

NAV introduces an index for Saved feed with maintenance efficiency as a first step

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At the genetic evaluation in August 2019, NAV will for the first time publish breeding values related to feed efficiency. There will be a new sub-index called Saved feed, which is an index that in the future will include two breeding values, maintenance efficiency and metabolic efficiency. In August however, only maintenance efficiency goes into the index, but metabolic efficiency will follow as soon as development work is finalized. Saved feed gives you as a dairy farmer the opportunity to breed for cows that are more feed efficient.

Many countries have focus on establishing a genetic evaluation for feed efficiency, to be able to select for more feed efficient cows. Some countries have already introduced breeding values for feed efficiency whilst others are on their way to do so. In all countries we will see breeding values with low reliabilities for feed efficiency traits, due by the low level of individual feed intake data.

NAV has developed a Saved feed index that will consist of two breeding values; maintenance efficiency, which captures the energy requirement for maintenance, and metabolic efficiency, which reflects how well the eaten feed is utilized. The breeding value for maintenance efficiency will be published in August 2019, while the breeding value for metabolic efficiency is expected to be launched in winter 2019/20.

Less feed costs with less heavy cows

It is a fact that heavy cows eat more to maintain themselves than lighter cows. This also means that from a feed efficiency point of view, lighter cows use less feed for maintenance. With the new breeding value for maintenance efficiency, daughters of two bulls having a difference of 20 index units will have a difference in dry matter intake of 60-80 kg per lactation.

The breeding value for maintenance efficiency is based on different measures of live weight. Heart girth measurements from Finland are used together with scale measurements from Denmark. Since we only have a limited number of cows with these direct measurements, we also use the conformation traits stature, body depth and chest width from all three countries in the evaluation. This is because these traits have a rather high genetic correlation with live weight and are therefore good indicator traits. Because of the quantity and quality of the data and a fairly high heritability, both proven AI-bulls and young bulls with a genomic test will get a high reliability for this breeding value. The case is the same for cows with own registrations for body weight and/or conformation and for genotyped heifers.

Smaller cows are more functional

Maintenance efficiency has a strongly unfavorable correlation to the sub-index frame, which is not surprising, because frame reflects the size of the cow. Furthermore, it has also been found that smaller cows are genetically better for longevity and claw health. The correlation between breeding values for maintenance efficiency and NTM and yield index production is close to zero.

Metabolic efficiency is the next step

Maintenance efficiency doesn't tell anything about how efficient the individual cow utilizes the feed she eats. To be able to say something about that, we need individual feed intake records in large scale. This is currently difficult and very expensive. However, it seems to become possible to get more registrations from Nordic dairy cows with the Cattle Feed Intake System (CFIT) developed by VikingGenetics. Results from this system looks very promising, but it is presently only in small scale and it will take some years to get data for a large number of cows. Meanwhile we have the possibility to use feed intake data from research farms in the Nordic countries together with data from around Europe and North America. These data will be the basis for a breeding value for metabolic efficiency in the beginning but more data from commercial herds will be included as soon as it is available. Even though we work together across borders the amount of data is still limited, and the reliability of this breeding value will therefore initially be very low.

Large focus on feed efficiency worldwide

The Nordic countries are not the only countries with focus on feed efficiency - it has been a hot topic worldwide the last years, and many countries have established or will establish genetic evaluation for feed efficiency. However, the weak point for all countries are the limited number of feed intake records that results in low reliabilities on genomic breeding values. Therefore, some countries have started to use different kinds of equipment that can measure feed intake for the individual cow. Furthermore, countries are joining consortiums and are sharing feed intake data, to get started with a genomic evaluation for feed efficiency.

Decreasing trend for maintenance efficiency

Results show that the genetic trend for maintenance efficiency (figure 1) has been decreasing in the past decades – as a consequence of cows becoming larger and heavier. This follows the increased stature of cows observed in practice. The genetic trend towards larger/heavier cows is not directly caused by the selection for NTM, since the correlation between NTM and maintenance efficiency is close to zero. It possibly reflects however, that bulls and especially bull dams are selected not only on NTM, but also with some emphasis on frame.

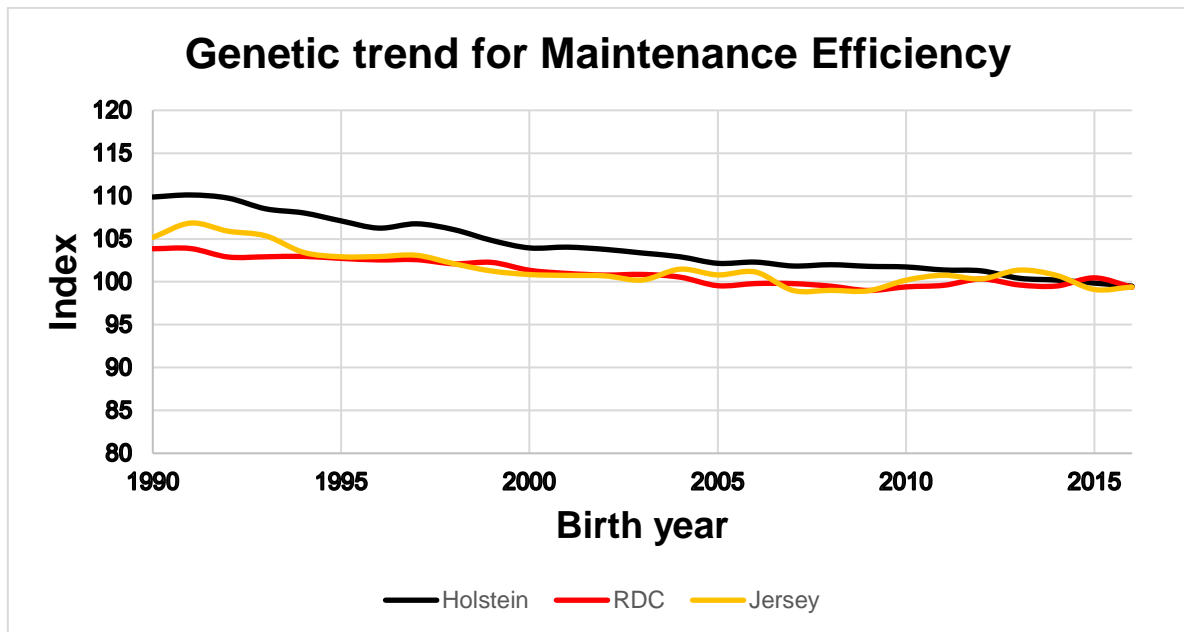


Figure 1. The genetic trend for Holstein, RDC and Jersey cows with body weight or conformation measurement on standardized breeding values.

Perspectives for an inclusion of Saved feed in NTM

The genetic evaluation for Saved feed index gives us the opportunity to include the trait in NTM. This gives sense from an economical point of view, because 88% of the variable costs on a dairy farm relates to feed costs. In the autumn 2019, NAV will calculate the economic importance of Saved feed in NTM. Thereafter, representatives from the different breed organizations from all three countries will discuss in early 2020 if Saved feed should be included in NTM.