IT-Solutions for Animal Production

Alternated milk recording - recalculation, results and conclusion for future test planning

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vit – Who we are!

- non profit organisation, owned by DHI, AI and Herdbook organisations

- vit provide services for
  - Herdbook and AI-organisation (all Germany and Luxembourg)
  - Genetic evaluation (all Germany, Austria and Luxembourg)
  - Identification and registration (regional)
  - DHI organisation

- our service for DHI organisation
  - data processing and verification
  - data collecting software for electronic devices
  - laboratory software to connect farm data and milksample data
  - data supply for all kind of herd management
    - paper
    - software
    - web based
  - do research and development for our customers

Introduction of alternated milk recording in Germany

- **alternated milk recording an alternative in germany since the late 90's**
  - driven by
    - costs for DHI service
    - problems to require staff
    - retantion against owner based milk recording

- **to calculate own factors dedicated and high motivated farmers participate at a large field study over a year**
  => Result: Methode of Liu et al. published in 2000 and part of the ICAR guidelines

- **introduction into practice with discussion about**
  - accuracy and comparability of results
  - influence on calculation of breeding values

- **since 2010 the proportion of alternated milkrecording is nearly constant 24-26 % of farms, 19-20% of cows**

- **new factors for milk yield in 2008 but not for fat % (protein %)**

Development of DHI farms

| Year	Nortwest germany						east germany					
	Nr Farm	cows	Cow/farm	Mkg	F %	E%	Nr Farm	cows	Cow/farm	Mkg	F %	E%
1995	29.462	961.223	33	6.908	4,27	3,33	4.764	948.510	199	5.702	4,44	3,48
2000	23.686	930.044	39	7.674	4,25	3,38	4.404	850.044	193	7.388	4,26	3,46
2005	18.751	924.470	49	8.118	4,17	3,41	3.794	780.480	206	8.362	4,09	3,42
2010	13.474	814.705	60	8.619	4,13	3,40	3.073	718.806	234	8.900	4,07	3,39
2015	12.797	1.042.037	81	8.705	4,05	3,39	2.496	747.422	299	9.404	3,97	3,38
2018	10.799	1.046.752	97	9.106	4,00	3,42	2.072	672.056	324	9.750	3,93	3,41

- as expected:
  - a decrease of farms
  - an increase of milkyield (~3,000 kg)
  - a decrease of fat % (~ 0,38 % point)
  - stable protein %
  - the number of cows increased

Milking interval at farms (~10,500)

