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Milk Genomics -

Genetic influence on milk composition and technological properties in Swedish and Danish milk

This PhD project is a part of a Danish-Swedish Milk Genomic Initiative which is a collaboration between Lund University, Swedish University of Agricultural Sciences, the Swedish milk association, Viking Genetics and Aarhus University. The project is funded by the Danish Council for Strategic Research, Swedish Farmers' Foundation for Agricultural Research, the Danish Cattle Federation and Arla Foods. At the moment there are six PhD students working in the project where of five is at Faculty of Agricultural Sciences at Aarhus University and one at the division of Food Technology at Lund University.

Background

The composition of milk does not only affect the nutritional value but also the processability. It is well known that the variation in milk composition is caused by both environmental factors, the physiological condition of the cow and the genetic make up. To ensure a good quality of the milk the feeding has been regulated, which can affect the fat content and fat composition. It is also important to take the stage of lactation into account since this can affect the salt and protein composition. However, there are also differences in milk composition between different breeds and individual cows which are due to the genetic variation. There is now a lot of research in the area of milk genomics which refer to the study of the genes that control and affect the milk production of a mammal. Scientists are investigating how the genes of a mammal affect the composition and yield of the milk which is important information in, for example, the area of breeding of milk cows. If we understand the impact of the cow's genome on the milk composition we can use the information to breed cows giving the best milk.

Hypothesis

The hypothesis is that by identifying and evaluating the genes in the cow's genome, which affects the content of different components of milk in relation to the technological characteristics, it will be possible to govern the processing quality of milk by conventional breeding.

Aims of the research

The aims of the research are to investigate the impact of genetic polymorphism on enzymatic coagulation properties, the micro structure of milk from individual cows from different dairy breeds and to look at the expression of individual caseins and whey proteins in milk from dairy cows with different genetic protein variants and of different breeds. The long-term goal is to identify genetic markers that can give the possibility to breed cows that will give a milk product with wanted characteristics.

