

JOIN US IN THE NORDIC CATTLE DESIGN AND INNOVATION



Join us in the Nordic Cattle Design and Innovation

IMPROVE YOUR PROFIT THROUGH BALANCING
PRODUCTION AND HEALTH WITH NORDIC GENOMIC
BREEDING VALUES!

Why join us?

Nordic dairy farmers in Finland, Sweden and Denmark have specialized in breeding for better health since 1980s. Get more profit from healthy cows - rely on our unique Nordic Health traits in Nordic Total Merit, NTM.

Genomic breeding values on Nordic scale give you the value of the “invisible” health traits. With the genomic test using the Nordic system, you get the most profitable cow in the world.

Made by farmers - Used in management and breeding
The secret behind the Nordic farmers’ success is their willingness to register all traits including health. Farmers in Nordic countries are fully committed to the registration system as they use it for managing and breeding in their herds.

What is in it for you?

Nordic Cattle Design and Innovation help you identify the animals with the highest genetic potential that suit your goals and deliver the greatest improvement in next generation in your herd.

Until recently, this service has only been available to Nordic farmers. Nordic Cattle Design and Innovation now makes it possible for commercial dairy producers and A.I. companies all over the world to benefit from our system.

We have a substantial number of cows for having a competitive full-scale breeding program for our three dairy breeds – Red Dairy Cattle, Holstein and Jersey. Nordic farmers are highly professional being among the countries with the highest average milk yield in the world. We offer you the outcome of our entire registration and breeding system in Nordic Cattle Design and Innovation.

SECURE YOUR HERD’S GENETIC FUTURE!



Genomic breeding values based on huge amounts of reliable data

Registrations in the Nordic countries are the cornerstone in herd management. At the same time, they are a unique base for estimation of genomic breeding values and national health programs.

Nordic tradition for collection of data

- Milk, fat and protein in decades
- Calving ease since 1982
- Health treatments since 1984
- Linear classifications since 1990

On the edge with new data from a variety of sources

- Hoof trimmers
- AMS systems
- Novel lab tests
- Feed uptake equipment – near future

Farmers do precise registrations. Their motivation to make registrations is to be able to calculate key figures that are used to monitor the herd. This is a management tool to optimize profit. Through management programs dairy farmers can benchmark own results with other farms.

The trend in the Nordic countries is that the application of on-farm electronic equipment that measure traits like daily milk, milk content, activity, teat coordinates and feed uptake is increasing. Lab test of milk content is also evolving in relation to traits like content of fatty acids and ketone bodies. This trend pushes in direction of larger amounts of data and data that are more objective and precise.

Data are stored in national databases and is cleaned in several steps from farm to database. Errors are corrected in the first step on farm by milk recording technicians in collaboration with farmers. In the next step rules that are part of the database detect and correct errors before storage.

A cornerstone in reliable registration is that each cow has a unique ID from birth to slaughter.

All these efforts are done to ensure the best ground for management and breeding decisions. We use all the data for calculation of reliable traditional and genomic breeding values.

