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
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
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
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
How are the methods working?

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

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

<table>
<thead>
<tr>
<th>Method</th>
<th>Samples</th>
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<th>Protein, %</th>
<th>Cells</th>
</tr>
</thead>
<tbody>
<tr>
<td>One-milking (Z) sample, milking time 4-10 AM</td>
<td>116,009</td>
<td>31.3</td>
<td>1.31</td>
<td>4.17</td>
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<td>3.56</td>
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<td>Proportional (P) sample</td>
<td>45,191</td>
<td>31.4</td>
<td>1.34</td>
<td>4.25</td>
<td>1.12</td>
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<tr>
<td>Z sample, automatic milking</td>
<td>231,346</td>
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<td>1.44</td>
<td>4.14</td>
<td>1.22</td>
<td>3.52</td>
<td>216</td>
</tr>
</tbody>
</table>
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