

More accurate claw health breeding values

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The most important change when a new claw health genetic evaluation was introduced in NAV in November 2015 is that the reliability of claw health breeding values for especially cows is markedly improved. The main reason for this is that published cow breeding values are now based also on their own claw recordings and not only on pedigree information which was the case previously. This implies that cows can be included in the reference population which in turn improves the reliability of genomic breeding values for claw health for both cows and bulls.

Sweden, followed by the other Nordic countries, have been pioneers on registration and genetic evaluation of claw health, which today includes seven different claw disorders recorded in the first three lactations. Traditional phenotype-based breeding values (EBV) for the most important traits (dermatitis, heel horn erosion, sole hemorrhage and sole ulcer) was introduced in Sweden already in 2006 and jointly for all seven traits in NAV in 2011, whereas genomically enhanced breeding values (GEBV) was first published during 2014. The interest for breeding for claw health has spread across the world and today a few more countries collect registrations and have genetic evaluation for claw health traits.

NAV always strive to improve their evaluations and therefore a revised claw health evaluation was implemented in November 2015. The main change with the new evaluation is that published **cow breeding values (EBV, GEBV) now are based also on cow's own records** and the main effects of this change are:

- Improved reliability of EBV for cows
- Improved reliability of GEBV for cows and bulls

One ongoing process in NAV is to change evaluation for all trait groups to models where the breeding values for cows also include own performance (so called animal models). Although such a model was used already in the previous claw health evaluation, NAV chose to publish breeding values for cows based on pedigree information (in the case of EBV) and pedigree plus genomic information (in the case of GEBV) to gain some more experience. When the new evaluation is implemented cow breeding values includes cow's own information which increases reliability of cow EBVs. It also enables cows to be used in the reference population. The latter is crucial since it gives more accurate direct breeding values based on genomic tests (DGV). Thus, the reliability of resulting GEBV is increased by improved reliability in its two parts (EBV and GEBV).

The increased reliability in cow breeding values implies that we can now better predict the cows' true genetic potential for claw health resistance. As an effect, cow breeding values changes more than usual. The correlation between new and previous claw health index EBVs for cows is around 0.85 while the corresponding figure for bulls is around 0.95 (slightly lower for Jersey).

Other improvements in the evaluation are updated genetic parameters and a new method for reliability calculation. The latter implies that reliabilities for bulls drop slightly compared to previously. Also data quality and editing have been improved.