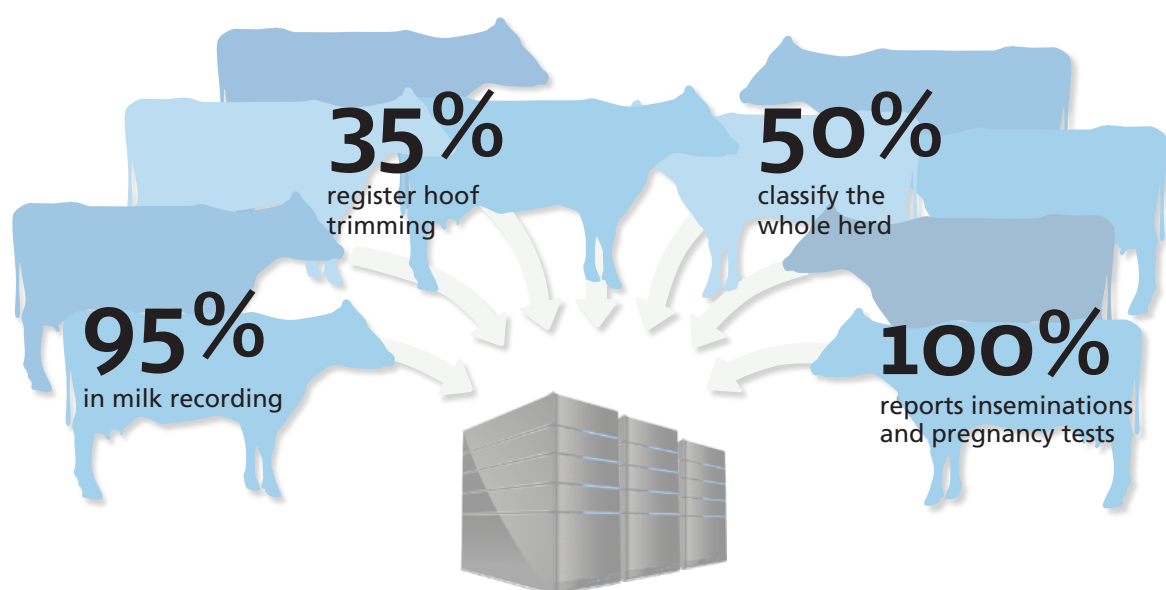


Figure 1 Proportion of herds participating in registration

Base for Nordic health and welfare

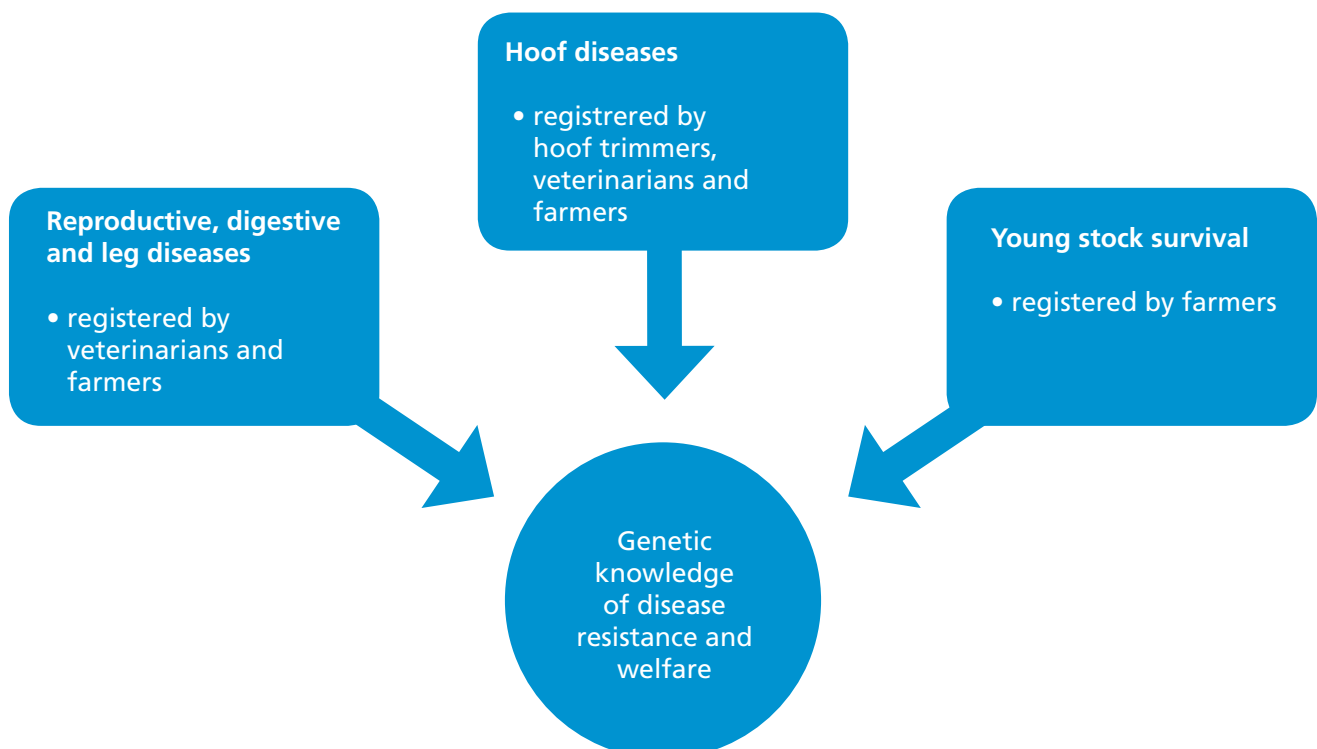
In the Nordic countries, we register traits that make us unique. These traits describe welfare and health in calf and cow and they make a difference for cow, farmer and consumer.

