINGBORG	DJ HULK	11978	6.88	824	4.27	512	1336
JACOB THOMSEN	DJ HOVBORG	11706	6.73	788	4.36	510	1298

Hierdie ongelooflike syfers is die resultaat van doelgerigte teeldoelwitte en is maar net weer 'n bewys dat ons kliënte wat van hierdie bron gebruik maak, beslis die vrugte daarvan sal pluk.

Genomiese bulle vir die toekoms

VJ RODME (Hubert x DJ May) GNTM 20

Rodme is geteel uit Nygaard May Kirsten deur die Hansen familie van Nygaard in Denemarke. Hy is die seun van VJ Hubert (DJ Hulk x Q Hirse) en het dus baie sterk en bekende bulle in sy stamboom soos Hulk, Hirse, May en Impuls. Die moeder, 'n May dogter, produseer 7400kg melk met 5.76 % bf en 4,12 % prot.

Rodme gaan baie gewild wees by telers wat veral klem lê op tipe. **Sy bouvorm indeks van 115 en uier indeks van 112 plaas** hom in 'n klas van sy eie en kan dus wyd gebruik word om veral groot koeie met uitstekende kapasiteit en uiers te teel. 'n Besonderse uiergesondheids indeks van 112 gaan verder bydra tot sy gewildheid

Rodme

VJ HIHL (Husky x DJ Zuma x Bungy) GNTM 19

Hihl is geteel uit Bruunsgaard Zuma Sangko deur Hendrik Buunsgaard van Fihl in Denmarke. Uitstekende vaste stowwe in die stamboom is 'n kenmerk van die bul. Die moeder Sangko het 'n gemiddelde produksie van **7500 kg met 6.51% bottervet en 4.37 % proteien**! Die Ouma se produksie van **6973 kg 6.26 % bv en 4.50 % prot** is net so indrukwekkend. Soos sy vaar Husky, teel hy besonderse groot koeie met baie goeie bouvorm en uiers. Gebruik Hihl om **proteien en bottervet kilogramme te verhoog** en veral ook **suiwelsterkte en uiers.**

Hihl

Beproefde bul met hoë betroubaarheid

VJ LINK (Legacy x Q Hirse) NTM 18

Link is geteel uit Lango Hirse Donna deur Aksel Rubaek in Denemarke. Sy moeder het 7 laktasies voltooi met gemid. 7040 kg 5.8% bv en 4.06% prot. **'n Uitkruisstamboom** en besonderse ontledings vir dogtervrugbaarheid, uiergesondheid en ook hoefgesondheid, maak hierdie 'n uiters gewilde keuse. **Sy dogtervrugbaarheid van 123** moet van die beste wees in die bedryf. Ek het verskeie dogters in Denemarke gesien en die hoë produksie koeie met baie goeie suiweleienskappe en **uiters goeie bene en hoewe,** het ons baie beindruk. Die bul kan op 'n wye front gebruik word en telers moet beslis sy vermoë om inteling hok te slaan, raak sien. M&H

Link dogter

Musings of an Old Agriculturalist

Farming's long lead times between initiation of production and starting to reap rewards can place constraints on decision making. For example, from inseminating a cow to production of offspring is about 33 months (and let us say a 60% chance of success on first insemination and then there is a 50% chance the calf will be a bull calf), or 24 months (at best) between birth and calving. In other words, decisions made long ago affect what is happening now. Add to this uncertainty the fact that cows are calving following a roster (in a non-seasonal calving scenario), and farming and feeding conditions are dynamic depending on season.

This places added pressure on the farmer's daily management tasks, having to juggle milk production, feed production, labour management and financial matters.

It may be that the operation is large, with hired management in certain positions looking to daily matters, but the owner cannot avoid being involved in financial management. Even if there is a financial manager in the office, the owner will be ultimately responsible for any decisions made and the long term effects of them. Often it is these important financial decisions that are neglected, and made on the spur of the moment.

If the operation is profitable it does not mean that these decisions are any easier. Indeed, if it is tax related a good decision is even more difficult. If the accountant warns you that tax will be payable (hopefully a few months in advance of submission of your tax documents), do not react at once. Many farmers have made hasty decisions. And many, with respect, are as a result of an accountant's advice without access to the bigger picture.

Here are four scenarios:

Of course, standing back and paying the tax is an option. It is the easiest, and requires no extra thought or planning. It is possible to save oneself into bankruptcy.

Here is a common scenario: go out and buy a shiny, new tractor or piece of equipment. It is always easy to defend the action, though not really strongly. That the tractor is "old" and may shortly need some attention, or "the older of the two mixing wagons is starting to need new wheel bearings" are poor reasons for increasing your debt load for a further 60 months. Spending some money on repairs (tax deductible) is logical. Claiming the depreciation allowance on a new piece of equipment is little consolation. I have yet to see this deduction actually invested in an interest bearing account to partly finance the next big necessary purchase. Depreciation is just an entry on the income statement decreasing taxable income. If this allowance was invested a very small HP (if any at all) would be required for the next equipment purchase.

