Future conditions for cattle production – which cow do we need?

- Value added Milk

Mikka Stenholdt Hansen
Research Scientist, ArlaFoods amba R&D

Our vision

Creating the future of dairy to bring health and inspiration to the world, naturally


To secure the highest value for our farmers' milk while creating opportunities for their growth
William Bunting
Ashbourne, United Kingdom
Arla

About Arla


12,600+ OWNERS
14+ BL. KG. MILK INTAKE
THE 4TH LARGEST
19,000+ COLLEAGUES
Arla
LURPAK
CASTELLO
3 BRANDS
10+ BL. EURO REVENUE


Arla

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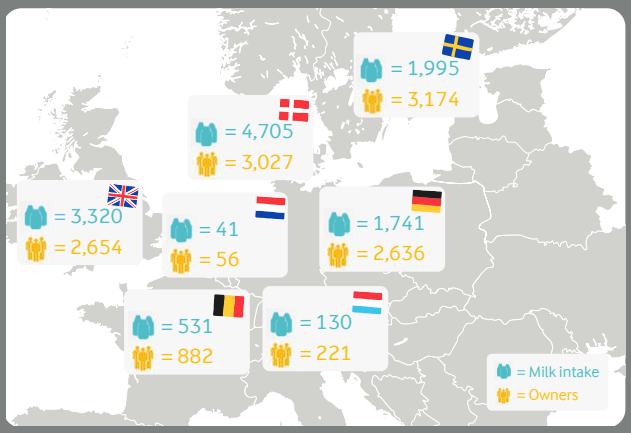
Arla has owners in **seven countries** - in 2015 they produced 14+ bl. kg. milk



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3.5 glasses for everyone

To the moon

x 7

Around the world

x 47

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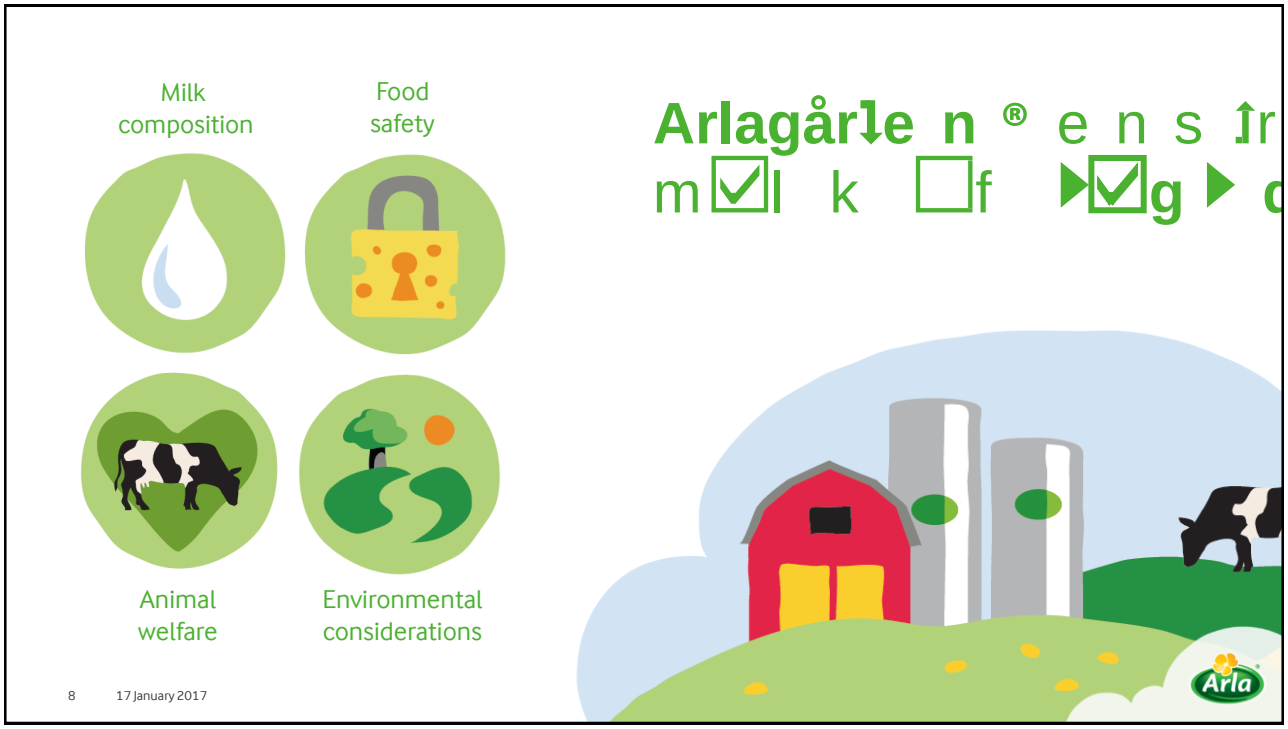
High Consumer demands
Are the cows treated well?
Explore dairy in new ways
Looking for natural healthier choices
Is the product safe to consume?
Arla


