DSK 2020

What is Quality and how do I Manage it?

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Quality Manager Mammen Mejerierne A/S

Background Mammen Mejerierne A/S

- Mammen Mejerierne A/S is a Danish family owned dairy company that started in 1953 in the village Mammen close to Bjerringbro. The company has now expanded and has cheese productions in Mammen (yellow cheese), Drøsbro (white and blue cheese), Onsild (white cheese) and Søvind (fresh cheese and specialties). Mammen Mejerierne A/S is owned and headed by CEO Lars Staunsbæk and his son Peter Staunsbæk.

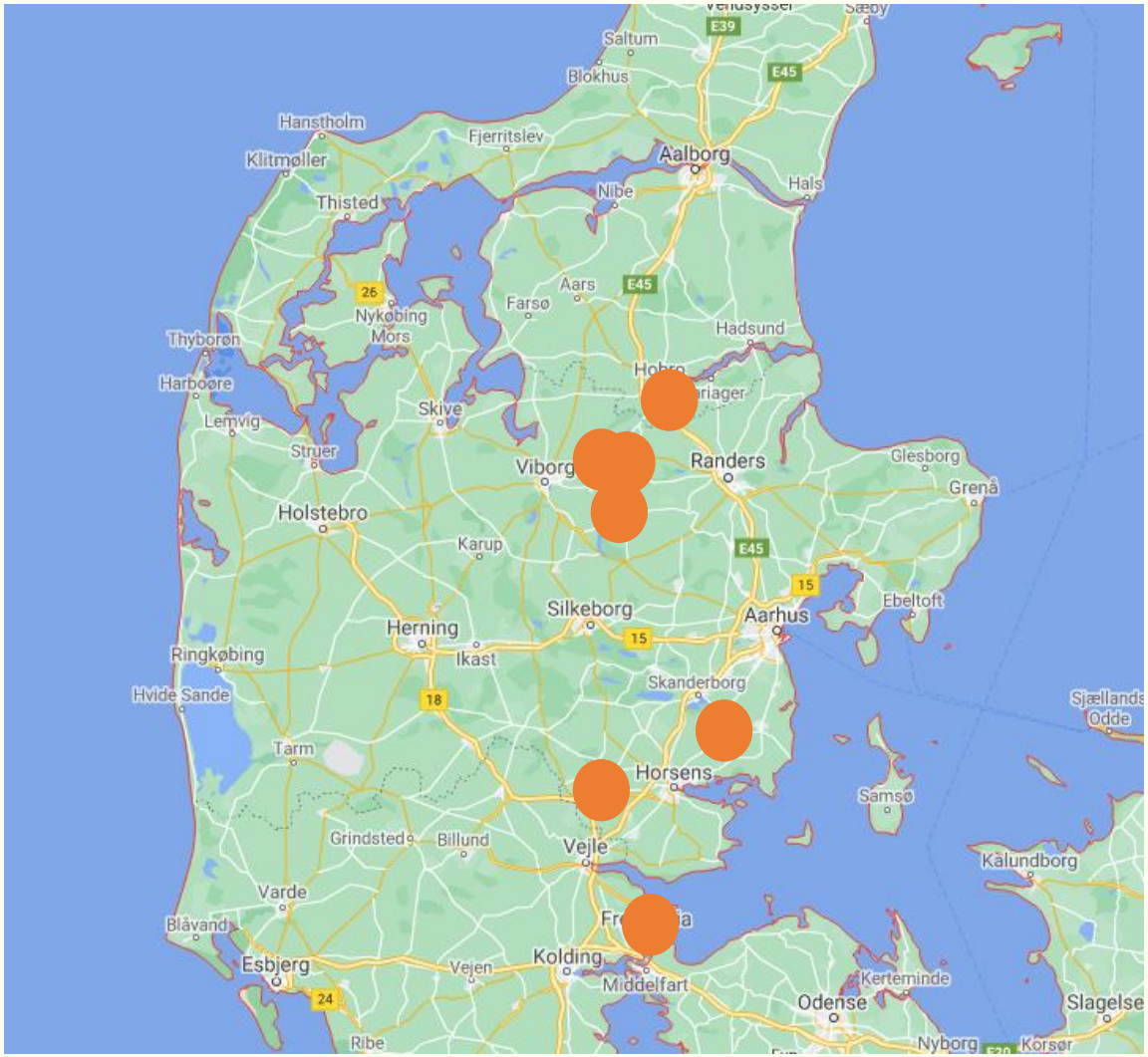
- We collect milk from 91 different farms in middle and northern Jutland as part of an agreement. In total 190 million kg milk per year is collected.
    - Hereof 1.5 million kg is organic milk