To decrease taxable income is easy. The trick is to approach this matter in a way that will add to the business rather than effect a short term solution with possible long term effects. You do not need another long lead time decision to add to the heap you have already made.

Depending on circumstances, a conservative approach may be a reasonable third choice: to decrease interest bearing debt and consolidate debt if possible.

A pro- active fourth approach is the principle of getting the greatest amount of advantage from the least investment. Start by looking at the greatest risks inherent in the business that you have power over. Try to decrease these first. Your greatest risk may be feed costs and supply, then disease control and finally management.

Taking measures to decrease risk (i.e. increase proportion of

quality home produced feed in your ration) may open many options, ranging from infrastructural investment (say a storage shed for feed inputs or hay to eliminate quality loss due to weather), to increasing irrigated area, water storage capacity or upgrading of irrigation equipment.

The above are short term actions with long term spin-offs and will improve the balance sheet.

Steering away from capital investment is possible through upgrading of present feed production. Instead of only replacing say 25% of the ryegrass, it may be possible to replace more, or catch up with what should have been replaced last year but wasn't. Technically speaking the inputs should be pro-rated over the life of the asset (pasture), but this approach is seldom considered these days.

Most farmers know that to pay next year's crop inputs before the end of the financial year is wise, and this is still a good way of tax avoidance. Not only can a discount be negotiated, but price increases are also avoided.

If good arable land is available as an option in keeping with risk reduction is available: produce a quality feedstuff that can be stored. Hay is one, silage is another. I am aware of no crop that has the potential of maize silage that produces such versatile quality feed in such abundance at such an attractive price. In fact, maize as a grain crop is also possible. Silage however has the safe storage advantage with little risk. If properly sealed age does not count against this feedstuff, it cannot easily be stolen, will not burn, quantity and quality can be ascertained and the balance sheet will benefit from "feed on hand".

Once risk options become unattractive in terms of the cost /benefit ratio in the feed scenario, turn to the next most attractive choice for risk reduction. In this case it would be disease control.

Investigate and calculate again the most efficient method of avoiding tax in this sphere. Again it may be a simple and cheap solution with handsome returns. Continue the search to avoid tax in the most cost beneficial manner. When the benefit: cost equation is no longer attractive move on to the next most important risk in the business- management listed.

How can attention here improve my bottom line for a small investment? For example, a consultation with an Estate Planning fundi may help decrease taxable income in the future (and aid succession planning).

No scenarios sketched above are flashy or use available capital for any outward trappings. We leave those to people wearing thick gold chains, wearing Ray Bans, drinking expensive brandy and bragging about the size of their overdraft. They may even be forced to sell off a portion of the farm when the interest rate climbs a percentage point or the milk price drops 2 cents/litre.

Having a tax problem one year is not a reason to get complacent: winds of change will surely blow again and can shift the entire farming scenario. The trick is to be as prepared as possible for those sneaky and untimely winds. But well done for having a tax problem occasionally. M&H

DROUGHT MANAGEMENT

Ken Bartlett • FarmWise Consultant NZ

Drought Management

The most important factor in drought management is to keep as many cows milking as possible till the rain comes.

To do this:

1. Destock the farm now to ensure you keep the most efficient cows milking during the dry period these cows in a grazing system are NZ bred cows as these cows are the most aggressive grazers than other cows in your herd.
   Keep cows milking that are early in lactation and producing well with good body condition score. Do not keep empty cows milking.
2. Work out how much feed you have till normal rain comes, e.g. Supplements on hand now.

Measure Supplementary feed in stacks [Maize Silage] 220Kg DM/m3.
Grass Silage 200 KG DM/m3 OR 160Kg DM/bale.
If supplements are needed after you have worked out your feed plan, purchase them early . This could include grazing out dry pregnant cows. This feed will be needed for when the rain comes to build up feed cover with Nitrogen.

Winter

Dry off thin pregnant cows so supplements are not needed to put on body condition.

Milking Frequency

With NZ bred cows when in production and before feed is disappearing we can change milking frequency to:

3 and 2

This is when cows are milked 3 milkings in 2 days.
Day 1 - Milk in the morning at normal time say cups on at 6am then in the afternoon cups on at 4pm.
Day 2 - Milk at 12.30-1pm.
Advantages: less energy used on walking and little increase in SCC. Feed cows the same.

Once a Day [OAD]

With low bulk SCC Say 150,000 go on OAD and feed the cows the same . Milk in the morning less heat stress can help with Body Condition Score Production levels have to be 1.2-1.3 Kg M/Solids per cow to get the best result. M&H

Head of Breeding: Lars Nielsen, VikingGenetics

Genomic Selection in VikingGenetics Breeding Scheme

VikingGenetics has used genomic selection as the key selection tool in our selection of breeding animals since 2008. We have made several progresses in the tool since the introduction – and today it is a totally integrated tool in all selection decisions.

