Technical Session 4: Future Daily Yield Calculations for Cattle

Global 24-Hour Calculation trends in Classical Milk Recording Systems

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Dairy Cattle Milk Recording Working Group
- Update and improve Section 2 of ICAR Guidelines
- 24-hour calculations
  - Classical Milk Recording and Automatic Milking Systems
- Analyse situation in Milk Recording Organisations
  - From a SURVEY to know needs and expectations
- Establish a future policy and recommendations
  - Harmonising of practise in world wide
- Benchmarking for organisations
Description of the survey

- 90 questions about 24-hour calculation
  - Defined and validated
- Several sections
  - Practical experiences with ICAR methods
  - Problem areas, priorities and needs
  - Processes used to estimate coefficients and factors
  - Types of statistical indicators used
- Two mains parts
  - Classical Milk Recording Systems & Automatic Milking Systems
Part on Classical Milk Recording

- Participants
- Practical experiences on 24-hour ICAR methods
  - Delorenzo and Wiggans, 1986
  - Liu and al, 2000
  - Hand and al, 2006
- Other methods used
- Calculation of factors and coefficients
  - Collecting of data
  - Statistical method
What are the results and trends on Classical Milk Recording Systems?
Answers

Data from 52 organisations in the world!

Participants

World map by www.freeworldmaps.net

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Participants

Many thanks to the members of organisations!

Delorenzo and Wiggans method

Do you use this method?

- Method simple
- Easy to understand
- Practical to use
- Factors and coefficients published in ICAR Guidelines

Number of organisations

- Yes: 13
- Yes, but with some adaptations or changes: 3

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What’s the origin of the factors you use?

- Most of MRO’s use factors from Guidelines
- Difficulties to define own factors
- Require accumulated experience and knowledge

Number of organisations

- Use of factors and coefficients from ICAR Guidelines
- Use of factors and coefficients from other countries
- Use our own factors and coefficients

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Which sampling schemes do you use for this method?

- Mostly use for T and Z schemes
- Some organisations propose both schemes
- Not use currently for C scheme

Number of organisations:

- T scheme: 7
- Z scheme: 11
- C scheme: 0

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Delorenzo and Wiggans method

Which milking frequencies do you use this method for?

- Use with 2x per day milking
- Also with 3x per day milking
- Not with 4 or 6 per day milking

Number of organisations

- 2x per day milking
- 3x per day milking
- 4 to 6 per day milking

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How do you define milking times when using this method?

- Most common option is milking time on herd
- Mainly start time
- 2 organisations use individual start time
- No organisation combine different options

Number of organisations:

- Milking start time on herd: 12
- Middle milking time on herd: 3
- Milking start time on group: 1
- Middle milking time on group: 1
- Milking start time individual: 0

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Delorenzo and Wiggans method

Other comments and experience regarding this method?

- Saw teeth effect with short or long milking interval
- It works well as long as we get accurate times from dairy farm
- It works very well but problems with 3x milkings in am sample
- We have a lot of issues with calculation of fat (and SCC)
- In our experience, the comparison with delivered milk to dairy companies seems to be reasonably correct
- We have no performed any scientific study on this method
- We use this method for 3x milkings
- We don’t think it works well in the case of big herds
Do you use this method?

- Used by 11 organisations
- 3 organisations adapting some equations
- 2 organisations making other adaptations

Number of organisations:

- Yes
- Yes, but we adapt some equations
- Yes, but we employ adaptations, parities...
Which sampling schemes do you use for this method?

- Mainly use for T scheme
- 3 organisations use it for Z scheme
- 5 organisations for C scheme
- Some organisations use this method for both schemes

Number of organisations

- T scheme: 5
- Z scheme: 3
- C scheme: 10
Which milking frequencies do you use for this method for?

- Use mainly with 2x per day milking
- Also with 3x per day milking
- Not with 4 or 6 per day milking

Number of organisations

- 2x per day milking
- 3x per day milking
- 4 to 6 per day milking
How do you define milking times when using this method?

- Most common option is milking start time on herd
- 3 organisations use start time on group level
- 1 organisation uses individual start time (most accurate approach but frequently unavailable)
Liu and al method

Other comments and experience regarding this method?

