KNOWLEDGE CENTRE FOR AGRICULTURE
Cattle

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


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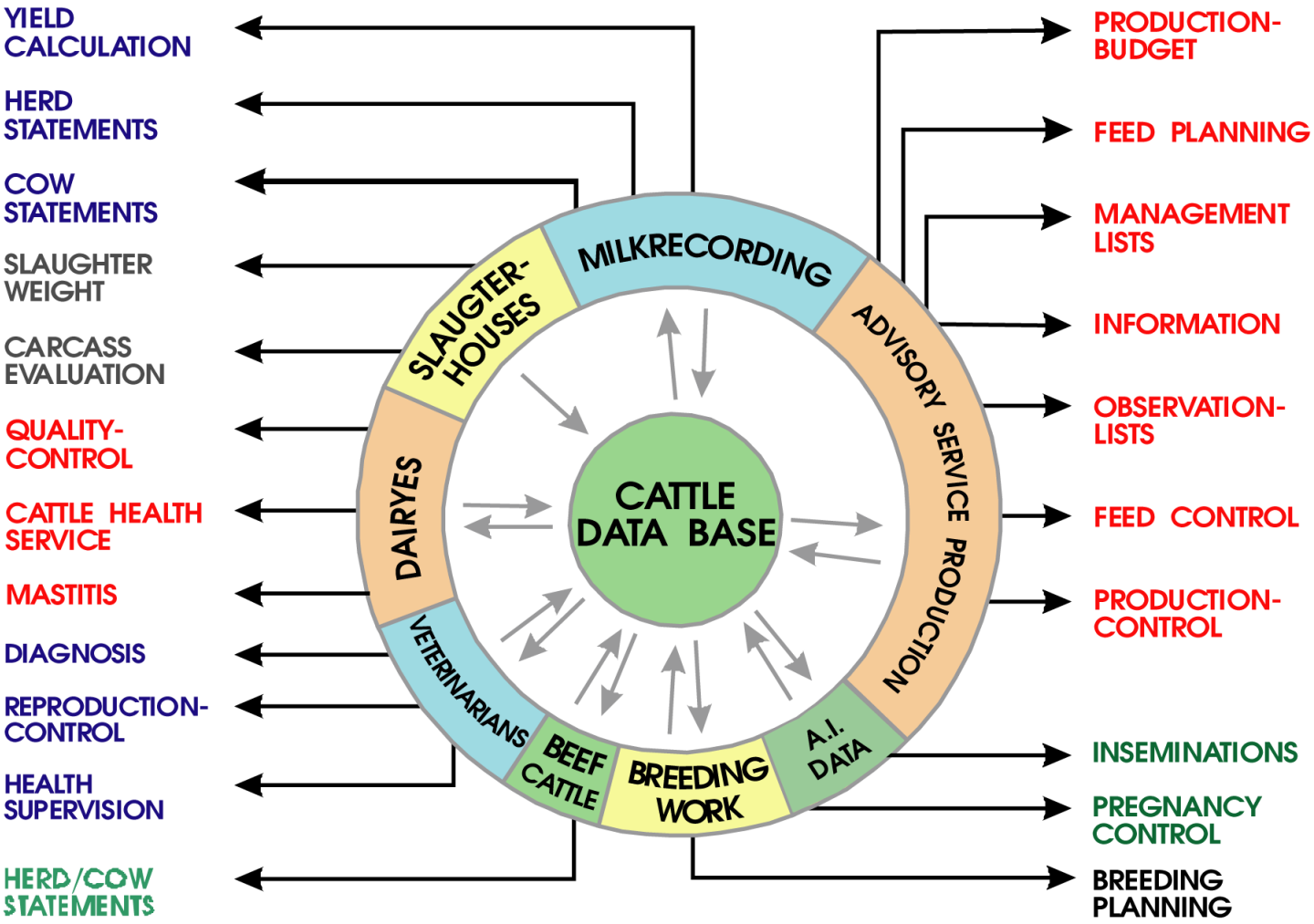
# DANISH CATTLE DATABASE - THE CONNECTING ELEMENT