- Our world is cheese
    - We produce yearly 40.000 tons white, yellow, blue and fresh cheese for export and the Danish market
    - The Danish market consists of nationwide supermarket chains, cheese shops and food service/catering
    - Export goes to wholesalers and retail customers in app. 55 countries worldwide

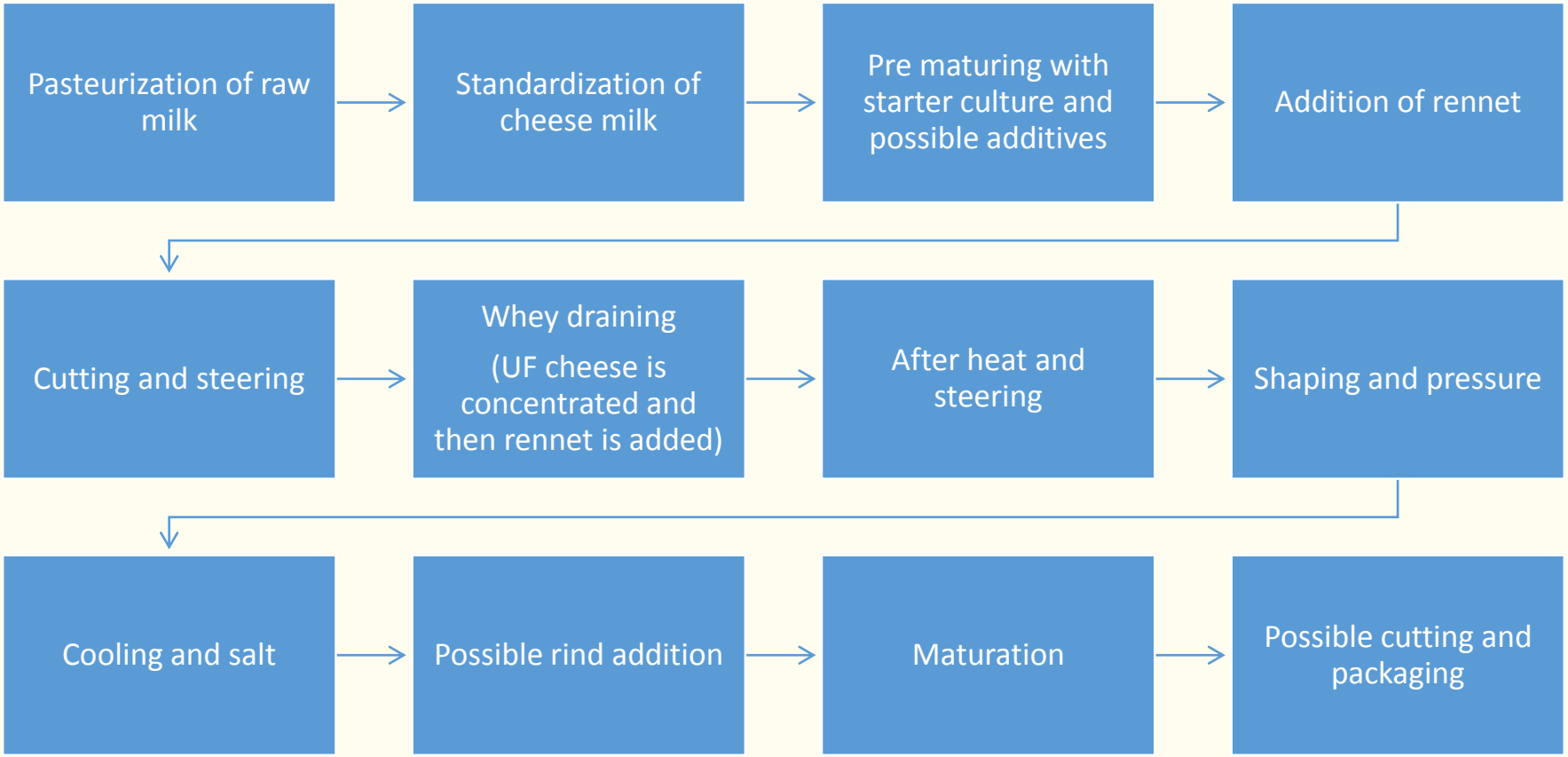
- We strive to obtain high quality product in a sustainable manner
    - Our milk is transported the shortest possible distance between farms and dairies
    - The farms located close to the dairies, in beautiful Central Jutland, is the main reason for the high quality