The reason for introducing genomic selection is the possibility of improving genetic progress. So far we have increased genetic progress by close to 50 % (from 2 to almost 3 NTM units per year). The main reason behind the improved genetic progress is the reduced generation interval. In 2008 the sires of new born calves were on average 6,5 years old and in 2015 average age for the sires was 2,5 years.

Today 95 % of doses used on home market in Denmark, Sweden and Finland are from young genomic bulls.

An important tool behind genomics is the reference group, this being a kind of genomic dictionary. Until 2014 the genomic reference only contained daughter proven bulls. It was a challenge for smaller breeds like the Jersey. For that reason we investigated possibilities of adding females with phenotypes registered on high quality level – and it has shown to have a good effect.

For that reason, each year VikingGenetics tests close to 30.000 "reference females". When we test these reference females we test the whole herd – as several investigations has shown that only testing high index females will add bias (noise) to the reference. Adding females to the genomic reference has improved reliability remarkable. The size of the reference group is shown in table 1:

Table 1: Nordic genomic reference for Holstein, VikingRed and Jersey, February 2016.

	Daughter proven bulls	Cows	Average reliability	Source
Holstein	26000	14900	60-65	Nordic plus EuroGenomics
VikingRed	7800	19600	50-55	Nordic plus Norway
Jersey	2400	13500	45-50	Nordic plus 1200 US bulls

Even though reliability has increased and is far ahead of pedigree information – reliability is still a bit behind the level for daughter proven bulls. But the average genetic value on the genomic bulls is far ahead of daughter proven bulls. So remember to use a variation of genomic bulls and not only 1-3 per year. It will be too risky.

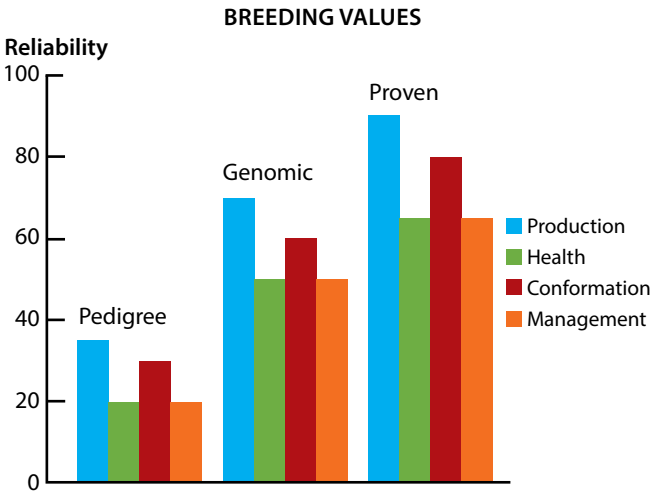


Figure 1: Relative level on reliability on pedigree index, genomic and daughterproven indices.

The Viking Genetics breeding program

Viking Genetics has strong breeding programs for Viking Red, Viking Jersey and Viking Holstein and uses genomic selection equally in the programs.

In table 2. key figures for our breeding program are shown:

Table 2: VikingGenetics breeding program - annually

	Viking Red	Viking Holstein	Viking Jersey
Genomic tested bull calves	3000	3000	500
Bought bull calves	150	125	55
Bulls started in AI	100	100	40
Flushed females	400	400	100
Embryos	4000	4000	1000

The Viking Red, Viking Holstein and Viking Jersey populations are screened for the best females. The highest ranked will be flushed to VG on home farm or VG-facility. The females ranked just below the donor heifers will be inseminated with sires of sons – and born bull calves will be genomic tested like bull calves coming from ET. Even though genomics is the main parameter for our selection – all dams of bought bulls are inspected before we buy.

When we select bulls for purchase we focus on high NTM (total merit) but also to have different strengths on trait level and variation in pedigree to avoid inbreeding. All 240 bulls started in AI will be used as sires of sons to reduce the risk of inbreeding. We use the first doses of each bull for flushings or matings on high index females. Often we have the first the doses available when the bull is 12 months old.

If you focus on a good financial result – and want to work with problem free, healthy and long lasting cows – semen from Viking Genetics will be an excellent tool for YOU!

The Genimex "SUMMMT"

SETTING, UNDERSTANDING, MANAGING AND MEETING MATING TARGETS

The SUMMMT program identifies four periods in each year for each of the mating seasons in the year. The dates of these periods are set according to each clients requirements and then the program indicates what has to be done and by whom and by when.

The targets are set and when the tasks are completed the results are entered and compared to the targets. Furthermore, as time passes the results of one year can be compared to previous years.

In broad terms the year is divided into the following four periods and here are the objectives and targets for each period:-

Late Lactation.

