

Report SABRE placement fund Ina Hulsegge

From 4 - 16 January and 15 - 26 February, I visited University of Aarhus Faculty of Agricultural Sciences (formerly Danish Institute of Agricultural Sciences (DIAS)) Denmark. In those four weeks, I worked together with P. Sørensen and Li Jiang.

Introduction

Fertility is an important trait in dairy cattle. Within SABRE, Work package 6 (Fertility), a number of aspects of fertility are being studied. Oestrous behaviour is important for signalling the proper time point for artificial insemination, but little is known about genetic regulation of oestrus and oestrous behaviour. We have studied expression levels of genes in five brain areas of heifers at day 0 (oestrus) or Day12 (luteal phase), using microarrays. Data analysis is being performed using a number of methods.

The purpose of the present collaboration in the SABRE placement award is to explore further possibilities to analyze the data and extract biological understanding from the available data, by collaboration and personnel exchange between the partners ASG and AU.

In addition to current ongoing analysis of the microarray data related to oestrous (behaviour), we used a system biology approach, developed by AU (SABRE, Work Package 1), in order to gain biological insights and extract biologically meaningful results from these data. The approach ranks important genes in livestock species, using microarray data, protein-protein interaction and text mining. In our analysis the approach was used to identify and rank genes related to reproduction in cattle. The approach consists of the following steps:

1. Identify candidate gene complexes
2. Determine transcriptome profile of candidate complexes.
3. Determine phenome profile of candidate complexes
4. Rank the candidate genes based on a combined Z-score

The analyses of the available microarray data are almost completed. Now we are working on interpretation of the results to get insights into the genetic regulation of oestrus (behaviour) and fertility in cattle. It is intended to report the results in a paper.

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