# Data flow in the Central Danish Cattle database

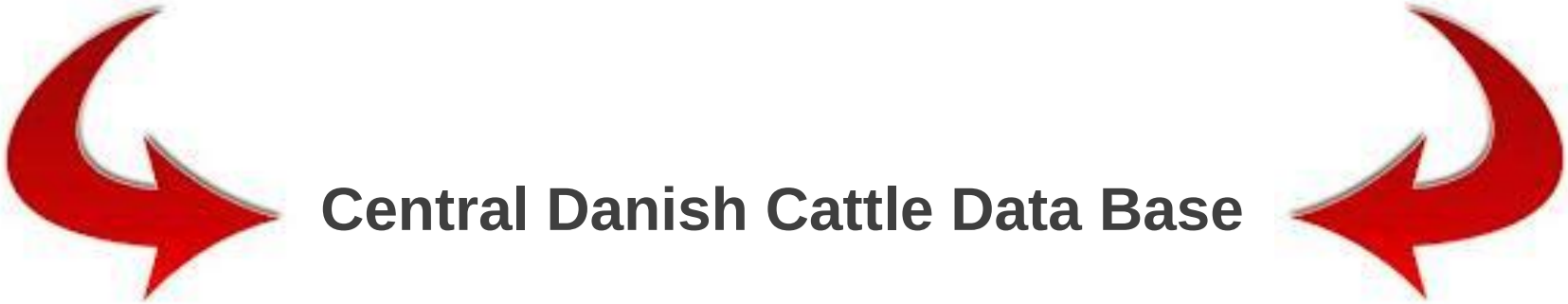
**Traditional data related to**

- **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!

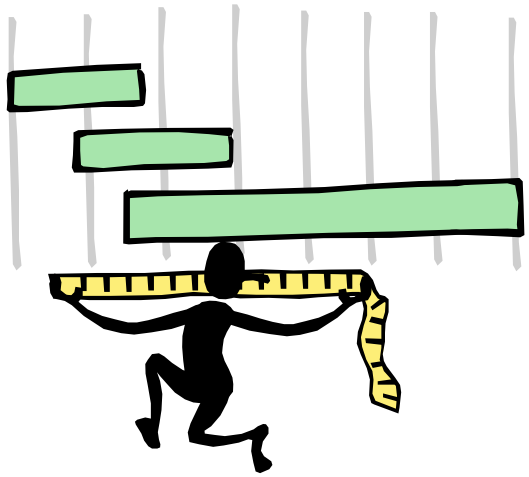
# Breeding opportunities to exploite


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**

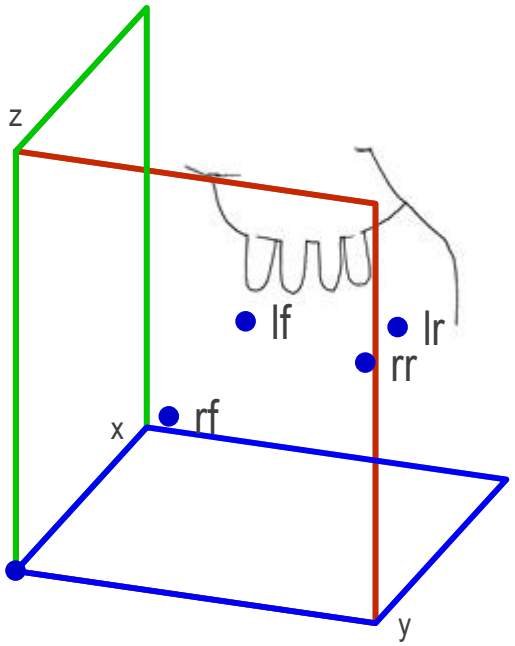
- Classified by experienced classifiers

**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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