Milk composition
Food safety
Animal welfare
Environmental considerations
Arla
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Milk composition

- A natural composition of
  - fat,
  - protein,
  - minerals
  - and other important constituents
- A good, fresh taste.

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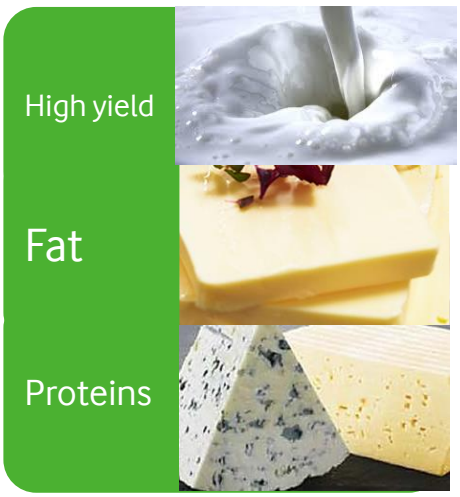
Milk ”breeding”

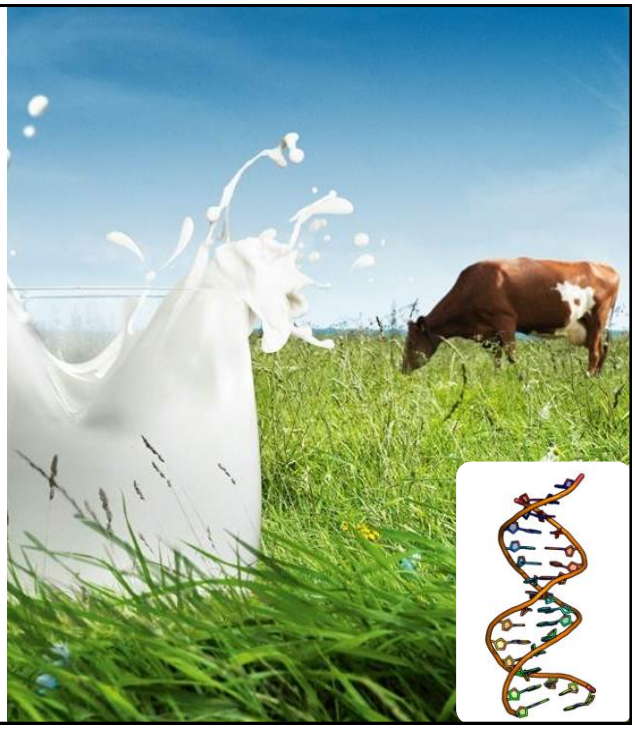
Today the “**milk breeding**” is primarily driven by factors related the **robustness of the cow** and yield, i.e. milk **yield** and content of **fat** and **protein**. Apart from measuring antibiotics, **microbiological quality** etc. aspects of technological quality are not taken into account.