The challenge with health is that registrations are difficult to measure objectively like milk yield and conformation. Therefore, much effort has been done in relation to standardizing the definition and recording of diseases. In relation to hoof health, a common description of diseases is available in a "Nordic Claw Atlas" and further veterinarians, hoof trimmers and farmers have been educated.

For health diagnosis, strict rules are applied, and only data from herds that complies within these rules are used in estimation of breeding values. Veterinarians diagnose cows or are involved in supervising farmers how to diagnose. This gives a high level of reliability in data.

Hoof trimmer data are the newest source of disease data. Nordic countries have developed and implemented an efficient on-line registration system. It has been positively received by farmers, hoof trimmers and advisers leading to a high registration level.

The success with the hoof trimmer on-line registration system is a result of integration of implementation and development. After development of the system for hoof health in 2010, more than 1.000 herds participated in registration in the first year.



Development of Nordic Total Merit, NTM since beginning of the 80'ties

Development of NTM is the story of getting a more holistic and sustainable breeding goal where all economic important traits are included. Since the start, more and more traits have been added and this has enhanced the economic value per index unit of NTM. Feed Efficiency will be implemented in coming revision of NTM.

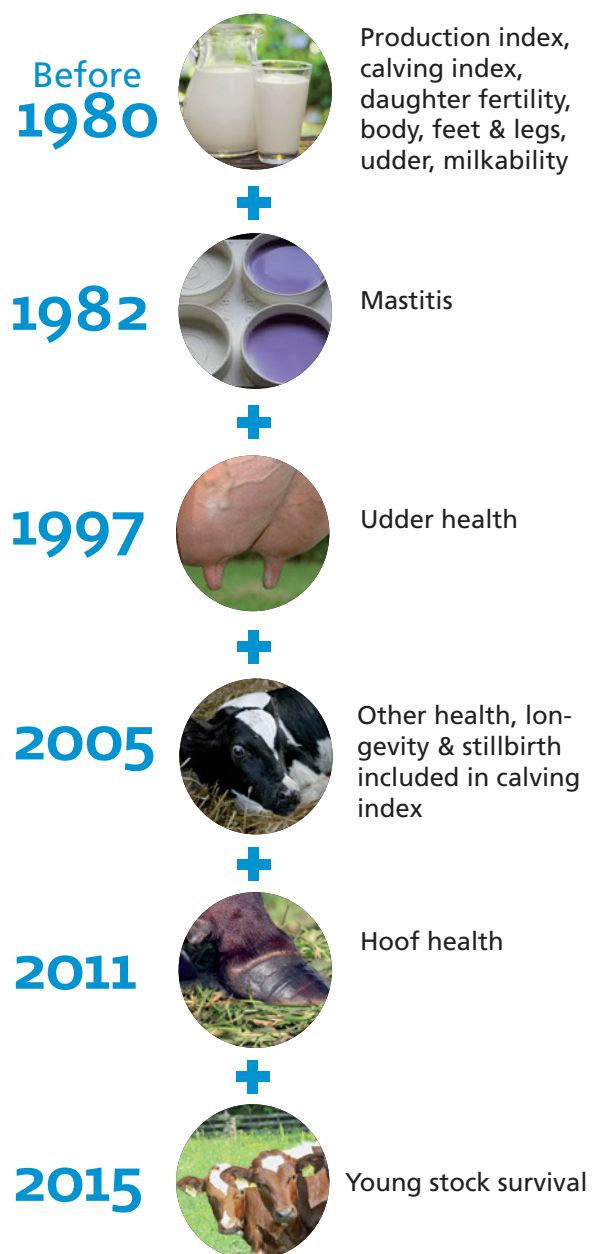
NTM include many functional traits like Udder Health. Despite that these traits have a negative correlation to yield it has been possible to achieve genetic progress simultaneously for both yield and function.