Spring mating herd — March, April and May

Autumn mating heard — November, December and January

Objectives - Balancing of this season's production needs with next year's 6 week ICR BCS are met.
Review this seasons mating results.

Targets - Dry-off and feed to meet BCS (85% of cows at BCS 5).
Rising two year olds and Rising three year olds at BCS 5.5.
Rising one year olds at 40% of mature live weight at 9 months.
Rising two year olds at 90% of mature live weight at 22 months.

Review - Assess herd BCS and feed budget to monitor progress.

Pre-calving.

Spring mating herd — June, July and August

Autumn mating herd — February, March and April

Objectives - Condensed calving pattern.
BCS targets are met.
Manage preventable health issues.
Target weights of young stock are met.

Targets - 85% of cows at BCS 5 at calving.
Heifers at BCS 5.5.
Replacement heifers are AI bred.
Record all calving and health events.

Review - Review all calving events.

Pre-mating/Mating.

Spring mating herd — September, October and November

Autumn mating herd — May, June and July

Objectives - Tighter calving pattern.
Fewer non cyclers.
Higher submission rates.
15 month heifers ready for AI.

Targets - 90% + submission rates in first 3 weeks.
85% of cows have pre-mating heats recorded.
All non-cyclers treated 7-10 days before PSM.
15 month heifers reach 60% of live weights by PSM.

Review - After this period accurately review what happened in this period.

Mid Lactation.

Spring mating herd — December, January and February

Autumn mating herd — August, September and November.

Objectives - Pregnancy rates targets continue to be achieved
Do not compromise on BCS
Calves and heifers meet live weight targets
PD strategy to obtain Fertility focused reports

Targets - 85% of herd above BCS of 4.0
Two teams of one bull per non-pregnant cows
Young stock meet weight targets

Review - After this period is to review how the mid lactation period went.

Seasonal mating requires inputs and attention to detail and this program attempts to put some structure and accountability to the mating seasons.

In summary this is what we offer to be of assistance to clients that seasonally mate. Please feel free to contact us for more information and the tables we have developed to use for each of the four periods. M&H

The Basics Still Apply for Mating

Much has been written about mating over the years, with very little having changed with regard to the desired ultimate outcome.

Getting cows in-calf as quickly as possible has always been the goal, because of the positive influence it will have on your business in the subsequent season.

There is no single focus to achieve this, but a combination of well thought out and effective plans around:

- Calving pattern
- Heifer management
- Body condition and nutrition
- Heat detection
- Dealing with non-cyclers
- Genetics and artificial breeding practices
- Bull management
- Cow health

Calving pattern

The 6 week in calf rate, which describes the percentage of cows in the milking herd that become pregnant in the first six weeks of the mating period. The target in the New Zealand dairy industry is 78%, and there are farmers achieving this. Early rectal pregnancy testing provides the most accurate assessment. Empty rates do not give a good indication of how quickly cows get in calf so should be used in conjunction with the 6-week in calf rate. Achieving an improved 6-week in calf rate can be likened to a shift the bell curve to the left. The outcome of improving this measure is more days in milk and more days to first service.

The recent introduction of short gestation bulls to bring calving forward up to 10 days is a major boost in the armoury of farmers striving to tidy up the calving pattern and in particular, negate the likely loss of those cows that might have otherwise been induced.

Heifer management

As with much of the specific jobs we do through the year, success will be influenced by events that have happened many months or even years before – and this is no different when it comes to the mating period, none more so than with replacement stock. Most heifers are now grazed out these days, but that doesn't mean your responsibility for their performance ends when they leave the farm. Check them regularly and keep the pressure on your grazer. Make sure they are aware of your expectations.

Tools like LIC's MINDA Weights, which assess heifer progress against individual liveweight BV-based targets, will also help improve the accuracy around the target for individual animals.

As shown on the table below, there are significant gains to be made by closing the gap on actual to targeted liveweight for young stock.

Expected gains in performance when gaps are closed to liveweight targets		
	Growth from 80 to 100% of target liveweight	Growth from 90 to 100% of target liveweight
Milksolids	35.4kg	16.3kg
Calving date	-4.3 days	-2.0 days
3week submission rate	5%	1.7%
6 week incalf rate	4%	1.3%

Body condition and nutrition

Body condition score Targets of 5.5 for heifers and second calvers and 5.0 for mature cows at calving are well established as attainable and effective ways to maximise early production. Achieving these targets will also see cow condition not go too low prior to mating, given reasonable levels of feeding, and provide the best chance of a standard anoestrus period.

The influence on your herd's condition starts in autumn with drying off decisions. Failing to achieve these targets will see cows cycle later than desired, peak lower than anticipated and lower the herd's 6 week in-calf rate, thereby reducing days in milk.

Managing your feed resources through the first round should be geared to making sure you bottom out no lower than about 1800-1900 just before take-off date and you have access to or sufficient feed reserves on hand to manage that period.