We have app. 200 employees in Mammen Mejerierne A/S divided between the 4 dairies; Mammen, Onsild, Drøsbro and Søvind, and furthermore there is Taul Cheese storage, Klovborg Cheese packaging and an export subsidiary in Fredericia.

Where to find us:



Quick description of how to make cheese



What defines Quality

Microbiological	Chemical composition	Sensory
Food safety	Legislation	Consumer

Quality Managements role:
Ensure a Quality Management System

Ensure quality of the products lies with all employees

The product only gets the wanted quality if employees tell when something is wrong (food safety culture)

Data collection/analysis at Mammen Dairies

Microbiology:

Analysis for Coli, E-Coli, Listeria, Salmonella, Mold and Yeast & Staphylococcus Aureus

Chemical composition:

Analysis for Fat, Dry Matter, Salt, Protein, FID

Sensory:

Evaluation for build, appearance, color and flavor

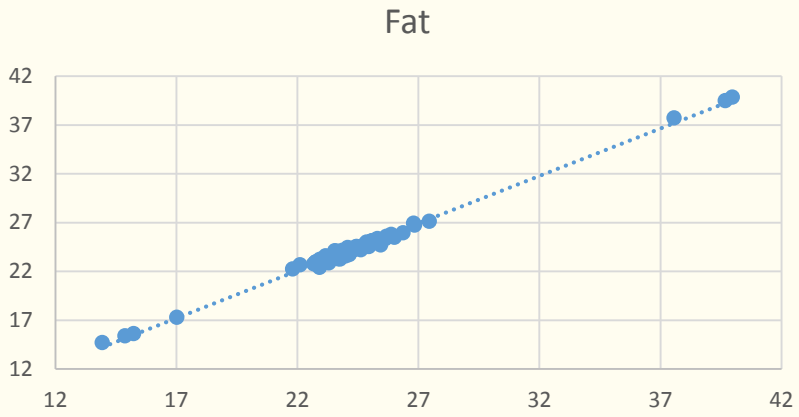
IR and NIR at Mammen Dairies

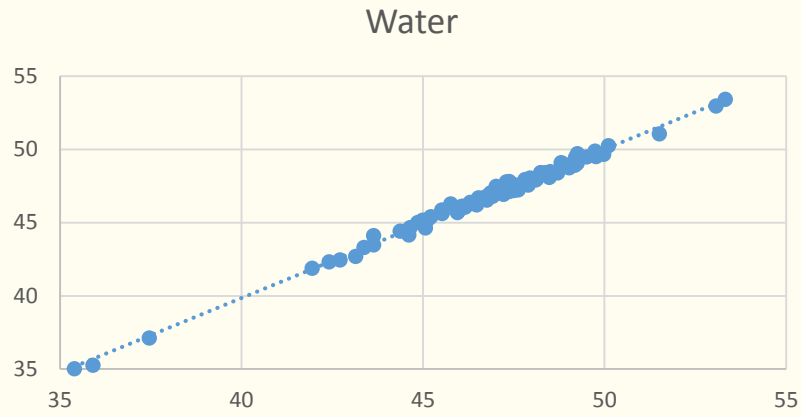
IR:
All 3 dairies have a Milkoscan
The Milkoscan results are used for the raw milk, standardization of the cheese milk and for whey
It is calibrated every 2 weeks and is very rarely adjusted

