Project description – PAT on Götene Alexander

Today Götene Dairy is one of the leading dairies for producing yellow cheeses. It produces 18,000 tons per year and has one of the largest distributing and packaging process which distribute and pack 125.000 tons per year. The products are sold all over the world. The dairy produces block cheese but in addition big wheel and cylinder cheese are processed in the packaging area. There the cheese is cut, sliced and shred.

The aim of this study is to give input to an internal specification for the cheese from the dairy to the packaging, with the goal to optimize the packaging process. This will be a part of a holistic view of product optimization through the whole process.

This will be done by multivariate data analysis on data from:

a) In-line real time data collection

Data from the packaging/maturation area:

Maturation period:

Time in each temp zone

Placement on pallets and turning of the pallets

Slicing: Weight (10 kg block, file, cutoff, finished product

Form (height, length, with)

Data from the dairy ( for relevant batches). Water content, Weight and process data (optional)

b) Data from sensory and chemical analysis from the existing process control routines

c) At-line analysis with H-NIR for a one or two series of cheese blocks

Model cheese: Wästgötakloster Svart 31 (WKS 31%)

Model line is a super slicer

Data period: ca 3 months, with ca 10-15 batches each month

Analysis of series of 50-150 blocks of cheese with at-line hyper spectral near infrared push-broom instrument. The instrument is calibrated for protein, fat, water content, salt, lactose, lactate and pH.

The analysis is done at-line in the packaging area on cheese that is going in to the slicing line and the speed of the analysis is about 5 cheese/min.
Responses:

Optimized against:

Yield of the cheese coming in to the packaging (cut off, give of weight etc)

Productivity (stop in the line cause by “default” in the cheese)

Competences:

The student should know how to use chemometric tools, basic statistics and spectroscopy.

The student should also be willing to spend some of the time in Götene in order to understand the process, get some practical knowledge and report the work to the personnel at the dairy during the project time.

Arla will of cause pay for all the expenses due to travelling, hotel and food.