KNOWLEDGE CENTRE FOR AGRICULTURE
Cattle

Use of data from electronic milking meters and perspective in use of other objective measures

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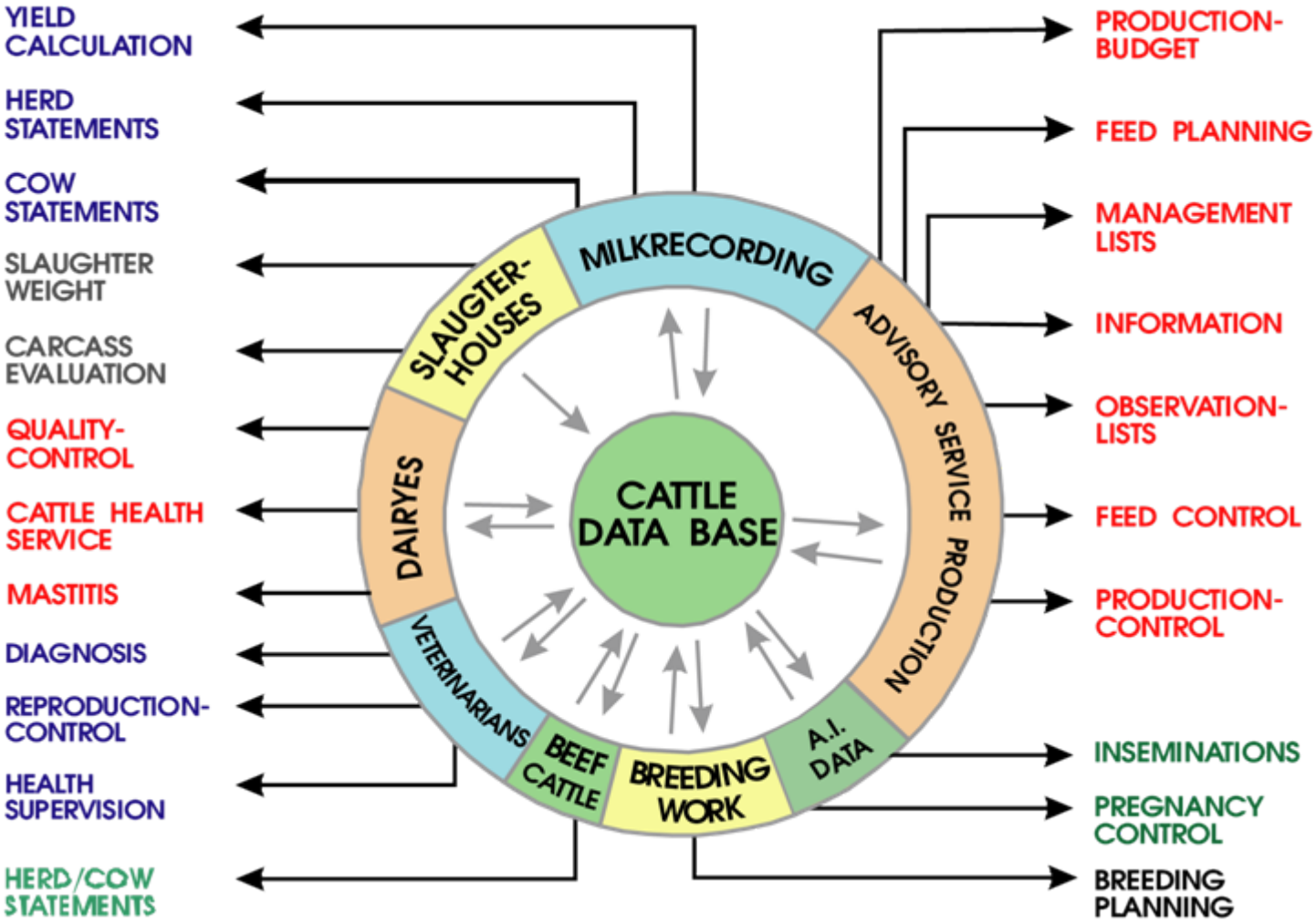
DANISH CATTLE DATABASE - THE CONNECTING ELEMENT