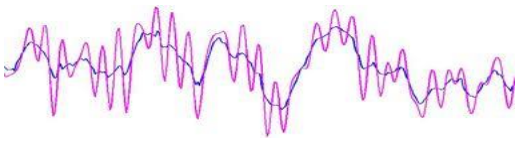
Milk genomics
Breeding for value added milk

Milk optimized for the technological use

e.g.
Optimizing Milk for cheese production and valuable Ingredients
- Without compromising the milk for other uses

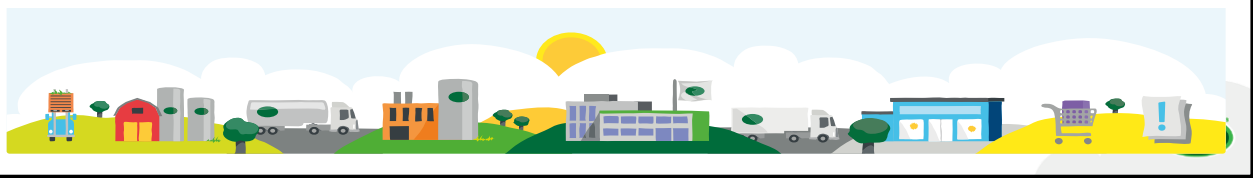


Cheese production



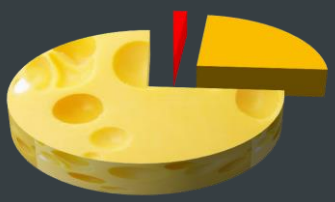
- In Denmark there are produced >300,000 tonnes of cheese per year
- If we through breeding can improve the milk for cheese production properties it will

minimizing variation during cheese processing (**BC: > 4 million Euro / year**)



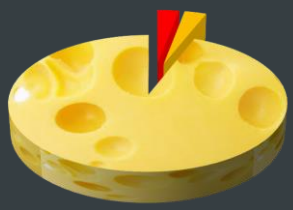
Milk coagulation properties

Danish Holstein-Friesian (SDM)



75% of the Danish dairy cattle's

Danish Jersey cows (JER)



12% of the Danish dairy cattle's

Swesish Red (SR)

41% of the Swedish dairy cattle's

Non coagulating milk | Poor coagulating milk | Good coagulating milk

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Sources: Doctoral thesis, Frida Gustavsson, Exploring coagulation properties in bovine milk using milk genomics approaches, (2014). P.D. Frederiksen, M. Hammershøj, M. Bakman, P.N. Andersen, J.B. Andersen, K.B.Qvist, L.B. Larsen, Variations in coagulation properties of cheese milk from three Danish dairy breeds as determined by a new free oscillation rheometry-based method, Dairy Sci. & Technol. (2011) 91 : 309-321. Landbrug & Fødevare . Växa, Sverige.

Coagulation properties reduced proportionally - when you mix good and bad coagulating the milk

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Kilde: Lotte Bach Larsen, AU

Breeding high value milk - Big Milk

Control protein composition and increase the content of high value proteins in bovine milk through breeding

High value proteins for ingredients
BC: > 13 million Euro / year

α-lactalbumin | Osteopontin | β-casein | NPC-2 | Transcobalamin

Food safety

We strive to offer our consumers safe and reliable milk-based products.

- The milk must contain no undesired substances.
- We must practice good hygiene, to avoid the risk of contamination.

Increase levels of antibacterial substrates in milk

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Animal welfare

We strive to ensure that animals' overall physiological and behavioral needs are met, so that their health and welfare is promoted. The animals must:

- Be healthy.
- Be kept and looked after in a sound environment.

Environmental considerations

We strive for production on the farm to be environment-friendly, with respect for nature. The farm must:

- Protect the surrounding environment and cultural landscape.
- Optimise the use of nutrients and work to reduce the use of chemicals.

CO2 reduced cow

Adding value to the entire milk pool

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Which cow do we need ?

- Healthy and robust
- Sustainable cow
  - Converting feed to milk
- Value added milk

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Milk Genomics
The Arla Dream Milk

Potential value to Arla:

Cheese
Optimal rennet coagulation

> 4 million Euro / year

Increase level of oligosaccharides

The Arla Dream Milk

Potential value to Arla:

Ingredients
Increase level of high value proteins

Osteopontin
Transcobalamin
α-lactalbumin
β-casein
NPC-2

> 13 million Euro / year

Increase mineral content (Ca, Fe, Zn)

Increase level of D-vitamin

CO2 reduced cow

Yoghurt
Optimal acids coagulation

Increase levels of antibacterial substrates in milk

GREEN = Running **YELLOW** = Ideas

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