

## More improvements to Nordic female fertility evaluation

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*Genetic evaluation of female fertility (fertility) has gone through significant improvements. The first improvements were implemented already in May 2015 when the model was changed from a sire model to an animal model, genetic parameters were updated and few other significant changes were made. The latest changes were implemented in November 2016 evaluation.*

### Correction for sexed semen

The use of sexed semen has increased rapidly and it is widely known that sexed semen has slightly lower pregnancy overall rates than conventional semen. To account for this in genetic evaluation, the effect of semen type was included in the model. However, the effect of including sexed semen in the genetic evaluation for female fertility is very limited. Correction for semen type, which is a male fertility effect, improved the breeding values of those younger bulls that have a lot of daughters inseminated with sexed semen. The change is also important for cows because they will be an important part of the reference group used to calculate genomic EBV's in the future.

### Conception rate is a new trait

Countries belonging to EuroGenomics are harmonizing traditional evaluations to increase the benefit of using the common reference population for genomic evaluation. As a part of this work, non return rate at first insemination (NRR) was replaced with conception rate (CR) and NRR will no longer be published. Each service of a cow or a heifer is defined as an observation; at maximum 10 services per parity are included. This means that CR gives more accurate information about the success of each insemination compared to NRR. The breeding goal for female fertility is unchanged, which means that female fertility index still includes the same traits as before.

### Other improvements

Other improvements to female fertility evaluation are correction for total heterosis in Holstein and including Finnish and Swedish Jersey data. Previously only Danish Jersey cows were included in the fertility evaluation but now also Finnish and Swedish Jersey cows are used. The data quality has also been improved by including Finnish pregnancy test results and this has some effect on Finnish animals. The editing of Swedish heifer data has been updated and it slightly effects the genetic trend of heifer traits for Swedish animals.

### Limited effect on ranking

Despite of the many changes implemented in the fertility evaluation, the correlations between old fertility index and November 2016 fertility index are over 0.98 for proven bulls, and over 0.97 for cows. This means that changes are small and the majority of Holstein bulls (97 %) change less than 4 index units. For RDC and Jersey the observed changes are slightly larger because of a more intensive use of sexed semen in Jersey, and relative more RDC bulls having offspring in Finland (effect of improved data quality). For RDC and Jersey around 90 % of bulls change less than 4 index units. For cows the pattern is similar; changes for Holstein are smaller than for RDC or Jersey cows.