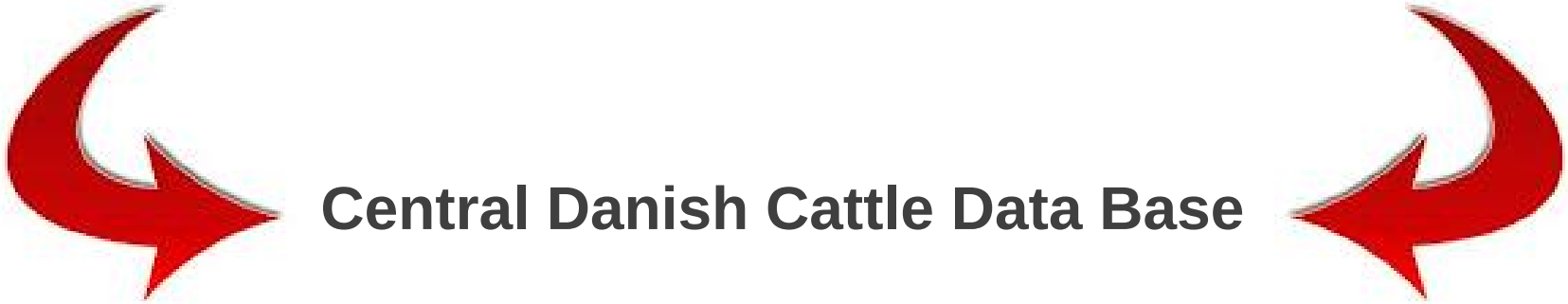


Data flow in the Central Danish Cattle database

Traditional data related to
- **Pedigree**
- **Milk production**
- **Health**
- **Calving**
- **Beef**
- **Conformation**

New data sources
- **TruTest electronic milk meters**
- **Lely and other robots**
- **Heatime**

Data on old and new traits



TruTest electronic milk meters

- 60-70 % of all cows in milk recording
- Milking; duration and volume
- Collected 6/11 times a year on farm

Lely robots

- 10-15 % of all cows
- Data collected routinely since Nov. 2011
- Collection done by milk recording technician
- Collected 6/11 times a year

DeLaval robots or others

- No collection of data yet
- Work done to collect data from DeLaval
- Same variables as for Lely

Heatime system

- Stand alone systems
- More than 1,000 systems in Denmark today
- Supplementary to data from Lely robots

New version of Heatime system might make it possible to collect data through Milkline in Italy

Procedure not determined yet

Management opportunities to exploite

Farmers with AMS

Add extra value in combination!

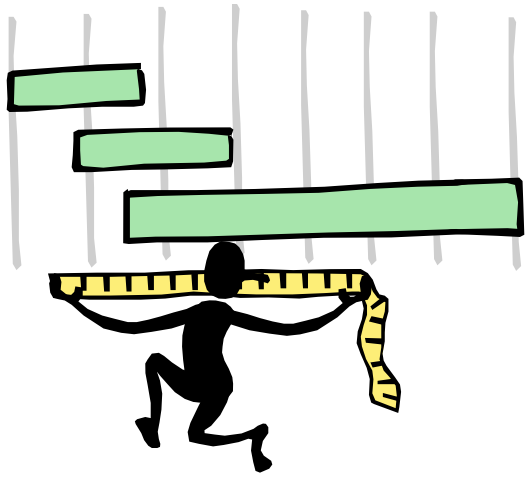
Breeding opportunities to exploite

All farmers

More genetic progress in combination**!**

Advantages of data from electronic equipment

- Registration of data exposing new traits and registrations complementary to existing registrations
- Repeated measurements
- Objective measurements
- Measured on all cows in milk
- Measured over more lactations



Examples of use

Implemented, analysed or future project

Breeding value

- Milking speed - Implemented and analysed
- Conformation - Analysed
- Health traits - Future project
- Feed efficiency - Future project

Management

- Optimal time for insemination - Future project

Milking speed

EBVs for milking speed based on:

- Assessed by dairy farmers (DK, S, F)
- Registrations by milk meters (DK)

Data from milking robots are not yet included in the genetic evaluation

Milking speed - traits

Farmer assessment - scale from 1-9

- 1st lactation - milking speed compared to other cows

Milk meters - fat and protein flow

- Milk yield per test day
- Fat and protein content from milk recording

Lely robot - fat and protein flow

- Moving average per test day
- Fat and protein content from milk recording

Genetic parameters for flow

Heritabilities and genetic correlations (S.E.)

	h^2	Rg - Assessments	Rg - Flow, milk meters
Flow, robots[1]	0.63 (0.07)	0.91 (0.05)	0.94 (0.03)
Assessments	0.20 (0.02)	-	0.91 (0.02)
Flow, milk meters[2]	0.41 (0.01)	-	-

[1]Based on 4,000 1st parity Holstein cows – 1,000 with assessment. Only 1st milk recording after calving.

