

Large focus on genomic breeding values around the world

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Development of genetic evaluation and selection based partly on genomic information is still the hottest topic within the field of cattle breeding worldwide. There is also a focus on development or improvement of breeding value estimation for new and existing traits. These are the impressions from the annual Interbull conference held in Cork, Ireland in May.

Calculation of breeding values including genomic information is implemented in many countries. At present there is a large focus around the world to improve the present methods. At the same time improvement of evaluation for ordinary genetic evaluation, especially for health traits, is also evolving.

Coming steps for genomic selection

Today genetic evaluations in almost all countries where genomic information is included are performed in two steps. In the second step so called genomically enhanced breeding values (GEBV) are produced by blending traditional breeding values, based on phenotypic records from daughters or pedigree with genomic breeding values, based only on DNA information. However, many countries are working on procedures to include information on yield, conformation and other registrations together with information from genomic tests in one step. This has many advantages; especially that the reliability will be increased because data are used in a more optimal way.

Internationally the Interbull Center plans to calculate and publish international GEBV for all bulls in spring 2013. Today only bulls with breeding values based on daughter records are compared internationally. In 2013 also young bulls without daughter records but with an official GEBV will be included in international evaluation.

Until now mostly young bull calves has been genomically tested. However in the future more females will be tested, as prices on genomic tests decrease. The perspective on herd level is to improve the possibility to select the really best females as parents of the next generation and thereby improve the genetic progress. On population level it will be beneficial to include genomically tested females in the reference group to increase reliabilities – especially for small breeds. On the conference, researchers from Australia presented experiences with genomic tests of females on larger scale. They also used genotypes from females in the reference group with good results. Other countries like Ireland and France are on the way of testing females on a large scale.

Health and other traits

Besides genomics also traditional genetic evaluation, as we know it before introduction of genomic selection, is developed. An improvement of the traditional genetic evaluation makes it possible to improve the reliability of genomic breeding values.

Especially using data of disease diagnosis has an increased interest around the world. France introduced a mastitis index based on disease diagnoses in fall 2011. In Canada and Great Britain research is also done to calculate breeding values based on farmers registrations of udder disease. The challenge is getting data of good quality in a large scale. In Canada, it is planned to have an official index for resistance to mastitis in early 2013.

Further, research and plans to publish improved indices were presented for fertility (Great Britain), calving (Germany) and yield (Ireland). Results for interesting new traits were shown for fatty acid composition of milk (Belgium) and calf survival in the rearing period (Holland). The Dutch index is similar to the research done in Denmark, and published in the latest number of Viking Magazine. Furthermore, Danish results for milking speed and udder conformation based on data from milk robots were presented.

ICAR and Interbull

ICAR is the international organization dealing with standards and guidelines for registration of animals and performance recording. For instance, ICAR sets up standards for milk recording devices and tests and approves brands of electronic ear tags. ICAR has members from all over the world

ICAR has subcommittees for recording devices, animal identification, milk analysis and Interbull. Interbull is the organization that performs genetic evaluation of sires of the dairy breeds across countries. Interbull center is resident in Uppsala in Sweden. Besides making international genetic evaluation for dairy breeds Interbull organizes a yearly meeting where researchers and industry people exchange news in the area of genetic evaluation.

The Nordic countries are members and active in the international cooperation in both ICAR and Interbull.