Selection for Disease Resistance

Gert Pedersen Aamand, Nordic Cattle Genetic Evaluation, Agro Food Park 15, 8200 Aarhus N, Denmark, *e-mail:* gap@vfl.dk *Homepage:* www.nordicebv.info

Abstract

Diseases reduce animal welfare and result in economic losses to the farmer in the form of extra veterinary treatments, labour, decreasing milk production, discarded milk and involuntary early culling. Mastitis is the disease causing most problems in dairy cattle production, but also resistance for feet & leg diseases, metabolic diseases and fertility diseases are important traits to improve.

For both management and breeding purposes, an accurate registration system is essential for the reduction of disease frequency. The Nordic countries have had registration systems running for decades, but within the last five years several non-Nordic countries have established registrations systems as well. Today several countries focus on the possibilities to register diseases.

Most disease traits are characterised by having a relatively low heritability. However, they have a very large genetic variation that enables genetic selection for fewer diseases. An increasing number of countries include diagnoses of clinical mastitis in their genetic evaluation of udder health. Furthermore, the Nordic countries also use diagnoses of other diseases in the genetic evaluation for resistance against other diseases. Recently, the Nordic countries and the Netherlands have started genetic evaluation for claw health based on claw trimmer data. Most countries also include indicator traits like SCS and udder conformation in their genetic evaluation.

Today, the value of including disease resistance in dairy cattle breeding goals is generally accepted. In general, disease resistance is unfavourably correlated to production traits. Breeding goals have significantly changed in many countries during the last years, e.g. functional traits including disease resistance have received more weight in the breeding goal compared to milk production traits. In a breeding plan without genomic selection the EBV reliabilities for milk production are significantly higher than the corresponding figures for disease resistance for the selected males and females. But in a breeding plan with genomic selection the discrepancy between the reliabilities for the two trait groups will be reduced leading to a relatively higher genetic progress for diseases resistance compared to milk production.