



KNOWLEDGE CENTRE FOR AGRICULTURE
Cattle

Recording of data and identification issues - New recordings and use in genetic evaluation

Anders Fogh and Line Hjortø

Knowledge Center for Agriculture, Agro Food Park 15, 8200 Aarhus N, Denmark

Gert Pedersen Aamand

Nordic Cattle Genetic Evaluation , Agro Food Park 15, 8200 Aarhus N, Denmark

Uffe Lauritsen

RYK – Livestock Registration and Milk Recording, Agro Food Park 15, 8200 Aarhus N, Denmark

PARTNER IN
DLBR[®]
DANISH AGRICULTURAL
ADVISORY SERVICE



Den Europæiske Union ved Den Europæiske Fond for Udvikling af Landdistrikter og Ministeriet for Fødevarer, Landbrug og Fiskeri har deltaget i finansieringen af projektet.

Recordings and central collection in Denmark

- Traditional recordings
- New recordings within the last 5 years
- New recordings the next 5 years

Traditional

Milk recording



AI technicians



Farmers



Slaughter houses



Veterinarians

Last 5 years



AMS systems



Veterinarians – mandatory

- Lely today (project) and others later
- Yield per quarter, milking time, weight, activity, rumination ect.
- Extraction by milk technicians
- Potentially 26% of all cows
- Recorded weekly or fortnight
- Score of ketone bodies and uterine score and others
- Automatically from vet PC to Central Database
- 40% of all herds (larger herds)

Last 5 years



Hoof trimmers

- Recorded at visit – tablet pc
- Automatically from pc to Central Database
- Disease and severity
- 40% of all cows



- Milk amount and milking speed
- Extraction by milk technicians
- 60-70% of all cows

TruTest Milk Meters

Last 5 years



SNP's

- Tissue sampling
- 54K and 10K
- Automatically from lab to Central Database
- 2,500 cows in 2012 – increasing!

Next 5 years

Milk recording - New lab tests



- Pregnancy tests and BHB (beta-hydroxybutyrate)
- Automatically from lab to Central Database
- Starts in 2014



- Methane from expiratory air in AMS systems
- Data transfer to Central Database?
- Test phase

Methane measure

Next 5 years



Activity and rumination

- Over 1,000 stand-alone systems
- New system can transfer data
- No start time



Urine and faecal samples

- Dry matter content, energy efficiency and others in feces
- Urea and others in urine
- 1,000 cows yet

Central Danish Cattle database - the connecting element

Traditional records

- Displayed only on printouts from database
- Transfer is an integrated part of registration



New records

- Some times extracted from "Management program"
- Transfer is a challenge

New records

- Better management today
- But as a spinoff – better breeding values tomorrow

Data on central database is a good idea!

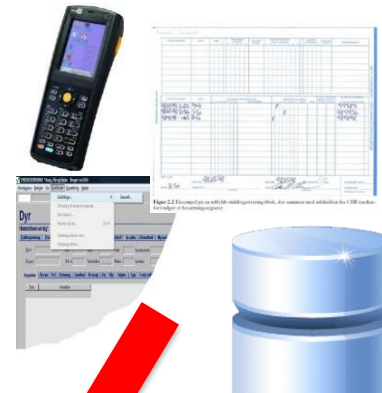


Farmers with AMS



Add extra value in combination to management!

Data on central database is a good idea!



Rest of talk about genetic use of data

All farmers



More genetic progress used in combination!

New registrations can improve estimation of breeding values

- New traits – economic importance
- More recordings – higher reliability
- Correlated traits – higher reliability

More genetic progress – higher productivity

**Estimation of breeding values are done jointly in
Denmark, Sweden, and Finland**

New traits

Claw health:

- Claw diseases are related to large economical loss
- Recording started in 2010 in Denmark – earlier in Sweden and Finland
- Index for claw health in 2011
- Included in Total merit index (NTM) in 2011



New traits

Feed efficiency:

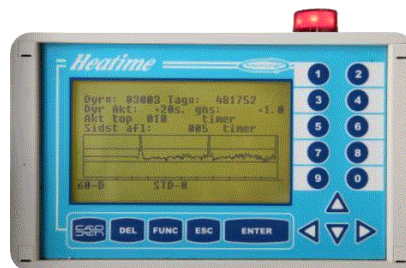
- Higher feed efficiency -> higher productivity – economic important trait
- Direct measure is expensive – only research herds
- Use of indicators might be feasible way to make genetic progress



New traits

Feed efficiency:

- Possible indicators
 - Rumination time
 - Methane measure
 - Faecal samples - digestibility
- Medium to large scale collection
- Project in 2013-2016



More recordings

Milking speed

- Originally only “Farmer evaluation”
- TruTest milk meters
 - Flow of fat+protein
 - Same trait as “Farmer evaluation”
 - Included in genetic evaluation (2011)



More recordings

Milking speed:

- Recordings from AMS
 - Flow of fat+protein
 - Research project



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)	-	-

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

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

More recordings



All traits:

- **SNP information can be considered as new records on existing traits**
- **Collection started in 2008**
- **No. records from females are increasing with decreasing test prices**
- **Included in routine genetic evaluation in 2011**

Correlated traits or better phenotypes

Udder health and metabolic diseases



Today: veterinarian diagnoses

Not objective measure of disease. Depends on farmers:

- Ability to observe
- Threshold for initiating treatment

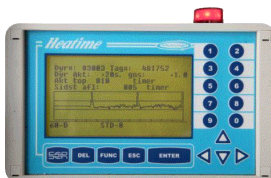
Correlated traits or better phenotypes

Udder health and metabolic diseases

Future indicators of disease:

- Milk yield per quarter
- Weight change
- Rumen activity
- BHB/Systematic health recording

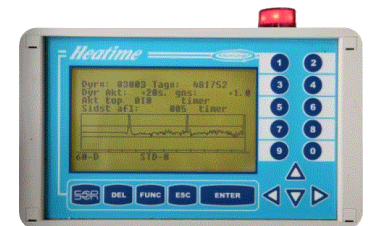
Combining registrations - better phenotype of health status/correlated information



Correlated traits

Fertility:

- Originally, CF, IFL, NoINS
- Largely affected by management and farmer skills
- Activity is more objective trait
- PhD project 2011-2014



Conclusion

- Many new recordings in the last 5 years - more will follow in the next 5 years
- In relation to breeding
 - Some have been implemented
 - Some are underway
 - Others have to be analyzed
- Better breeding values -> faster genetic progress