% of farms in interval classes

Legend: Intervall between evening and morning milking
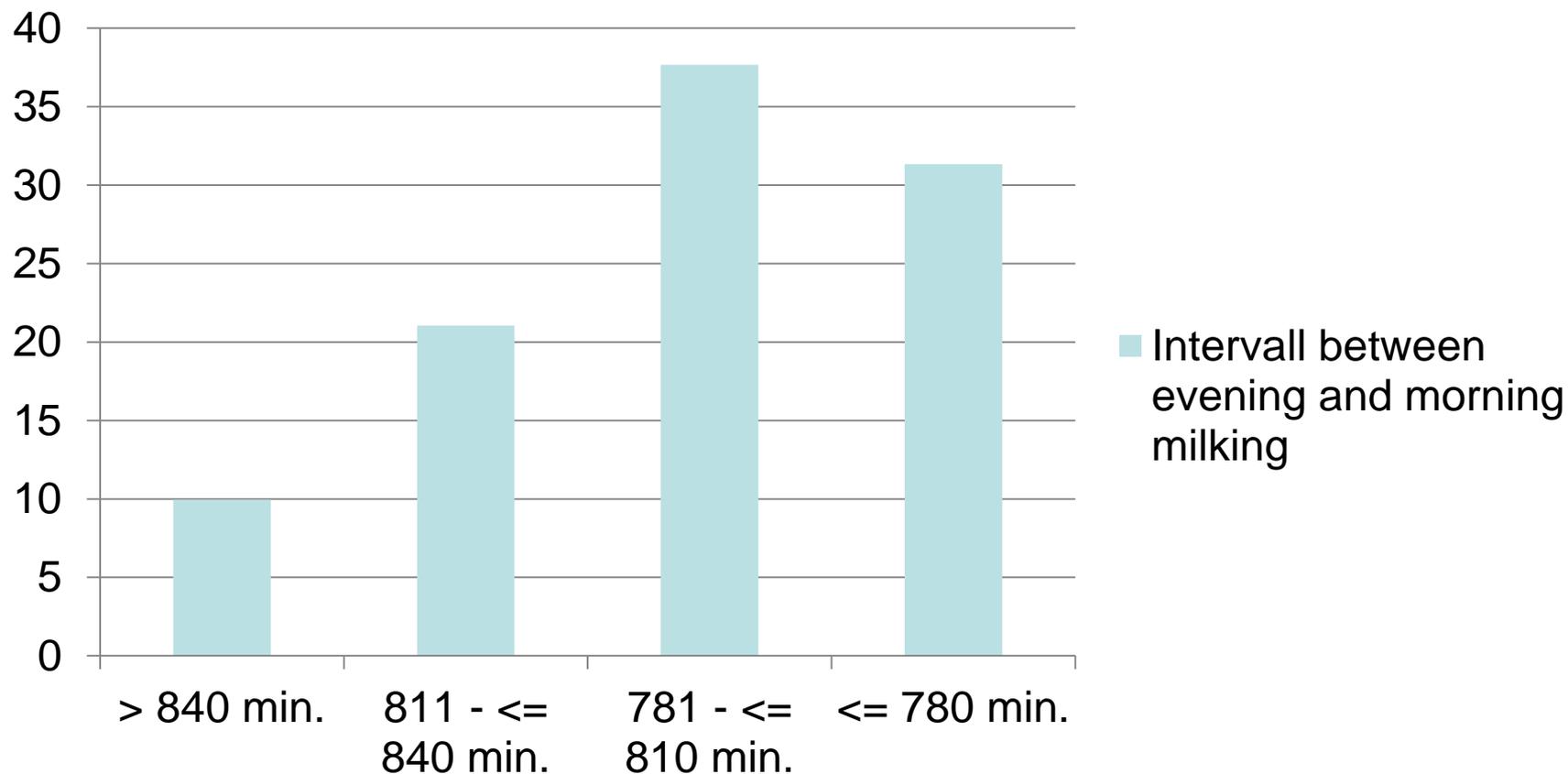
Testplaning

- 2 data sets

- one for estimation
  - preselected farms
    - milking intervall
    - size

- one independent data set for validation
  - to compare actual formulas and true results with new formulas
  - criteria (within and over all classes)
    - systematic bias: mean difference
    - random error: std.dev. of the difference

Data collection for estimation of new formulas

for estimation

- data collection in 2017
- 3 month, 135 farms, 20.810 cows
- testing every month over 2 days (4 samples)

validation:

- 700,000 milkings
- cow individual milking times
- 2 milk yield, 2 sample

Results

- the new model considers
  - daytime (morning/evening)
  - **milking intervall (8 classes for every daytime)**
  - lactation number (2 classes: 1, 2 +)
  - **lactation stadium (7 classes: each 60 days, (last class open)**

- the results are different to the old ones

- more milking intervall classes represent better the real situation on farms

- new formulas shows better accordance for cows with high milk yields

- subjectively a smaller saw-tooth-effect for milk yield and fat %
  - evaluation through the next month

- subjectively less reclamation of farmers after implementing new model at the begin of 2019

Challenges

- for estimation the minimum number of observations per subclass should be >1000 (better 2000)

- data edits
  - How to handle/consider extreme performances in the dataset for estimation?
  - Balance between plausibility checks/edits and future application on extreme yields
  - As more extreme data we accept for estimation as less fit for „normal" yields

- we should not use more information for derivation of formulas as we have later in routine application available

General Remarks

- re-estimate formulas every 5-8 year
  - Significant increase in average yields
  - Significant change in correlations between milk yield and milk contents
  - …
- We need data from representative herds, i.e. herds in which we have to adopt the (re)-estimated formulas later

- Data for (re)-calculation should cover all environmental subgroups resulting potentially in different formulas, i.e. breeds, regions, milking intervals, …..

- Data should be large enough for splitting into a
  - Learning/estimation sample (2/3)
  - Validation sample (1/3)

Thanks for your attention!

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