Feeding is often the focus for getting cows in-calf, pasture quality is affected by how you set up and manage your farm system in late winter and early spring. The aim should be to achieve an increasing supply of high quality pasture and supplements depending on your system, to ensure cows get fed at least as well today as they did the day before.

Heat detection

As simple as it sounds, the one make or break task to any dairy system is heat detection. Get this wrong and you will be fixing the resulting ramifications for a number of years. As farms get bigger with more reliance on staff, this key area of the production year needs effective training and a high degree of competency.

The pre-mating period is a great time to assess the staff's requirement for additional training and gives you time to plan the whole mating program while capturing valuable data.

Spending time in the paddock and simply watching will allow inexperienced staff to pick all this activity up. The ultimate task of picking who gets drafted should be left to one or two experienced individuals.

Dealing with non-cyclers

The normal anoestrus period for a mature cow is 42 days, with heifers 7 days longer.

Those cows that have not cycled by the start of AI that have had sufficient time to come out the anoestrus period should be looked at. Have a plan.

In my experience there are usually many more cows dirty than you first imagine. Finding and fixing only a few additional unknowns will help pay for the exercise. As a rule, get the at-risk cows checked at least. This will include, downer cows, retained membranes, lame, assisted calvings and those that have had twins. This requires good record keeping. If hormonal treatment is planned have this done in the first week. More days in milk effectively reduces the cost of the treatment.

Genetics and artificial breeding practices

Choose your bulls wisely, avoid high calving difficulty BVs especially with young cows and choose higher fertility BV sires.

During the AI period, make sure cows mated return to the main herd to ensure you have sexually active groups (SAGs) expressing oestrus behaviour over as much of the day as possible, that way cows coming into heat will join the SAGs and the tell-tale signs of that new heat will be evident.

Be aware of what your submission rate is and start tracking NRR rate from day 22.

Bull management

Ensure that you have enough bulls to cover the herd requirements after the AB period. A ratio of 25:1 non-pregnant cows is generally accepted as sufficient, but make sure you allow spares for resting and rotating. Good bull power will ensure you are doing all you can to reduce the empty rate, and it will allow you to work toward less than 12 weeks of mating.

Cow health

Assuming you are feeding your cows fully there may be other issues around minerals that can have an impact on mating performance. Iodine is important for cows to produce vigorous heats, and selenium for helping with post-calving infections and preventing early abortions. Low copper can also reduce reproductive performance. Mineral supplementation through the springer period is predominately about preventing milk fever. In most cases the above minerals are administered as a matter of course or after vet recommendations. The other obvious factors around animal health and mating are a direct result of the calving process.

In summary, there is no magic potion to getting cows in-calf - but a combination of well thought out and effective plans will certainly help you get there.

My advice - stick to these basics, and you will be well setup for mating success.

Bevin Harris • LIC Science Leader

Genomically Selected Bulls: an update

Picking genetics during the artificial breeding season works on the assumption that, when it comes to breeding productive efficiency, farmers want new generations of replacement cows to outperform the previous generation. This comes largely down to good sire selection.

Arguably still in its infancy, genomic selection of bull calves is finally getting traction in New Zealand, where benefits for LIC's sire selection processes are emerging, and better alignment between (forecasted) genomic worth and (realised breeding) worth is the expectation.

Genomically-selected bulls have been marketed by LIC for eight years, with mixed results in the first several years. Here, we offer an insight into progress that's been made by LIC since 2013.

Using milk and TOP (traits other than production) information from a bull's daughters, it takes LIC seven years to get an accurate estimate of a bull's genetic merit, commonly referred to as breeding worth. Only after that 'progeny test' period will the bull's genetics become commercially available to the nation's dairy farmers. This is the traditional method of 'proving' a bull's value as a breeder of dairy cow replacements.

But genomic selection, using latest science methodology, offers the industry an attractive alternative proposition. "What we want to do is get a reliable estimate of genetic quality at a bull's birth, rather than having to wait seven years (for daughter information)," says Bevin Harris, LIC science leader. Bevin leads LIC's development of its genomic selection tool.

How the tool works

"The really cool thing is that, when I say 'reliable estimate', it doesn't have to be as reliable as progeny testing," Bevin continues. "Because, if you save seven years, you can actually forgo a little bit of reliability and make greater levels of genetic improvement, just by using the bulls at a younger age." That's the essence of genomic selection.

Genomic selection hones-in on a series of DNA markers that control the key traits dairy farmers are interested in (for example, fertility, fat, protein, udder support). "The idea is that we use DNA from young animals when they're born, and then drive their BW, bypassing progeny testing in the process," Bevin says. "We do this by using their DNA, specifically the DNA markers. So some markers are associated with genes that control the traits we are interested in. If we get a marker that's associated with a positive trait, we can work out whether that animal is going to be any good."

What's been the hold-up?

