Perspectives for proactive dairy herd management based on on-farm milk analysis and potential implications for future milk recording

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Purpose of this presentation
- To present some results from the Biosens models, on DCRC data and from the two commercial test farms
- To discuss the need for ICAR specifications to on-farm measurements

Lattec’s solution, an overview...
- Established in 2001
- 50:50 partnership between DeLaval and FOSS
- Development, market preparation and production
- Sales via owners:
  - DeLaval to the farmers
  - FOSS via existing customers
- Situated in Hillerød

Standard Operating Procedures are created!
- Biosens, a research consortium between DIAS, DCRC and Lattec
- Biosens builds models, Lattec implements, - and we test the models together, creating SOP’s.
  We focus at:
  - Mastitis
  - Heat, reproductive disorders and pregnancy
  - Ketosis
  - Imbalances in feeding

Mastitis, - typical example
- LDH * Yield
- Daily yield, rolling average
- Mastitis alarm

Local Solution: integrated in the DeLaval Herd Management System
Central Solution: developed together with Danish Cattle Federation, using available information from the central cattle data base
Mastitis: Alert Nov 9th, detected Nov 12th, treated Nov 15th (com. test farm)

Ketosis, Lattec alert Oct 19th and Nov 1st, owner detection Oct 24th and Nov 4th

Reproduction

Energy model, - including fat and protein?

- Lattec’s purpose for measuring fat and protein
  - To detect upcoming metabolic disorders
  - To improve feeding and reproduction management
- ICAR’s purposes for measuring fat and protein
  - For improving feeding and reproduction management
  - For breeding purposes

So we do have mutual interests!

Mutual target!

- Holistic view. Not only talk repeatability and bias
- Go for an overall improvement of the whole system. Not only parts of it.

Contributors to inaccuracy in measured results

- Correct sample ID
- Sample quality at measurement
- Measurement frequency
- Repeatability and accuracy (bias) of the measurement.
- Day-to-day variation in fat/protein content of the milk sample
Day to day variation in fat content (DK results)

- Fat% morning and evening

- Days from calving

Day-to-day variation, now two data sets:

- **DK-dataset:**
  - 1 herd, 11 cows randomly selected, monitored all lactation

- **CA-dataset:**
  - 14 herds, 10 cows from each, each cow is monitored for 5 days.

Standard deviation (fat) over 5 days

Average CV:
- (DK): 5.25
- (CND): 6.40
- Parlor 1: 6.43
- Parlor 2: 6.54

DHIA today

Average CV (MSC) = 0.5 %, or SD(instrument) = 0.023 = B
SD(total) = 0.34 = C (7.3 % CV, 0-60 days)

A² + B² = C² or,
SD²sample + SD²instrument = SD²total

Today:
SDsample = (0.34)²/total = (0.34/total), or
SDsample = 0.33

On-farm, if CV% is 1.5%:
(x)²sample + (0.07)²instrument = (0.34)²total, or
SDsample = 0.33

How do these results compare to today’s practice?

One approach....

CV% = (SD x 100%)/Av fat % - Av Fat% = 4.5%

CV (MSC) = 0.5 %, or SD(instrument) = 0.023 = B
SD(total) = 0.34 = C (7.3 % CV, 0-60 days)

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On-farm, if CV% is 1.5%:
(x)²sample + (0.07)²instrument = (0.34)²total, or
SDsample = 0.33
Conclusion:

- Total variation around 7-10% at the beginning of lactation seems to be the case.
- A number of error sources are abolished or minimized with on-farm analyses, a few increases.
- We should use all information available to improve the total setup, instead of focusing only on parts of the system.
- Work to establish technical specifications for on-farm analyzers is needed.

Acknowledgements:

- Dr Dave Kelton, Dr Karen Hand, University of Guelph, Canada
- Dr Carsten Ridder, Lattec, Denmark
- Dr Peter Løvendahl et al., Danish Institute of Animal Science

Focus is on start of lactation!

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For all lactation:

- Average CV (DK): 5.25, (SD = 0.24)
- Average CV (CND): 6.40, (SD = 0.29)
- Average CV Parlor 1: 6.43
- Average CV Parlor 2: 6.54