

Possible to breed for reduced feed costs in milk production - now also in the US

By Rasmus B. Stephansen (SEGES, NAV), Terhi Vahlsten (Faba, NAV) and Emma Carlen (Växa, NAV)

In cooperation with other breeding organizations and universities, the Council on Dairy Cattle Breeding (CDCB) US, has developed an index which focuses on reducing the feed cost for dairy production through breeding. In the US the index is called Feed Saved and was published for the first time in December 2020. It is expected to become part of the overall Net Merit index as from April 2021. Feed Saved is similar to the Nordic index for 'Saved Feed' estimated by NAV (Nordic cattle genetic evaluation) for dairy cattle populations in Denmark, Finland and Sweden, however, there are differences.

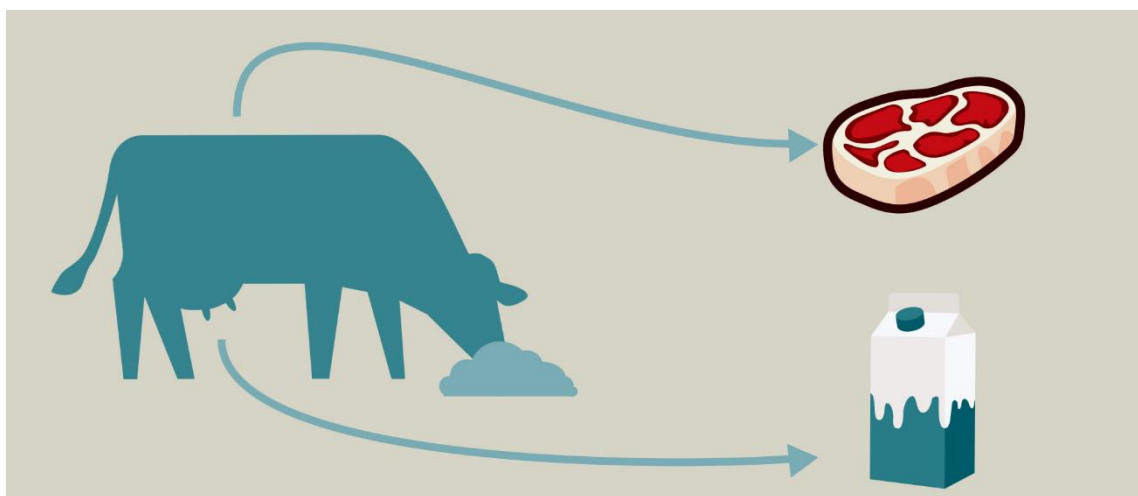
Why is it interesting to save feed?

Expenses for feed account for half the cost on dairy cattle farms. It is also important for society, that the agricultural sector will use the world's resources in the most efficient way. Furthermore, less feed used in production of milk and meat will reduce greenhouse gas emissions from both feed production and animal digestion.

Therefore, it is interesting for the farmer to breed for cows using less feed to produce the same output of milk and meat. We already do this in the Nordic countries and now it is possible in the US as well.

Description of US index

As in the NAV countries, the US index for Feed Saved consists of two components – maintenance and metabolic efficiency. In the breeding value estimation for maintenance the Americans use conformation classification as a measure for the cow's body weight. The basis for metabolic efficiency is feed intake data from 6,200 American Holstein cattle from research herds across the US. Metabolic efficiency is defined as the difference between the actual feed intake and the expected feed intake. The expected feed intake is calculated from the cow's requirement for milk production, maintenance and weight changes. The cows with high breeding values for metabolic efficiency, are the ones using less feed than expected.



Differences and similarities between the US and the NAV index

Basically, NAV countries and the US breed for less feed intake in a similar way. Both systems have two breeding values and are based on the same registrations, however there are also significant differences. In NAV countries we use both individual body weight measured with scale and classification of conformation traits in the breeding value estimation for maintenance. The goal is to reduce the body weight, however since weight is not available for all animals, classification data increases the reliability of the breeding values. The US only uses classification data, as scale measurements are not available. Hence the expectation is that the possibility to genetically reduce body weight will be higher in NAV countries compared to the US, due to higher reliability of breeding values for maintenance.

When it comes to metabolic efficiency, we use the same type of data and heritability. The main difference is that the US has only measured feed intake in part of the lactation on research farms and only after the most critical period for the cow – the beginning of the lactation. In NAV countries we use registrations from the entire lactation, in order to avoid the index being affected by only specific lactation periods. On the other hand, the US has a significantly higher number of cows with feed intake data – at the moment the US has around 6,200 against 2,400 Holstein cows in the NAV countries. However, there are fewer registrations of feed intake for each cow in the US. The number of cows included in Saved feed from NAV will increase gradually as more production herds get equipment installed that can measure daily feed intake on cow level (CFIT equipment from VikingGenetics). The US only calculates Feed Saved for Holstein and therefore, NAV countries are the only countries in the world to also estimate breeding values for red dairy cattle (RDC) and Jersey.

The effect of breeding value for Saved feed

The spread of the index for metabolic efficiency from NAV is relatively low today and most young bulls have an index in the range of 94-106. The future expectation for metabolic efficiency is that the variation among bulls will be higher, when more CFIT data are included. This will make it easier for you as a farmer to choose the best bulls for Saved feed and further reduce feed cost more when selecting based on NTM.

There is less kg saved dry matter in Feed Saved compared to Saved feed. This means that an increase of 1 index unit Saved feed from NAV will give nearly twice as much reduction in feed intake, compared to 1 index unit of Feed Saved from US.