[2] Based 272,000 1st parity Holstein cows – 5,000 with assessment. Only 1st milk recording after calving.

Udder conformation

Udder conformation is already evaluated

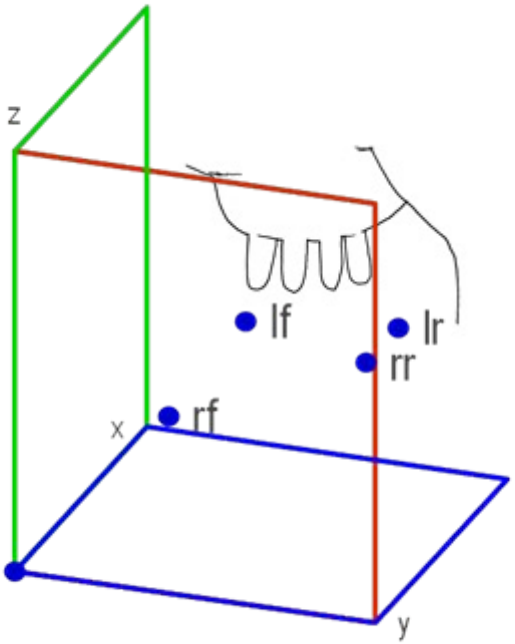
- Classified by experienced classifiers

130,000 Danish cows are classified per year

- The majority of the cows are 1st parity cows

Possibility to apply information on teat co-ordinates in the genetic evaluation

Udder conformation by teat co-ordinates



- Front teat placement
- Rear teat placement
- Distance, front - rear
- Udder balance
- Udder depth, tip of the teat - measuring point

Heritabilities for udder conformation traits measured in robots or classified

Trait	h^2 – Co-ordinates[1]	h^2 – Class.[2]	Rg
Front teat placement	0.46 (0.06)	0.31	0.92
Rear teat placement	0.38 (0.05)	0.32	0.94
Distance, front - rear	0.46 (0.09)	-	-
Udder balance	0.44 (0.07)	0.22	0.90
Udder depth	0.65 (0.06)	0.42	0.94

[1]Based on co-ordinates from 2,500 1st parity Holstein cows.

[2]Based on classification of 103,000 1st parity Holstein cows. 1,500 with both co-ordinates and classification

Health traits
Udder health and metabolic diseases

Today: veterinarian diagnoses

Future:
- Milk yield per quarter
- Weigh change
- Rumen activity
- Conductivity

By combining registrations - expectation of better measure of health status of cow

Feed efficiency

Registration of feed efficiency

- Expensive
- Small scale
- Not feasible way to get genetic improvement

Indicators of feed efficiency

- Some potentially interesting registrations – body weight, rumen activity
- Knowledge is needed!

Optimal time for insemination

Idea

Combine all available registrations to improve rate of pregnancy when inseminating at a certain heat

- Daily milk production
- Veterinarian diagnoses
- Relative weight loss
- Others

Only inseminate when chance is acceptable

Conclusion

- Registrations are collected from Milk meters and Lely robots
- More new data sources will follow
- Exploit opportunities in new data in management and breeding
- Status on present use; Implemented, analysed or future project

Conclusion - Flow

- **h^2 for flow and assessment are high**
- **High genetic correlations between the traits**
- **Possible to use flow from robots in EBVs**
  - Limited effect for bulls - already many obs
  - Effect for cows - AMS herds

Plan to include data from Lely robots in genetic evaluation for milking speed

Conclusion – Udder conformation

- **Higher heritabilities than classification**
- **High genetic correlations between measurements and classification (> 0.9)**

Plan to including teat co-ordinates from robots in the genetic evaluation

Thank you for attention

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