24-hour yield calculations in the Finnish milk recording

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Introduction to Finnish Milk Recording

- 4500 recorded herds, 48 cows in average
- 49% Holstein, 49% Ayrshire
- 82% of all cows recorded
- 9795 kg milk, 4.30% fat, 3.52% protein
- > 1000 robotic herds
- > 95% farmer recording (B)
- > 90% of data capture done by farmers
- Milk meters mainly owned by farmers
- 90% of samples from one milking only
- Recording intervals 2, 4, 6 or 8 weeks

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A bit of history

- Until 2003, the only official option was proportional sampling
- Easy to calculate
- Robotic milking started in 2001 (3 herds)
- Predominantly a farmer-recording system
  - Farmer sampling started in the 1970's
  - Guideline vs. reality
- In 2003, fat corrections & milk-sum method were introduced
- In 2015, the milk-sum method was scrapped

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Situation with traditional milking systems

- Milk weights are measured at two (or three) consecutive milkings
- 10% of the herds still claim to take proportional samples -> no correction needed
- The vast majority takes one-milking samples
- Fat content corrected by the Delorenzo-Wiggans method (1986)
- For this, the farmer reports the start time of sampled milking and previous milking
- 3x milking (~20 farms) with no correction

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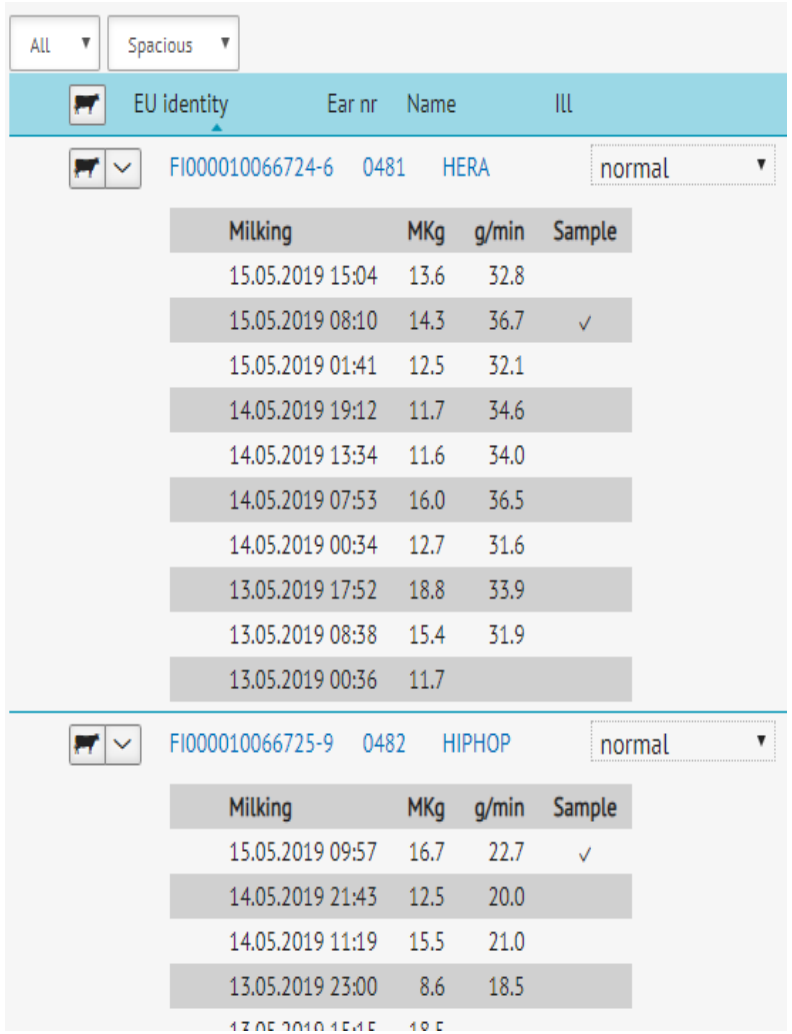
Situation with automatic milking systems



- Milk weights are measured during 96 hours on herd level
  - All milk weights and milking intervals are used in 24-hour yield calculation
- Samples are taken from one milking towards the end of the measurement period
  - Fat and protein yields are calculated by the updated Galesloot & Peters method
  - Two milkings and two preceding intervals + some data about the cow
- Some problems in herds with morning sampling

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How are the methods working?

- **A comparison of ready, corrected and calculated 24-hour yields**
- **Period from June 4th, 2018 to June 3rd, 2019**

Method	Samples	Milk, kg	Fat, kg	Fat, %	Protein, kg	Protein, %	Cells
One-milking (Z) sample, milking time 4-10 AM	255,461	29.8	1.28	4.30	1.07	3.58	157
Z sample, milking time 2-8 PM	309,974	30.2	1.36	4.51	1.09	3.61	187
Proportional (P) sample	112,620	29.6	1.31	4.41	1.07	3.61	167
Z sample, automatic milking	370,908	33.4	1.41	4.23	1.19	3.56	214

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How are the methods working? – part II

- **Holsteins only**
- **A comparison of ready, corrected and calculated 24-hour yields**
- **Period from June 4th, 2018 to June 3rd, 2019**

Method	Samples	Milk, kg	Fat, kg	Fat, %	Protein, kg	Protein, %	Cells
One-milking (Z) sample, milking time 4-10 AM	116,009	31.3	1.31	4.17	1.10	3.52	161
Z sample, milking time 2 to 8 PM	142,204	31.9	1.39	4.36	1.14	3.56	184
Proportional (P) sample	45,191	31.4	1.34	4.25	1.12	3.55	167
Z sample, automatic milking	231,346	34.8	1.44	4.14	1.22	3.52	216

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Conclusions

- **Present methods are working on a satisfactory level**
- **Present methods give the farmer a lot of freedom while the MRO still knows what is going on**
- **Making things more complex for the farmer is not an option -> simple means less mistakes**
- **Interested in cooperation towards better estimation of fat and cells from one-milking samples**

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