The method is working well in almost all dairy industries around the world, but progress has been slower in New Zealand and a few Scandinavian countries. "We (New Zealand, Norway, and Finland) have large cow populations, but our industries also feature multiple breeds and cross-breeds," explains Bevin. "When you've got one population, for example, exclusively Holstein – like in the United States, it seems to work much better. When

you start crossbreeding, you start splitting up the associations between the DNA and the traits, so you get a lot more add-mixture in the genome. It's a matter of really driving the science forward; once we deal with crossbreeds and gain a good understanding, that's the really important component in getting this thing really firing."

Recent progress

There are aspects of the technology that are firing.
Five years ago, bull calves for LIC's Sire Proving Scheme were selected exclusively on ancestry records. Now, rather than merely selecting 200 male calves to be raised and tested from LIC's Newstead bull farm, the co-operative 'pre-selects' a list of 2000 male calves. These comprise calves from cow families that have sound conformation traits, and are deemed as the most-efficient producers in New Zealand. Before leaving the farms they are born on, LIC is able to run all 2000 young sires through DNA testing, Bevin says. "We run them across the DNA chip (looking for key 'marker' traits). So we take the top-200 or 250 (from the initial list of 2000), for the Sire Proving Scheme.

Sire acquisition managers will visit farms throughout the country to eyeball the 200 to 250 bull calves (and their dams) before confirming their place in the Sire Proving Scheme. "That's a really big change from what LIC used to do," Bevin says, "which was select our top-200 based on the parent average (the BW index)." Bull composition is different under the new method: "There's much more choice, a wider range of bulls," Bevin says. "Looking at a list of 2000 sires allows us to open the way for a small number of animals that might not have otherwise come on the radar. We can take more of a punt based on relatively good genomic values. It's de-risking the process, because we don't have to bring young animals to the centre and find that, for example, five are not up to standard. We're also doing more embryo transfer work. This helps, for example, if you take two identical full brothers who have identical parent averages: You can use the DNA information to show differences – one might have better associations in the traits we're interested in, so we'll take him."

What about the girls?

The co-operative is also using a lot more heifers to generate bulls.

Previously, LIC had to wait until cows were milking to get an idea of how good they were, before using them as mothers of bull calves. Nowadays LIC gets samples of the heifers' DNA, generating breeding values before the heifers have calved: "So that speeds things up again (intensifying the selection); we're turning generations over," Bevin says.

Promising Signs

In 2013, LIC made a significant change in the method behind genomic selections, including the mathematics behind it: "What we're trying to do is to improve the stability of the difference between what we say the animal's going to be (based on DNA information) and what it finally comes out at (when daughter information comes through). Ideally the numbers would be the same, Bevin says.

"We don't want to over-promise on the genetic level of these animals, or over-promise on the accuracy we think we're getting from the genomic Breeding Worths. LIC is also using a different system to calculate the association between genomic markers and the traits farmers are most-interested in: milksolid production, fertility, and survival. And more work is being done on non-BW traits, (Traits Other than Production, TOPs), such as udder support, to help with selections. Significant emphasis is now placed on TOPs; this is up from a 40% weighting to 60%, Bevin says. "It's increasingly important to have udders that will last the distance and help with longevity in the animals."

With regard to the bulls that were genomically-selected in September 2013, Bevin says LIC should see them "holding up". "But we won't confirm that for another two years, because of the seven year time lag that happens when you're waiting on daughter information to come through." In the immediate term, the co-operative would put a good degree of focus on top-end genomic selections. "Pre-selection is working, and we're seeing results in the RAS List right now. "Instead of having a group of sires below zero (ie. falling short of initial genomic predictions when daughter proofs emerged), they're not there anymore," Bevin says. "In other words, the ones that inherit poor genes from their Mums and Dads, we're not picking those up anymore. When our genomic selected bulls start to get their information through, they're actually dominating the RAS List. I've never before seen the sort of domination LIC got last year."

If improved rates of genetic gain are achieved, more-profitable cows for farmers will result, Bevin says. "The other benefit, from a company point of view, is that if we're getting improved rates of genetic gain, we're getting more top bulls on to the RAS List than our competitors." (M&H)

VIKING HOLSTEIN

wêreldleiers vir vrugbaarheid uiergesondheid en vastestof produksies!

My keuse van drie bulle vir 'n doelgerigte teeldoelwit

Viking Holstein bestaan uit die gesamentlike populasies van Denemarke, Finland en Swede. Die produksie gemiddelde van 584 000 koeie is 'n indrukwekkende; **10 054 kg 4.03% bv 3.37% prot 405 kg bv en 340 kg proteien.**

Die teeldoelwit word omskryf deur 'n ekonomiese indeks nl. **NTM. Produksie (melk bv. en prot.) vrugbaarheid en uiersgesondheid**, dra die grootste gewig in die indeks. Die Skandinawiese lande het reeds meer as 30 jaar gelede begin om waarde eienskappe soos ook onder meer mastitis weerstand en lanklewendheid in hul teeldoelwitte in te sluit. Die nuuste Interbul data bevestig hul voorsprong op die gebied. **Die uitkruis moontlikhede** van die genetiese bron, is verder die rede waarom al hoe meer populasies Viking bulle gebruik as 'n alternatief.