- It can work well but milking start time is not recorded accurately
- In our model, we added another class of milking interval
- No problems with this method
- Very good results with this method
- Due to changes in milk yield and fat content over the last 15 years, a new model will be established in 2019
- The new version will be presented during Prague conference
- ICAR Guidelines will be updated one new coefficients presented
Herds where regular milking intervals don’t create 24-hour?

- 7 organisations specify that regular milking intervals don’t create 24-hour
- It concerns more than 10% of herds for 2 organisations
- 5 organisations for less than 10% of herds

Number of organisations:
- Yes, less than 10% of herds
- Yes, more than 10% of herds

2 organisations stated that it concerns more than 10% of herds.
Do you use milk from more than one day when using EMM?

- Most organisations use data from one day
- 8 organisations in accordance with ICAR Guidelines
- When using multiple number of days the issue is animal identification

- One-day milking data
- Data from several days as ICAR
- Data from several days with adaptations
- 24-hour yields from days number differently
In measurement period, how do you treat the sampling date?

- Most common method is to add the sampling date
- Excluded the measurement is less common

Number of organisations:
- The sampling date is excluded (6
- The sampling date is added (2

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How do you connect milk yields with milk analysis results?

Number of organisations

- Half of the organisations uses connection between results of milk analysis and test-day
- The other half uses multiple number of days

Milk yield from a longer measurement period
Milk yield on the sampling day only
Hand and al method

Other comments and experience regarding this method?

- Milk yield is stable with an average of 7 days and samples corrected by intervals between milkings
- It would be necessary to improve this method in the future
- Overall this method is doing well
- It seems to be relevant for management purposes
- Very limited use only on test-day milk yields
Do you use other methods not mentionned in the Guidelines?

- There are 3 cases of classical milk recording methods not described in ICAR Guidelines
  - 2 cases in T scheme
  - 1 case for other cases
- These cases will be discussed, checked and analysed by DCMR WG

Number of organisations

- Yes for sampling scheme T
- Yes for sampling scheme Z
- Yes for sampling scheme C
- Yes for other cases
Do you estimate your own factors and coefficients?

- Half organisations use their own factors and coefficients
- Poor data collection for coefficient estimation
- Most important problem is to find a very large reference data set
- Considerable variability among organisations which estimate factors, coefficients
Estimating factors and coefficients

How long does it take to calculate data for est./rec. coefficients?

- The majority of answers shows that recalculations are performed in regular intervals
- Over 10 years for 2 organisations
- The DCMR WG will add recommendations to the new version of ICAR Guidelines on minimum and optimum number of herds, cows, milkings, lactations
How do you choose herds/cows for estimations/recalculations?

- The majority of organisations uses all data available
- For one organisation, herd sampling covers all national territory
- For another organisation, the coefficients are calculated randomly for half the population and validated against the other half
Estimating factors and coefficients

Which data are excluded?

- Most of organisations exclude records with missing information, duplicate records, large differences in milk yield
- Several organisations use criteria: interval between milkings (greater than 16 hours,…), lactation stage (greater than 360 days,…), number of lactations (greater than 9,…)

Number of organisations

- Duplicate records
- Records with missing information
- Intervals between milkings
- Differences in milk yield between milkings
- Lactation stage

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Are there any differences between breeds?

- The majority of answers specified no differences between breeds
- Reference data for breeds with small number of animals are unavailable

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<tr>
<th>Number of organisations</th>
<th>Yes, different factors are used for different breeds</th>
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<td>13</td>
<td>5</td>
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How do you evaluate results and which indicators do you use?

- The majority of answers indicates a preference for correlation, mean, bias,…
- Some organisations combine indicators from more groups
- Recommendations will be added to the new version of ICAR Guidelines

- Correlation between esti./pred. and actual/true daily yields
- Comparison of mean, standard deviation
- Systematic bias, SD of differences and accuracy (R2)
This survey obtained a very good score with 52 answers
A trend towards simplifying milk recording process and reducing the number of samples is evident
3 organisations use methods not contained in ICAR Guidelines
The general trend is to calculate own factors
Coefficients and factors are regularly checked
Organisations use relevant statistical indicators

There is a lot of material to improve ICAR Guidelines and to propose new recommendations on 24-hour
Thank you for your attention