The challenge in today’s milk production

- Staying profitable in spite of declining milk prices
  - Increase herd size
  - Higher milk yield
  - Improve feeding efficiency

- Ensuring professional and cost-effective farm operation

- Reproduction control

- Reduce risk of diseases
  - Udder health, Ketosis, Metabolic disorder

- Complying with strict rules concerning animal welfare and environmental issues
Consolidation in dairy business

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Danish Milkproduction 2006-2015

Source: Dansk Køeg Nyt, September 2006

Joint venture

We drive progress in milk production

Joint R&D Company

Hilleroed Denmark

We deliver dedicated analytical solutions

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The history of in-line measurements
– a strategic effort of research!

- Memo project at Skovgaard experimental station (1990 – 2000)
  - 14 parameters investigated for 10 years – including 653 lactations
  - FOSS as a service partner

- Biosens research consortium
  - Lattec (FOSS and DeLaval)
  - Danish Institute of Agricultural Sciences
  - Danish Cattle Research Centre
  - Danish Cattle Federation
  - Supported by Ministry of Agriculture

Herd Navigator flowdiagram
Herd Navigator monitors

<table>
<thead>
<tr>
<th>Focus area</th>
<th>Parameter analysed in milk</th>
<th>Early/on time detection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reproduction</td>
<td>Progesterone</td>
<td>Heat</td>
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<tr>
<td></td>
<td></td>
<td>Silent heat</td>
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<td></td>
<td></td>
<td>Pregnancy</td>
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<td></td>
<td></td>
<td>Abortion</td>
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<td>Cysts</td>
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<td></td>
<td></td>
<td>Anoestrus</td>
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<tr>
<td>Udder health</td>
<td>LDH – lactate dehydrogenase</td>
<td>Mastitis</td>
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<tr>
<td></td>
<td></td>
<td>Subclinical mastitis</td>
</tr>
<tr>
<td>Feeding and energy balance</td>
<td>Urea</td>
<td>Feed ration – protein</td>
</tr>
<tr>
<td></td>
<td>BHB – beta hydroxybutyrate</td>
<td>Ketosis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Subclinical ketosis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Secondary metabolic disorders</td>
</tr>
</tbody>
</table>

Reproduction

![Reproduction status – progesterone profile chart](image)
Mastitis

- LDH is the parameter measured, correlation with SCC is very high.
- Consolidation of the test farm data from veterinarians, advisors and Herd Navigator is ongoing.
- HN is able to find clinical and sub-clinical cases.
- Herd Navigator alarms are triggered 3-4 days prior to visible clinical signs.

Ketosis

- Herd Navigator finds approximately 50% more Ketosis cases than the test farmers identify.
- Ketosis alarms can be caused by several disorders.
- Not only typical ketosis cases are found, we detect all cases of Cow Fat Syndrome (NEFA cows).
- Consolidation of the test farm data from veterinarians, advisors and Herd Navigator is ongoing.
Field trials in Denmark

- **Test farm 1**
  - 190 Jersey cows
  - HB 2x10

- **Test farm 2**
  - 130 HF cows
  - HB 2x8

- **Test farm 3**
  - 140 HF cows
  - Organic farming
  - Tandem 2x5

- **Test farm 4**
  - 160 HF cows
  - SBS 2x10

- **Test farm 5**
  - 120 Cows
  - HB 2x10

- **Test farm 6**
  - 130 cows
  - HB 2x12

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Value for the farmer

**Reproduction**

- Early focus on heat and optimal time of insemination
- Increased pregnancy rate and reproduction efficiency
- Less work with special treatments
- Herd Navigator detects 95% of all heats
Value for the farmer

Udder health

- Keep healthy animals healthy!
- Early focus on changes in milk components
- Fewer and less severe cases of mastitis
- Reduced milk loss and decreased use of medicine
- Increased milk quality and less work with special treatments
- Herd Navigator detects >80% of all mastitis cases

Value for the farmer

Nutrition balance

- Early focus on discrepancies in energy and protein balance
- Fewer nutrition related disorders
- Fewer cows show “stress syndromes”
- Improved forage quality
- Herd Navigator finds 50% more Ketosis cases than the test farmer
Value for the farmer

- Surveillance
  - Focus on the “right” cows
  - Prevention instead of treatment
  - Focus on gathering information
    - reduced time consumption
  - Automation of practical tasks

Proven preliminary values from the 6 test farms

- Reproduction € 40 - 110
- Ketosis € 15 - 38
- Mastitis € 47 – 186
- Other € 47 - 80
- Total per test farm € 173 - 307
Status today

- Six test farms operational in DK (2 for > 4 years)
- Success criteria fulfilled
  - Robustness and performance
  - Verification of Biomodels
  - Validation of Standard Operational Procedures
  - Proven farmer added values and profit
- Launched at Agromek expo in DK Jan 2008
- Released for sales in Denmark May 2008

Future

- Planning reference installations in 2 new regions 2008
- Start up of cooperation with central herd improvement organizations
- Continued development of Herd Navigator for
  - Greater than 2x14 parlours
  - Other parlour brands
  - DeLaval VMS
  - Other AMS brands
  - Rotaries
  - New parameters
Distribution in Denmark

DeLaval
Automation of milking

Herd Navigator
Sales Company

FOSS
Automation of Analysis

dansk kvaeg
Education and advisory services

More information

www.herdnavigator.com
- Video
- Brochure & Facts Sheets
- Press release
- Q&A

www.lattec.com
- Scientific publications