In 2016 het ons op 'n besoek aan Denemarke kuddes besoek en vervolgens die produksie data van 2 van die kuddes. Opvallend was dat die stambome byne 100 % van Viking bulle was:

Gunnar Forum: 430 koeie 13595 kg 3.61 % bv 490 kg 3.44 % prot 468 kg (959 kg V+P)

Martine & Sjoerd Ydema: 425 koeie 11495 kg 4.18% bv 481 kg 3.42% prot 393 kg (874 kg V+P)

Beproefde bulle

VH OSMUS (D Onside x V Exces) NTM 20

Osmus is geteel deur Asmussen en Kaczmarek in die suide van Denemarke. Sy moeder se produksie spreek boekdele - gemid prod. van **11994kg 4.26 en 3.57 oor 4 lakt. Die ouma : gemid. oor 5 lakt. 14907 kg melk!** Op die foto regs kan sy koei familie gesien word, steeds in produksie !

Uitstekende produksie en waarde eienskappe is 'n kenmerk van die bul. Nie net is hy positief vir al die produksie eienskappe nie maar is hy ook vir **vrugbaarheid, uiergesondheid, lanklewendheid en hoefgesondheid.** Die 2097 dogters in sy ontleding is koeie met onder gemiddelde grootte en uitstekende uiers. Hierdie bul is 'n tipiese voorbeeld van die **talle uitkruis stambome** wat beskikbaar is. Gebruik hom op koeie wat reeds te groot is ('n probleem in die ras vir veral weidings toestande) asook waar kuddegesondheid 'n hoë prioriteit is.

Moeder, ouma en groot moeder van Salomon

Miracle dogter

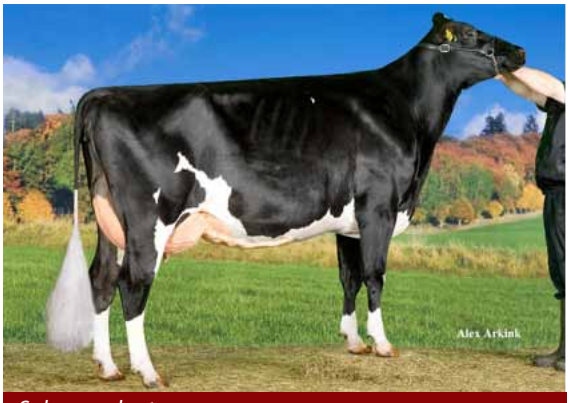
VH MIRACLE (Massey x Roumare) NTM 19

Miracle is geteel deur Anderstrup Holsteins en sy 8669 dogters is 'n bewys van die gewildheid van die bul - reeds as 'n genomiese bul. Sy moeder se beste lakt was 14709 kg 4.36 % bv en 3.64 % prot. Baie hoë indekse vir veral **uiergesondheid, (109) lanklewendheid (116) en hoefgesondheid (113)** is die rede waarom hy so gewild is.

Miracle teel dogters van **gemiddelde grootte** met veral **baie goeie uiers**. 'n **Uierdiepte van 118 en vooruieraanhegting van 111** verseker dat hy wyd gebruik kan word. Baie goeie **konsepsies** is in Australië met Miracle behaal.

VH SALOMON (D Sammy x Oman Justy) NTM 18

Die moeder van Salomon het uitstekende produksies behaal. Haar beste lakt: **10584 kg met 5.02 % bv en 3.72 % prot!** Salomon teel dogters met gemiddelde produksies maar sy **prot indeks van 121 en bv van 119** onderstreep hierdie bul se vermoë om die steeds dalende vastestof persentasies van Holsteins aan te spreek. Sy meer as 3847 dogters se sterk punte is veral uitstekende hoefgesondheid, ideale kruise en besonders sterk aangehegte uiers. Gebruik Salomon om dogters te teel met hoë vastestof persentasies en goed aangehegte uiers.



Salomon dogter

AMADLELO AGRI

TOGETHER WE GROW • TOGETHER WE REAP

Genimex™

LIC

Amadlelo, Livestock Improvement NZ and Genimex are proud to announce a co-operation agreement.

The Amadlelo AGRI initiative has the objective of empowering previously disadvantaged people of the country into positions of ownership and management and backs up the South African Land reform program.

The initiative under the leadership of Jeff Every the CEO and founder develops large scale dairy farms with the co-operation of the community, the South African government and the commercial dairy farmers.

There are currently six of these operations that have become self sustaining dairy farms. These herds scattered throughout the Eastern Cape are self sustaining and there is a continual move to develop more communal land and water recourses that are under utilized.