An increased weight on functional traits in NTM over years is a big success due to increased awareness of cost in dairy production. Farmers manage to have less cost per kg produced milk. Today farmers know that healthy and robust cows may be invisible, but they give the highest profit.

Economic values of each trait in NTM are based on market prices and calculated using advanced models. These values are used to calculate marginal return for all traits. The breeding goal reflects farmers' need for selecting profitable cows.

NTM is a comprehensive breeding goal including many traits - both production traits and functional traits. NTM is also complex, this is a natural thing that we know from other technologies that have developed over time like tractors and milk machines.

Newest calculation methods and chip technology ensure highest possible genetic progress for all traits in NTM. Genomic Selection has enhanced possibilities to go for a balanced breeding goal. This is because of two things: firstly higher reliabilities for health traits and, secondly same reliabilities for all traits in the breeding goal for both newborn heifers and bull calves.



Cattle health is a global issue



”We focus on prevention of milk fever in our herd. This is crucial for securing high profitability of our business.”

OLE SØRENSEN, RAVNINGGAARD JERSEYS FARM (440 COWS), DENMARK



”Hoof health is crucial. Having a cow lame or not willing to walk because of the pain, leads to a quick loss of body condition, dramatic loss of milk production and makes it very difficult to catch her in heat.”

DIEGO SIERRA CALDERÓN, "LA GARCIA" FARM, (150 COWS), COLOMBIA



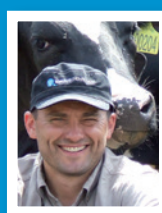
”Hoof health is in fact a problem on our farm, actually it is our worst health issue, otherwise our cows are normally very healthy and fertile. We have recently installed a special foot-bath, where young stock and dry cows will be passed regularly to try to diminish actual treatments. Hoof health has obvious influence on our economy: treatments, loss of production, sometimes loss of animals.”

AVENDAÑO ELISABETH, "SAN FELIX" FARM, (400 COWS), ARGENTINA



“Lameness is the most expensive health problem in our herd. Our profit drops due to losses in the milk production, and this problem is costing us a lot of time, money and effort.”

EKATERINA LISICHKINA, CHIEF VETERINARY AT “NOVO-LADOZHSKIY” DAIRY FARM (1400 COWS), RUSSIA



“I need healthy and functional cows with minimum problems for my herd. Such ones I don't know about. Such cow brings a profit and pleasure to me.”

VACLAV RUZICKA, PIAS SUCHDOL A.S., (600 COWS), CZECH REPUBLIC



“Mastitis, especially the sub-clinical mastitis causes the biggest economic loss on our farm - treatments, drop in production, at times loss of animals. The best farm can control the mortality under 2%”

FARM WITH 5000 COWS, CHINA



“Mastitis is the most severe problem in our herd. It has an impact on the milk production and the amount of replacement heifers you have to raise.”

ARNO KRUGER, SANDDRIFT TSITSIKAMMA (1650 COWS IN MILK), SOUTH AFRICA

Much more than breeding values!

Sustainability and low risk breeding are extra value you get when using Nordic Cattle Design and Innovation. This guarantees you a safe choice.

The Nordic reference population, consisting of both genotyped national and international progeny tested bulls and cows, covers a wide range of pedigrees. Genotyped cows from the Nordic production herds are continuously added to the reference populations in all breeds in large numbers. This ensures that you always get breeding values with high accuracy for all traits in NTM.

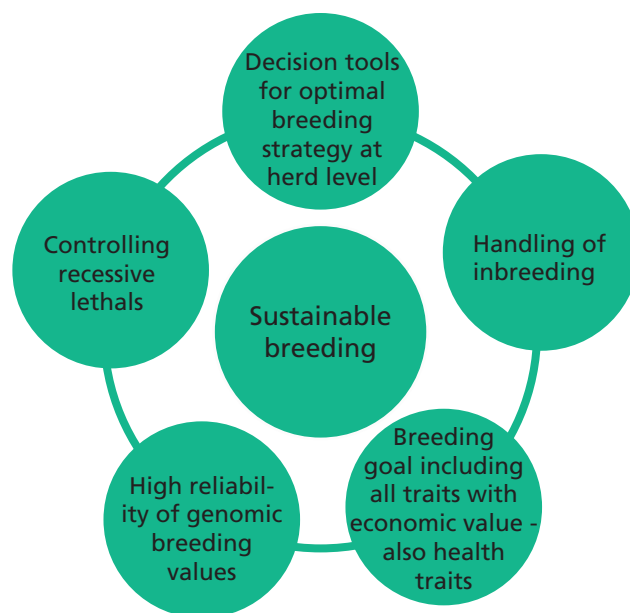
Our customized SNP chip is specifically developed for our Nordic Cattle Design and Innovation, with valuable SNP markers for all traits in NTM, especially Nordic health traits.

