

# Nordic Cattle Genetic Evaluation – a tool for practical breeding with red breeds

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The company Nordic Cattle Genetic Evaluation (NCGE) has the responsibility for development and routine genetic evaluation for dairy cattle in Denmark, Sweden and Finland. The estimated breeding values (EBVs) are based on the thoroughly registrations done by dairy farmers within the three countries. The final goal is to estimate EBVs for all traits in the breeding goal for dairy cattle.

NCGE was established January 1, 2002. The motivation for establishing the company was to:

- Get a more efficient use of resources for developing new EBVs and methods
- Do more reliable prediction of breeding values
- Improve cooperation in the practical breeding work in the North via common Nordic EBVs.

## Recording of traits

The three countries have very similar registration schemes for all important traits within dairy cattle breeding, including more than 20 years of systematic disease recording. All registrations are stored in central national databases and used for both management and breeding purposes. The nearly 100% similarity in recording schemes across the three countries, makes cooperation very effective. Current and future registration work will focus on further harmonisation of traits actual recorded and traits to be registered in the future. Two examples of ongoing harmonisation work are the joint Nordic workshops for classifiers taking place every second year, and the ongoing discussion about a joint Nordic registration scheme for hoof trimming data.

## Populations

In total, the numbers of milk recorded cows in the three countries are: 348,000 Red Dairy Cattle (RDC) cows (42,000 Red Danish, 141,000 SRB and 165,000 Finnish Ayrshire), 601,000 Holstein cows (372,000 Danish Holstein, 158,000 Swedish Holstein and 71,000 Finnish Holstein) and 60,000 Jersey cows. Approximately 270 RDC, 370 Holstein and 60 Jersey young bulls are tested per year.

## Genetic evaluation

NCGE's goal is to use the best possible statistical models for genetic evaluation in practice. Genetic evaluation takes place within 3 main breed groups: Holstein, RDC and Jerseys. Furthermore a few minor dairy breeds are included in the evaluation.

In 2005, NCGE published the first joint Nordic breeding values for fertility traits, type traits, milk ability and temperament, based on registrations from all three countries. In 2006, joint Nordic EBVs for yield traits and mastitis were published, and in 2007, NCGE expects to publish the first joint Nordic EBVs for calving traits. Presently, development projects are going on regarding resistance against other diseases than mastitis and a joint Nordic Total Merit Index. Each country runs national routine evaluation for traits not included in the NCGE evaluation yet. The national run stops, as soon as joint Nordic evaluation is developed for that specific trait. Today NCGE has 7 routine runs per year for yield and type traits and 4 for all other traits. From January 2008, NCGE will have 6 routine runs per year for all traits.

### **Publication of EBVs**

All breeding values for dairy cattle in the three countries are harmonized, concerning definition of genetic base and standard deviation. In practice it means:

- All breeding values are expressed on a rolling "cow base" – mean 100.
- All breeding values are expressed with a standard deviation of 10 for sires with a complete 1<sup>st</sup> batch of daughters.
- Sub breeding goals for yield, fertility, body, feet and legs, mammary system and mastitis resistance are the same in all countries.

The genetic base comprises cows of all three countries for all traits with a joint evaluation. It means all cows and bulls can directly be compared across borders for yield traits, fertility traits, mastitis, type traits, milkability and temperament.

### **Benefits from joint Nordic evaluation**

The dairy farmers benefit in form of more reliable breeding values. Besides the development and routine costs are shared between three countries, which is an advantage for three rather small countries like Denmark, Sweden and Finland. Furthermore, joint EBVs give the basis for cooperation on practical breeding work like the planned merger between the Danish and Swedish AI-centres from 1 January 2008. NGCE is always open to discuss positive cooperation with more countries in the future, which can be especially valuable for the RDC breeds with a limited testing capacity for young bulls.