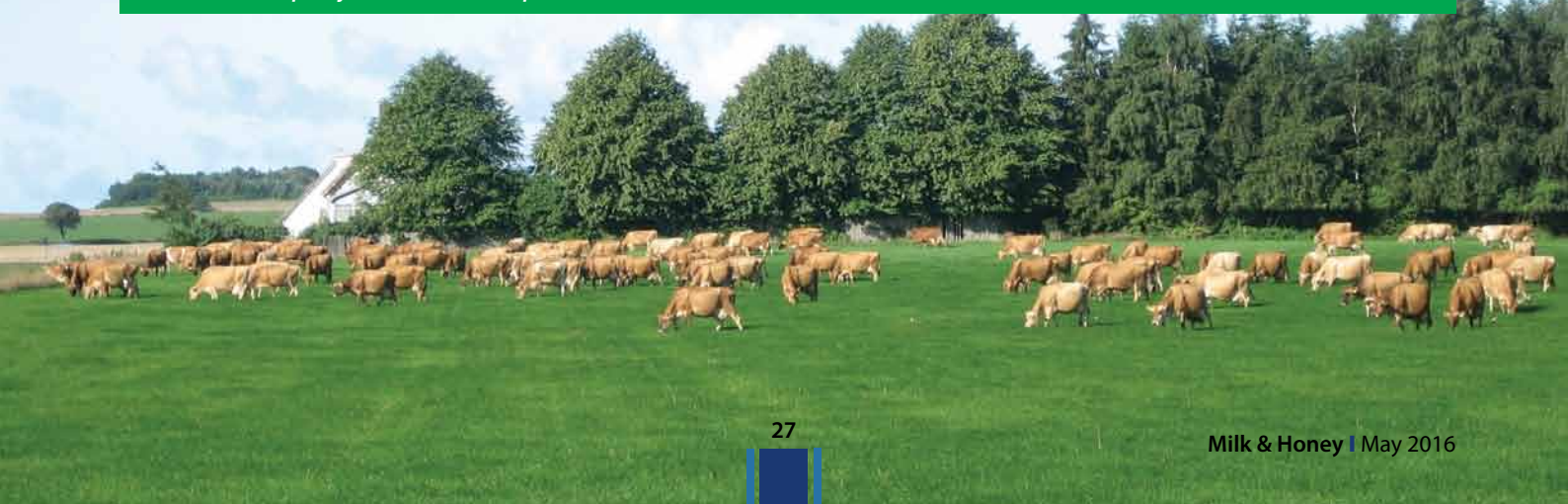
As with any dairy operation there is a need to continually train staff and this is where the need for the co-operation between the parties was identified. The production systems in these herds is based on producing milk off grass and it was clear that to tap into the New Zealand system was the obvious way to go.

Initially the support that the staff of Genimex supplied to these herds was in the form of AI training, assisting with managing mating seasons and heat spotting. However with the assistance of LIC there was a lot more to offer.

The program is now entering its third phase. Phases one and two are well underway as the first two managers, Leonard Mavhungu and Jeanet Rikhotso visited New Zealand last year together with Hendrik Bezuidenhout and Britt Stanton of Genimex.

Ken Bartlett of FarmWise has already visited all the herds at least three times. The two junior managers that will be doing their internship have been identified and will soon depart to work on large dairy farms on the South Island of New Zealand.

Leonard Mavhungu and Jeanet Rikhotso managers at Amadlelo together with Hendrik Bezuidenhout and Britt Stanton of Genimex, at OR Tambo airport just before their departure for New Zealand.

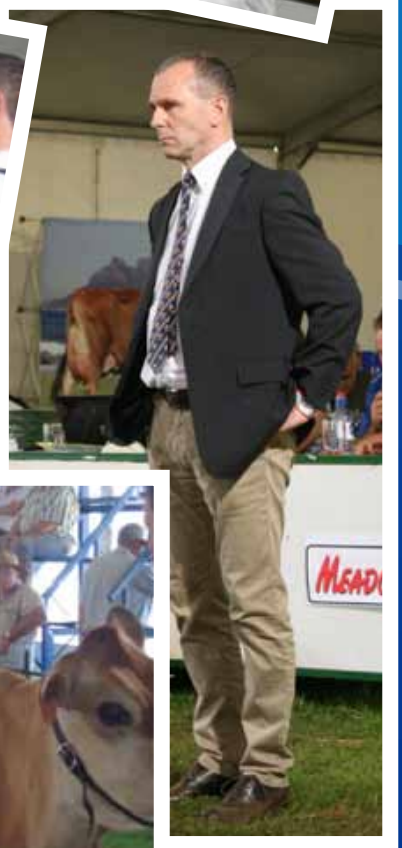


Peter Larson

of Viking Genetics judging the Jersey National Championships 2016





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