You get the full declaration for all the recessive lethals that we know about. Information that helps you to avoid combinations of carrier by carrier mating at herd

level. This is possible because we have the detailed data collection for various fertility and survival traits and intensive registrations of abnormalities of newborn calves.

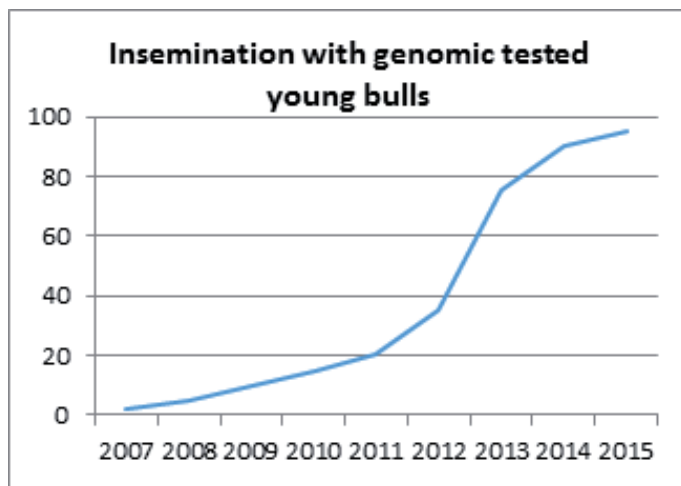
We can also offer you a wide range of tools to optimize breeding decisions in your herd. Our software can handle individual weighting of traits in NTM and inbreeding in your herd.

Low risk breeding and high sustainability guarantee you a safe choice.



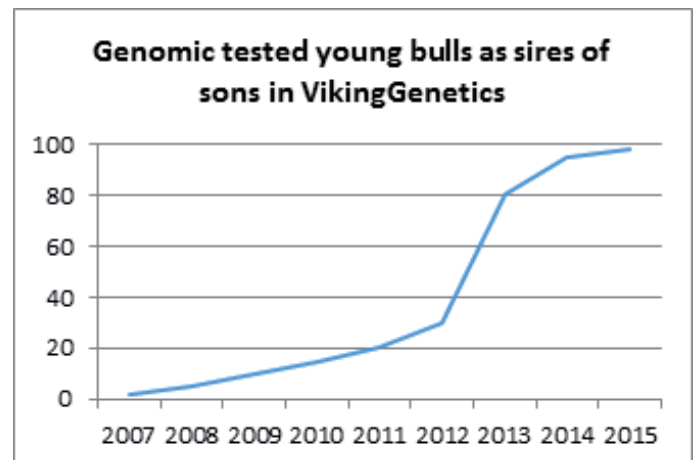
Nordic farmers and VikingGenetics have great trust in genomic breeding

Genomic selection has changed breeding. In the Nordic countries use of young sires with breeding values based only on genomic information have increased rapidly during the recent years. This is because farmers and VikingGenetics believe in genomic breeding values and act accordingly.



”I only use young bulls, because I have great trust in Nordic breeding values. I trust because the system is built on reliable data and thorough research. Further skilled advisors help me getting the most genetic progress. Nobody can tell with 100% certainty if cows are better, but in our herd we have fewer cows that we have to cull young. So I would not go back to using proven bulls.”

MORTEN HANSEN. FARMER IN DENMARK WITH 375 HOLSTEIN AND RDC COWS



”Selecting sires of sons based on genomic information gives much higher genetic gain. This is a fact that we cannot ignore. Therefore, we use young genomic tested sires intensively in order to be competitive. Nordic Cattle Design and Innovation is the obvious choice because it gives breeding values also for health traits with high reliability and the best economy for farmers.”