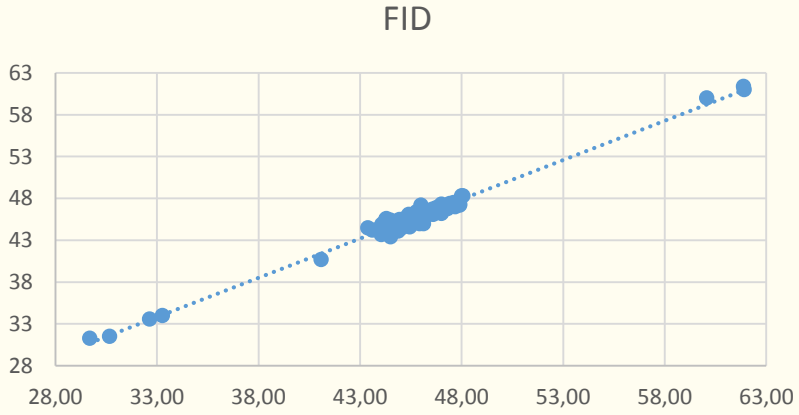
More IR:
Raw milk samples collected at the farms are send to Eurofins for analysis
These are analyzed for: anaerobic spores, cell number, fat (MS), freezing point (MS), lactose (MS), protein (MS), starter culture inhibitors, total aerobe microorganism, Urea (MS) & Residues of veterinary medicinal products

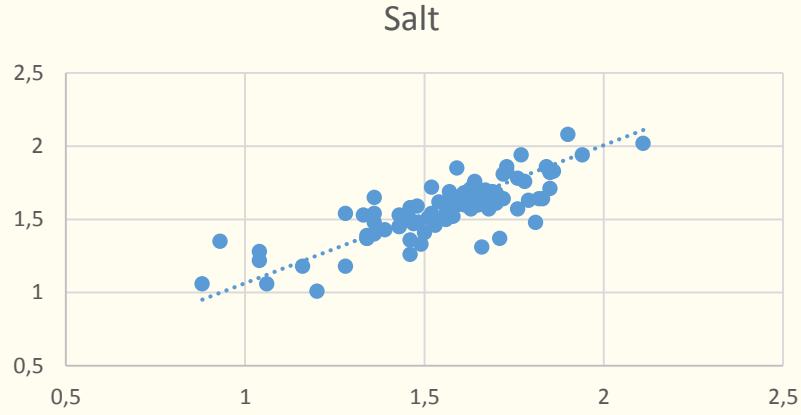
NIR:
There is one Foodscan at Mammen used by 2 dairies
The 3rd sends all samples to Eurofins

