

Symposium: Genomics for Robust Cows: 8th June, 2007. Lelystad the Netherlands.

About sixty participants from 12 different countries attended the symposium. Participants with a scientific background as well as a practical and business background all participated. This symposium was about what we called inspirational genomics. Speakers from different disciplines that use molecular techniques to solve complex problems in life sciences are brought together in order to inspire work on robustness of dairy cows and beyond. There were speakers both with and without experience with dairy cows and this mixture provided a valuable contribution towards robust cows.

The morning program consisted of talks introducing concepts from genomics and robustness in cows. The first speaker, representing a farmers' viewpoint, was Jan van Weperen, one of the largest dairy farmers in the Netherlands. He gave an overview of developments in dairy farming and outlined future developments. With the increasing scale of farms cows that are easy to manage will become more and more important. One of the main problems in this respect is currently the reduced fertility in high producing dairy cows. The second speaker examined the cows' perspective. Nicholas Friggens a physiologist from Denmark described the physiological background of robust cows. Robustness is a complex interaction of different traits, the environment and time (for example the stage of lactation). A single trait such as milk production is not a good indicator for robustness, since it may come at the expense of other traits such as fertility. Genomics offer excellent opportunities to work on robustness. The third speaker, Mari Smits from the Animal Sciences Group (Wageningen UR) gave an overview of techniques and possibilities in genomics. These vary from finding molecular markers to be used in selection decisions to unravelling of function, regulation and expression of genes in interaction with the environment (such as management, feed and pathogens).

The topic of the afternoon the afternoon was "inspirational genomics": A number of examples from different areas of research where genomics is used to solve complex problems, which may lead to ideas for solutions in cattle breeding. Eckhard Wolf from München in Germany outlined new strategies to investigate fertility problems in cows. Hij uses, for example, genomics to investigate communication between mother and embryo in order to develop array based diagnostic tools. Monique van Wordragen of NSure BV (a spin-off of Wageningen UR) showed how her company developed diagnostic tools for an array of problems in plant breeding. One example was the detection of virus infection in roses. Michael Müller of Wageningen UR showed examples of genomic research used to tackle problems in feed related diseases in humans. **For example, in analogy to pharmacology, nutrients can be considered as signaling molecules recognized by specific cellular sensing mechanisms. Microarray analysis of genes regulated by peroxisome proliferator-activated receptors (PPARs) can serve as an example. About 1000-3000 genes are regulated by PPARs.** Liz Glass from the Roslin Institute was the last speaker. She outlines the role of genetics in the response to vaccination. It is clear that different genes are involved, both in humans and livestock, determining the success of vaccination. Identification of these genes may help to improve the response to vaccination.

The symposium did not give ready to use solutions for robustness in cows, but showed the enormous potential and the rich reservoir of solution available for attacking problems. This may be the initiation of the development of new and creative solutions in cattle breeding.