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
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
AMS systems

Veterinarians – mandatory

Last 5 years

- Lely today (project) and others later
- Yield per quarter, milking time, weight, activity, rumination etc.
- 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**

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

**Hoof trimmers**

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

**TruTest Milk Meters**
Last 5 years

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

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

Methane measure

- Methane from expiratory air in AMS systems
- Data transfer to Central Database?
- Test phase
Next 5 years

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

Activity and rumination

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

Urine and faecal samples
Central Danish Cattle database  
- the connecting element

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

New records
- Sometimes 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.)

<table>
<thead>
<tr>
<th></th>
<th>h²</th>
<th>Rg - Assessments</th>
<th>Rg - Flow, milk meters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow, robots¹</td>
<td>0.63 (0.07)</td>
<td>0.91 (0.05)</td>
<td>0.94 (0.03)</td>
</tr>
<tr>
<td>Assessments</td>
<td>0.20 (0.02)</td>
<td>-</td>
<td>0.91 (0.02)</td>
</tr>
<tr>
<td>Flow, milk meters²</td>
<td>0.41 (0.01)</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

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