Selection for robustness and product quality in dairy cattle; an international effort

Berry, D.P.[1] and Veerkamp, R.F.[2], [1]Teagasc, Moorepark Dairy Research Center, Fermoy, Co. Cork, Ireland, [2]Animal Breeding and Genomics Centre, Wageningen UR Livestock Research, Lelystad, 6708WC, Netherlands; donagh.berry@teagasc.ie

The impact on profitability of reduced health, fertility and longevity in dairy cattle as a consequence of aggressive selection for milk production is unsustainable. Furthermore, there is a growing awareness among consumers of the increasing levels of animal wastage in modern day European dairy production systems as well as the quality of the milk produced. Exploration of the opportunities in animal breeding, to mediate against unfavourable trends in animal robustness and milk quality requires a concerted effort among international scientists, with expertise in different production systems. ROBUSTMILK is an EU Framework7 project (http://www.robustmilk.eu), bringing together geneticists from the Netherlands, the UK, Sweden, Belgium and Ireland with the objective of developing new practical tools to allow breeders to re-focus their selection to include milk quality and dairy cow robustness. Robustness is defined as (a) the ability of the animal to remain close to nutritional homeostasis, and (b) the ability of an animal to perform equally well in different environments. Milk quality relates to milk somatic cell count, fatty acid type and content and lactoferrin content. Phenotypic, statistical and genomic tools are proposed. Results to-date clearly demonstrate that mid-infrared spectroscopy analysis of milk can predict the major fatty acid component of milk across different breeds and production systems with a very high degree of accuracy. Prediction of energy balance from the mid-infrared spectrum is also possible. Large genetic variation has been identified in traits that better capture changes in somatic cell count and new statistical methods have been developed that can be used to select animals that have less residual variation and that avoid becoming sick but also recover more quickly if they become diseased. Genomic regions associated with milk production, somatic cell count and indicators of energy balance have been identified.

Ethical dilemmas in dairy farming

Stassen, E.N., wageningen university, animal sciences, marijkeweg 40, 6709 PG Wageningen, Netherlands; elsbeth.stassen@wur.nl

The introduction of loose housing systems and other developments in housing, feeding and treatment of dairy cattle have improved the efficacy of milk production resulting in less labour per cow and better working conditions for the farmer. At this moment, dairy farming is on the verge of major changes because liberal market principles will be introduced to the dairy sector. Despite an expected gradual increase in worldwide demand for milk, the costs of milk production will therefore become more important. As a consequence, the number of dairy farms will reduce in the coming ten years in combination with an increased number of dairy cattle per farm. In society there is concern that these developments will result in a growing objectification of the animals. Questions are raised about the longevity of dairy cattle and welfare problems such as claw disorders. It is of interest to understand the ethical dilemmas by giving consideration to the principles of wellbeing, autonomy and justice in relation to each stakeholder group: farmers, dairy cattle and citizens/ consumers. For that, different views on animal welfare including the relation to longevity and moral attitudes of people towards animals will be considered. These considerations will be further elaborated on the main cause of diminished welfare in dairy cattle, claw disorders. Despite considerable investment in research, technology and information transfer, no reduction in the prevalence of claw disorders and lameness has occurred. Insight into the key ethical dilemmas will help to bridge the gap between farmers and technical animal sciences on the one hand and society on the other hand.