CLAUS LANGDAHL, HOLSTEIN SIRE ANALYST, VIKINGGENETICS

In the near future when the price on a genomic test drops further, more farmers will use genomic information as a management tool to select females within herd. When farmers inseminate the females with highest NTM with sexed semen and the females with lowest NTM - with beef semen the average NTM in the herd will increase. This gives cows that are more profitable.

Improve your profit with the Nordic health profile!

NTM is a genetic tool for selection of animals with highest economic potential due to genetics. Within herd farmer can select the dams of next generation of heifer calves and AI organizations can select future AI bulls. NTM forecasts total genetic value in Euros. This is the sum of the weighted value for all economically important traits.

NTM is the cow's total revenue due to genetics expressed in Euro under Nordic conditions. The total revenue is coming from production of milk and beef, subtracted costs for labor, treatments, insemination etc. For Holstein 1 NTM unit has a value of 10 euro per year.

NTM is based on Nordic production circumstances and market prices. In other countries production conditions and prices can be different and then the value of NTM might be different. However because both income and expenses are important in all countries NTM will always be the reliable way to select the most profitable cows.

The economic value of NTM is not exactly the same for Red Dairy Breed and Jersey as for Holstein due to differences in genetic variation and economic marginal revenue for all traits in NTM.

The weights in the breeding goal sets the direction like a GPS. NTM is the direction for the breeding strategy in your herd.

Extra Value for a Holstein heifer

For two Holstein heifers with a difference of 10 NTM units the superior heifer is expected to have an extra profit of 250 € during its lifetime.

Profit in breeding at herd level

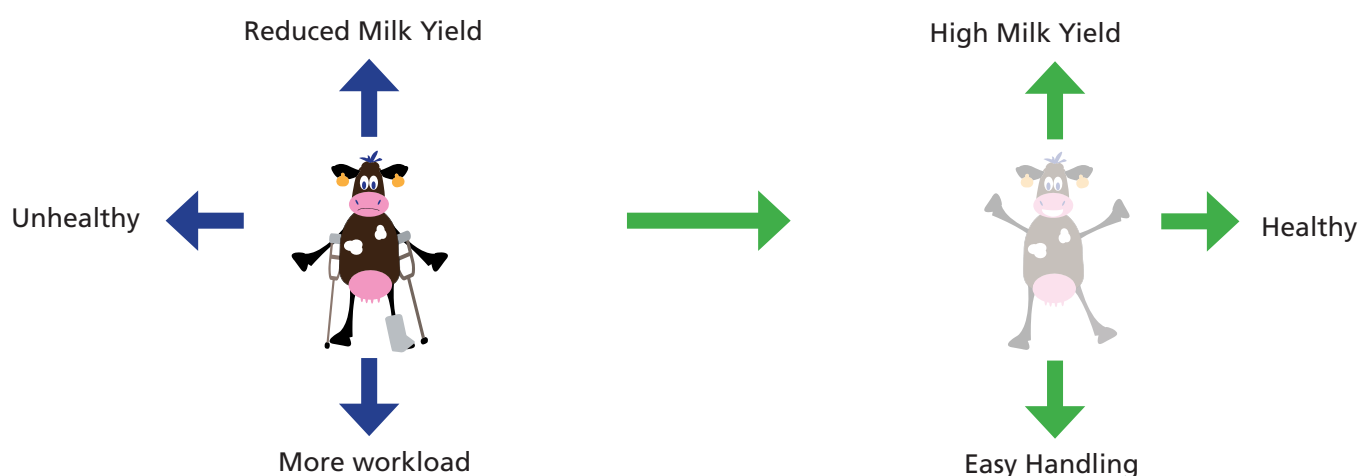
For two Holstein herds with 200 cows and a difference in average NTM of 10 NTM units., the superior herd will have a yearly extra economic profit of 2.000 € for the total herd.



Economic value of Nordic Traits – Other Health, Claw Health and Young Stock Survival

The “Invisible cow” is a cow that has a high production and free from health problems. Further, it is easy to handle in daily milking and is pregnant at first insemination.

