NAV Nordisk Avlsværdi Vurdering
Nordic Cattle Genetic Evaluation

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About the base – fixed or rolling?

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Through breeding, future animals are genetically improved so that they are on average better than their parents. This means that the cows in your herd are constantly improving genetically, which benefits your economy. But how can the cows improve if the best AI bulls have the same NTM level in the different index rounds?

What is a base?

When calculating breeding indices, a base of animals is used to create the average. In the Nordic breeding system, the base for most traits consists of cows that are 3 to 5 years old and have phenotypic records for the given trait. For NTM, the average is 0, so the average NTM for the cows between 3 and 5 years old should be zero. For other traits in NTM, the average is 100, so cows with a yieldindex over 100 have a genetic production potential that is over the average of cows that are 3 to 5 years old. If you think about your own herd and the age of your cows, you will have many cows in this age group. In most herds, these are cows in their second and third lactation. As a result, the average in the Nordic breeding system primarily reflects cows that are actively milking within the herds.

Rolling base

In the Nordic countries, a rolling base is used. This means that for each index calculation, the base consists of cows that are between 3 and 5 years old. At the large breeding evaluation four times a year, new registrations from the last three months are included. At the same time, cows that have become five years old are removed from the base, while cows being three years old are added. In other words, the base rolls as it moves with each index round. Additionally, since the old animals leave the base and new, younger animals enter, the genetic level of the base increases. Therefore, the index level of the top bulls is roughly the same over time as both the base and the new bulls are genetically better. At the same time, this means that as animals get older, they drop in indices as the base they are compared to keeps getting better. Figures 1 and 2 show how the rolling base is moving over time.

Figure 1: NTM rolling base

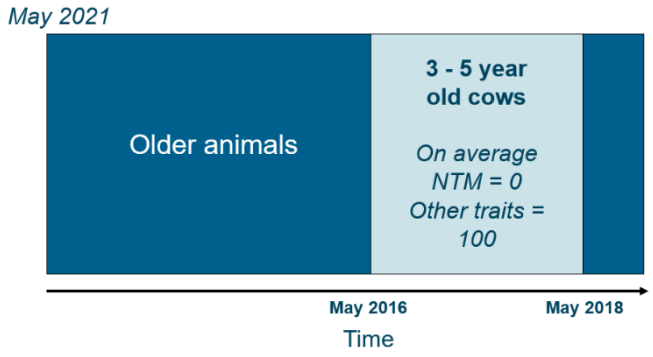
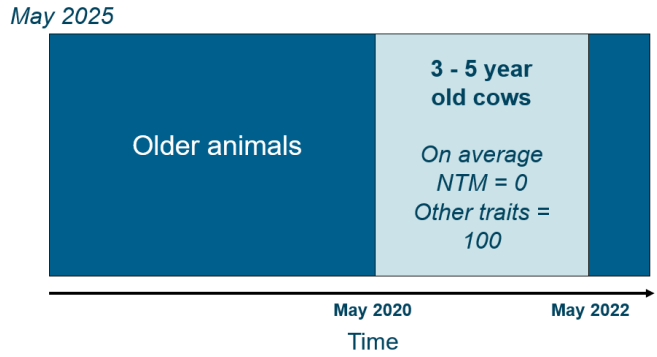


Figure 2: NTM rolling base



September 2025

Fixed base

A fixed base means that the reference animals in the base remain the same over a longer period of time. For example, the base could be cows born in 2020 and 2021. When the base is fixed, the average does not change between index rounds. As time passes and the newborn calves get genetically better, the indices for the youngest animals will continually increase. This means for example, that an index of 150 can be the best in one round and six months later the best index is 160. To prevent the indices from going completely off the scale, base adjustments are performed at certain intervals - like every five years. Figures 3 and 4 illustrate how the base is fixed and that a larger proportion of animals are younger than the base over time.

Figure 3: Fixed base

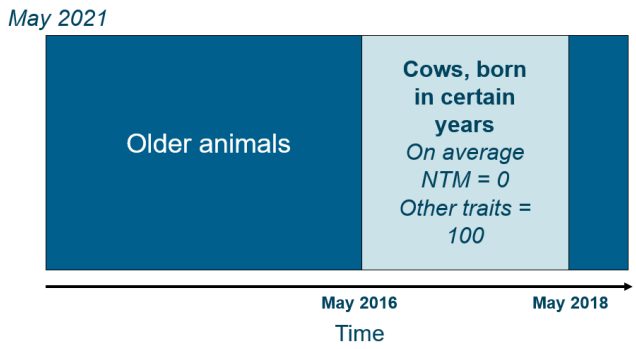
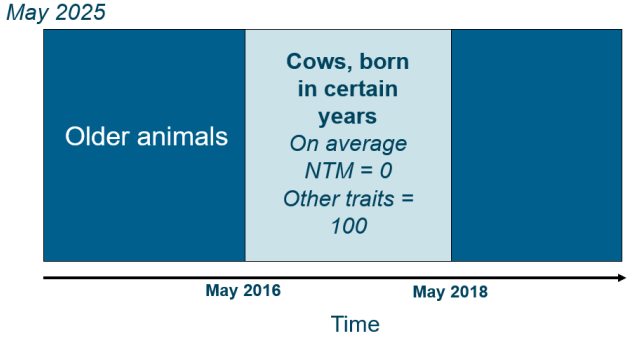


Figure 4: Fixed base



Pros and cons

There are pros and cons to both systems:

- **Rolling base**: The index level for the different animal groups is relatively similar over time, so you know when an index is good. On the other hand, the indices decrease over time for individual animals
- **Fixed base**: The indices for individual animals are fairly stable over time, except at base changes where all animals change at the same time. The index level of the best groups is constantly increasing, which can make it difficult to recognize what a good index is

Differences across countries

There are differences between countries in terms of their procedures, which can be divided into three groups:

- Rolling base at each index round
- Partly rolling and partly fixed base, with the index base changing every year
- Fixed base that is changing every five years

Did you know that….

The USA have a fixed base that is adjusted every five years. In the index calculation in April 2025, the base in the USA was adjusted. The large drops in the USA indices are therefore due to the base change.

September 2025

Due to different modeling calculations, each country may have slightly different bases for each trait. The comparison below is for the production traits:

- NAV-countries: Rolling base four times a year with cows that are 3 to 5 years old.
- Norway: Rolling base every 14 days with cows that are 3 - 8 years old.
- Germany: Rolling base three times a year with cows that are 4 to 6 years old.
- Canada: Rolling yearly base in April, with cows that are 6 to 8 years old.
- France: Rolling yearly base in February, with cows that are 6 to 8 years old.
- The Netherlands: Rolling yearly base, with cows that are born in 2020 for year 2025.
- USA: Five-year fixed base with latest change in April 2025.