A little bit of data/results - yellow



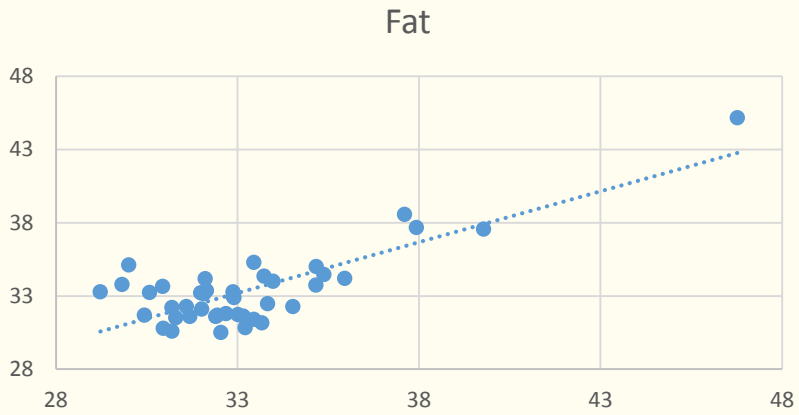


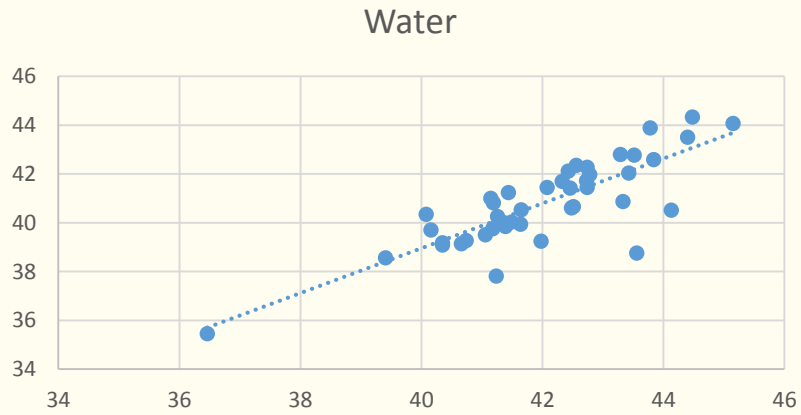


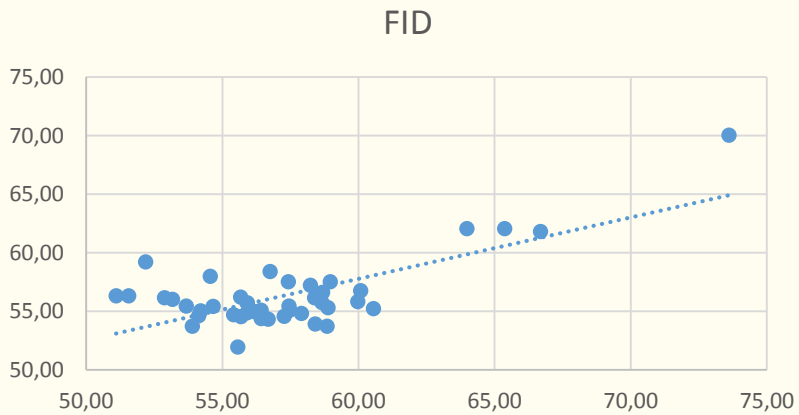


n=88 (1 year)	Fat	Water	Salt	FID
SEP	0,27	0,24	0,23	0,57

A little bit of data/results - blue





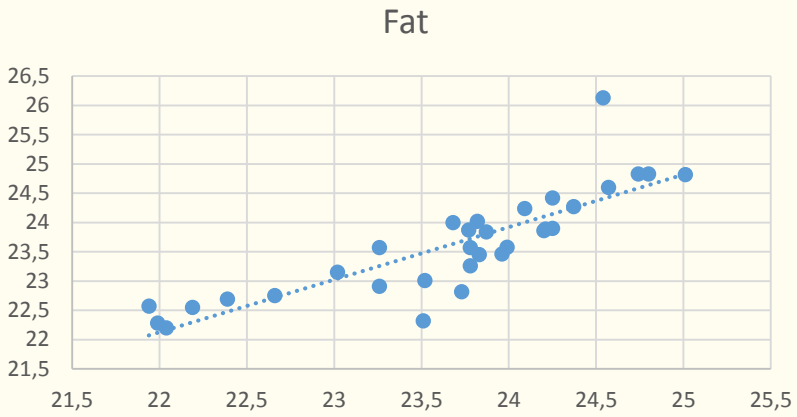


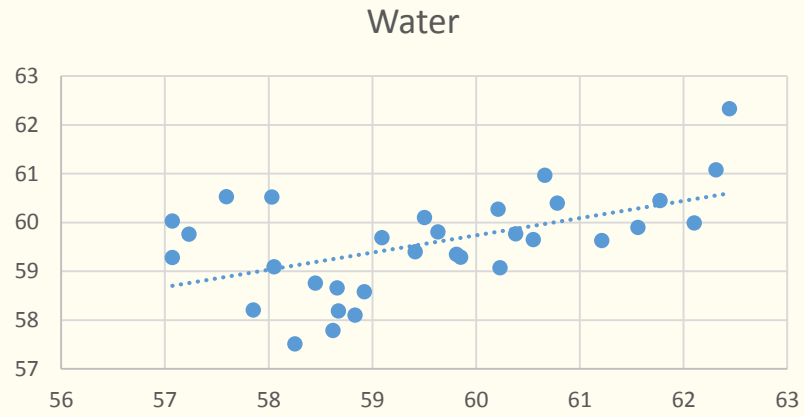
n=59 (1 year)	Fat	Water	Salt	FID
SEP	1,84	0,93	na	3,01