“Trouble cow” and “Invisible cow”



We provide you with unique information about the traits that gives you less trouble and less work – the more profitable cow. For instance will 10 index units give you 8-13 extra Euro per year for just one health trait:

Economic value of one index unit for Holstein

Other health:	1.2 Euro
Claw Health:	0.8 Euro
Young Stock Survival:	1.3 Euro

The purpose of indices for Other health and Claw health is to increase resistance towards reproductive, digestive, hoof and leg diseases. Economic value are due to:

- More delivered milk to the dairy
- Less costs for work and treatments

Young Stock Survival is a “Health index” for young animals. The purpose is to have more bull or heifer calves surviving during rearing period. Economic value of Young Stock Survival is due to:

- Increased growth in heifers and bull calves
- Less cost of feed and work

Nordic Cattle Design and Innovation give focus on management and breeding in your herd. It sets new standards and is ahead of international trends on development of Health traits. We are ahead because of a short distance from R&D to implementation. One example is farmers trust in Genomic Selection with nearly 100% use of Young Genomic tested bulls.

Achieve your goal most directly by Nordic Traits – Longevity do not explain it all`

Health traits explain precisely what the reason is for short productive life. Therefore, select directly for Health traits to improve the traits that matter in your herd. Longevity is a mixture of many traits and selection for Longevity does not help you to improve specific traits. Selection for Health traits help to reach your herd goal and to have more profitable cows.

“In breeding you get what you go for” – Nordic Cattle Design and Innovation emphases focus on balanced breeding to get most profitable cows. Health traits add extra value to your wish to have high milk production with problem free cows.

NTM gives full declaration for economic important traits. Nevertheless, if you have a special challenge in your herd, you have to find a “Tailor-made solution”.

NTM gives you overall direction for profitable cows and then you have to correct for your special needs for better Health traits in your herd by using GPS for Health traits.

Longevity do not explain it all` - if you want to improve Hoof Health you can select bulls with +10 index units for Claw Health and get 8 Euro extra genetic improvement per year in your next generation of milking daughters.

With a customized weight of Health traits in NTM, you can make the solution that suit best for your herd. All herds are different and therefore you have to go directly

GPS for Health traits



Goal is better:

- Hoof
- Other Health
- Young Stock Survival

“Direct route with selection of health trait is more efficient than alternative route with use of Longevity”



Nordic breeding values improve health

Fewer diseases gives you better economy. We can prove the effect of Nordic health indices using real data coming from farmers' registrations. Results show that among cows with high indices for Claw health, up to 5% less have hoof diseases.

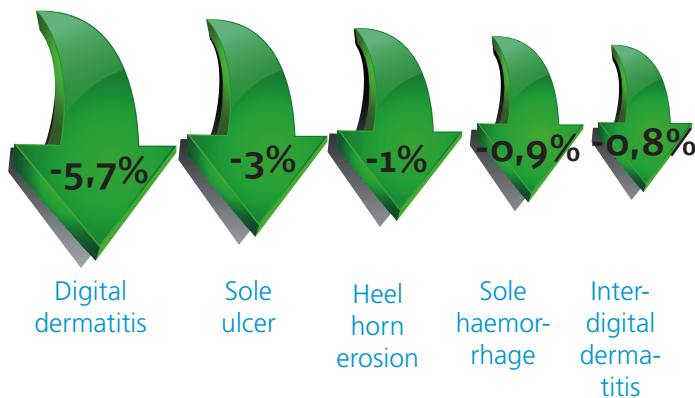
We have analyzed the pure genetic effect of indices for Claw health and Other health traits. In figure 1 and 2 the difference in incidence of diseases in 1. lactation between cows with high versus low indices are shown. Similar results are found in 2. lactation.

In the analyses the average difference between cows with highest and lowest index where 9 index units for both index for Claw health and index for Other health traits.

The results show that breeding for cows with higher genetic level for disease resistance will reduce incidences of disease considerable in your herd. For Digital Dermatitis frequency is over 5% lower for cows with high genetic level.