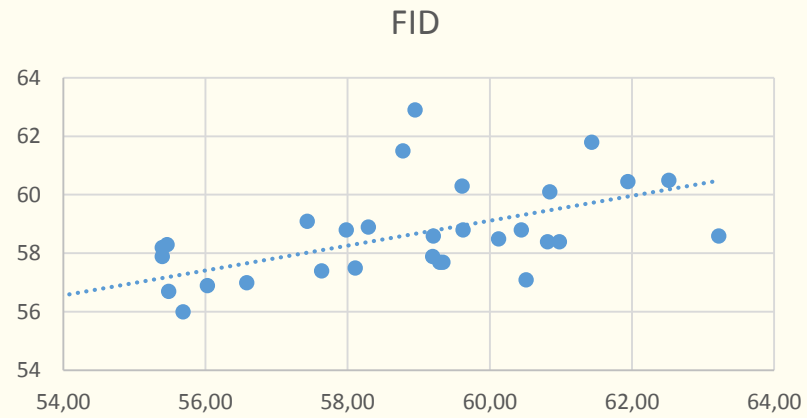
A little bit of data/results – blue

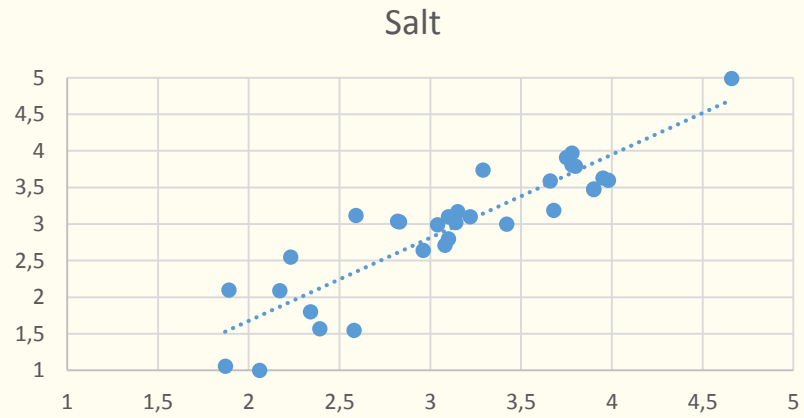
repeatability - normal mould				
n=14 (15 min)	Fat	Water	Salt	FID
Std dev	0,09	0,27	0,15	0,24
repeatability - higher mould				
n=22 (18 min)	Fat	Water	Salt	FID
Std dev	0,13	0,15	0,06	0,17
reproducibility - normal mould				
n=7	Fat	Water	Salt	FID
Std dev	0,19	0,36	0,49	0,63
reproducibility - higher mould				
n=7	Fat	Water	Salt	FID
Std dev	0,51	0,29	0,09	0,73

A little bit of data/results – white









n=37 (1 year)	Fat	Water	Salt	FID
SEP	0,47	1,38	0,42	1,95

A little bit of data/results – white

repeatability – first try				
n=14 (10 min)	Fat	Water	Salt	FID
Std dev	0,36	0,51	0,16	0,79
repeatability - second try				
n=18 (15 min)	Fat	Water	Salt	FID
Std dev	0,06	0,23	0,08	0,43
reproducibility				
n=7	Fat	Water	Salt	FID
Std dev	0,34	0,91	0,23	0,65

Sum up

Coming from a position where data analysis was the most important thing to a new position where I app. have worked 3 days in the last 18 months with data analysis, makes me think how can data analysis create value and what is important for the food industry?

VALUE FOR MONEY

- How do we use the results
- What does the results mean for overall quality
- Do we trust the results and do we need to trust the results

Sum up part 2

How could IR/NIR create bigger value in our production in the future?

- more information in the milk of value?
- curd/cutting time?
- protein in the finished product?
- analysis of composition in new products?
- optimization in the cheese production of the fresh cheese?

MAMMEN MEJERIERNE A|S