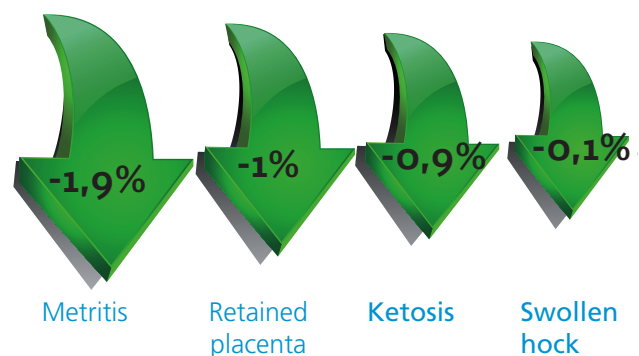
With Nordic Cattle Design and Innovation you get the possibility to breed in direction of better economy and welfare due to fewer diseases. This benefits both your cow and you!

Figure 1 Difference in incidence of diseases in 1. lactation between cows with high versus low index for hoof health



In the analysis, cows are divided in two groups within herd - half with highest pedigree index and half with lowest. Within herd the incidence of diseases in each group is used to calculate difference between groups. Finally, average is calculated across herds.

Figure 2 Difference in incidence of diseases in 1. lactation between cows with high versus low index for other health traits



Hoof health expands the knowledge and changes the choice of bull

Testimonial Lars Nielsen, Head of Breeding,
VikingGenetics



“For several years dairy farmers have been using feet and legs conformation as the primary indicator for a cow's ability to stay mobile and productive. But with the introduction of Claw health index, dairy farmers have

got stronger tool to create mobile cows via breeding.

Claw health index explains more about longevity than index for Feet and legs. Further, the two traits - Claw health and Feet and legs are different, due to differences in physiological background.

And it has not been difficult for Nordic dairy farmers to accept the Claw health index – as seeing is believing. A good example is the two heavily used Danish Holstein bulls VAR Etlar and V Curtis with respectively 15,000 and 23,000 milking daughters – starting before Claw health index was introduced.

Expectations were very high to the good looking VAR Etlar daughters when 2nd crop calved in. He had high NTM and great looking daughters with excellent feet and legs and good production. A potential new matador like T Funkis we thought.

V Curtis had also been used a lot - mainly because of high production – but feet and legs were far below average – so we did not expect any good longevity. But what happened: Etlar daughters disappointed – they did not produce as expected and did not stay in the herds. We got the info that something was wrong with the hoofs and too many cows were lame.

The V Curtis daughters did not look well with swollen hocks and low hoof angle. But the cows did not have any problems to stay mobile and they stayed in the herds for long time.

The answer came when Claw health index was introduced in 2011. Etlar had one of the lowest Claw health indices in the breed at 72 and V Curtis one of the best Claw health indices at 123 – and farmers told us that this exactly reflected their experience from the barns.

Since then we have got several similar examples and we normally see the daughters from high ranking hoof health bulls being very popular in the herds. And opposite – daughters from bad hoof health bulls will rarely be favorite cows. For that reason Nordic farmers pay great attention to Claw health index on bulls when they are looking for the problem free cows.”



Photo: Elly Geverink

Contact for prices and more information

Calculation of Genomic Breeding Values for Females or Bulls for Nordic Health Traits,

Please contact Nordic Genetic Cattle Evaluation, NAV or VikingGenetics:

NAV contacts for ordering GEBV's for Nordic Health traits:

Gert Pedersen Aamand, gap@seges.dk
Phone: +45 8740 5288

VikingGenetics contacts for ordering GEBV's for Nordic Health traits:

Dorthe L yngby Larsen, dolar@vikinggenetics.com
Phone: +45 8795 9428

Females - Prices for Calculation of GEBV's for all traits in NTM including Health Traits for Holstein, VikingRed and Jersey:

- 25 Euro per female – genotype and pedigree delivered electronically by organization
- 40 Euro per female – genotype and pedigree delivered by farmer
- 65 Euro per female – DNA-sample delivered by farmer

Bulls - Prices for Calculation of GEBV's on Nordic Health Traits (Hoof health, Other health traits, Young Stock Survival) for Holstein:

Bulls older than 10 months (Not for publication): 150 Euro per bull – genotype delivered by A.I. Company

Bulls older than 10 months (For publication): 1 Euro per sold dose minimum 2.000 doses – genotype delivered by A.I. Company

If you want GEBV's for bulls for other traits in NTM you also have to pay EuroGenomics, FEE.

