Operative background of the Hungarian farm monitoring system based on milk and TMR analyses

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Milk recording system in Hungary

1. The unified and regular milk recording of dairy cattle: since 1910 (105 years)

2. Hungarian Holstein Association: Livestock Performance Testing Ltd (LPT Ltd)- responsible laboratory

3. Appr. 178,000 dairy cows (85% of the Hungarian population) were recorded in 2014.

4. These cows were held in 461 farms (av. dairy cows number per farm: 387 in 2014).
Introduction

1. The company established the Feed Laboratory in 2012. This is the first independent **NIR laboratory** in Hungary, which is specialized for forages. Our mission is to help farmers in Hungary and in Central Europe.
Introduction

1. At the beginning of 2014, with contribution of 130 farms, a countrywide monitoring system has started by the Milk Laboratory and the Feed Laboratory of LPT Ltd, based on TMR- and milk sample analyses.

2. By now:

   – **250 farms have** contracts with LPT Ltd. (MILK)
     * 49,5% of the recorded dairy herd
   – **130 farms** contracts with LPT Ltd. (MILK and TMR)
     * 28% of the recorded dairy herd
**Introduction**

The aim is to evaluate the actual nutritive value of the high milking dairy cow diet having potential effect

1. on milk production
2. on milk composition
3. on animal health (SARA risk assessment - prognosis)
Material and methods

Sample taking and receiving by the Milk and Feed Laboratories

1. PLAN: shipping of sampling boxes to the farm by a monthly plan.

2. MILK SAMPLING: Sampling by official milk sampling technicians.

3. TMR SAMPLING: The TMR samples are taken and boxed by the farmers 12 hours before the milk sampling.

4. SAMPLE DELIVERY TO THE LAB AND RECEIVING BY THE LAB: sampling boxes (both for milking and for the forage) are posted by the technicians to the lab.
Sample analyses by the Milk and Feed Laboratories

The arrived TMR samples are analyzed (by NIR-technology) in our Feed Laboratory for:

- Dry matter content,
- Crude protein,
- Crude fibre,
- Crude fat,
- Crude ash,
- Starch,
- Sugar,
- NDF, ADF, ADL,
- NFC, NSC,
- NEI, OMd, DOM, FOM,
- NDFd and dNDF,
- pH, nitrate.
Sample analyses by the Milk and Feed Laboratories

The milk samples are routinely analyzed in our Milk Testing Laboratory (using FTIR method):

fat, protein, lactose

milk urea (FTIR), somatic cells (Flow Cytometry Method) are analyzed in the monitoring system automatically as well.

<table>
<thead>
<tr>
<th>Parameter of measurement</th>
<th>Range of measurement</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>fat</td>
<td>1,5-5,8 g/100g</td>
<td>g/100 g</td>
</tr>
<tr>
<td>protein</td>
<td>2,0-5,0 g/100g</td>
<td>g/100 g</td>
</tr>
<tr>
<td>lactose</td>
<td>4,0-5,5 g/100g</td>
<td>g/100 g</td>
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<tr>
<td>somatic cells</td>
<td>100-900,000 cells/cm3</td>
<td>x103 db/cm3</td>
</tr>
<tr>
<td>urea</td>
<td>0,010-0,060 g/100 g</td>
<td>g/100 g</td>
</tr>
</tbody>
</table>
Material and methods

Opportunity to measure the minerals from the TMRs:

1. **M4 package**: Ca, P, K, Na, Mg, S, Cl, DCAD (can be calculated)

2. **M5 package**: M4 + Cu, Zn, Mn
MONTHLY TMR report (good sample)

Dry matter intake enough to meet the requirements (kg/cow/day)

<table>
<thead>
<tr>
<th></th>
<th>5</th>
<th>10</th>
<th>15</th>
<th>20</th>
<th>25</th>
<th>30</th>
<th>35</th>
<th>40</th>
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</thead>
<tbody>
<tr>
<td>Optimum (680 kg)</td>
<td>30.0</td>
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<td>NEI</td>
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<td>Crude protein</td>
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<td>NDF min. (16% forage NDF)</td>
<td>28.4</td>
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<tr>
<td>NDF min. (17% forage NDF)</td>
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<tr>
<td>NDF min. (18% forage NDF)</td>
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<tr>
<td>dNDF min.</td>
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<tr>
<td>NFC max. (16% forage NDF)</td>
<td>32.2</td>
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<td>NFC max. (17% forage NDF)</td>
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<td>Starch min. (fotom.)</td>
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<td>Starch max. (fotom.)</td>
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<tr>
<td>Total sugar min.</td>
<td>18.2</td>
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<tr>
<td>Total sugar max.</td>
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<td>27.3</td>
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</tbody>
</table>

One of the best farm in Hungary:
12,500kg milk/305 days
April 2014.

Crude protein g/kg DM 176
Crude fiber g/kg DM 153
Sugar g/kg DM 66
Starch g/kg DM 198
NDF g/kg DM 289
ADF g/kg DM 177
NFC g/kg DM 398
dNDF g/kg DM 172

TMR sampling: monthly, 12 hours before milk sampling
2014: 130 farms, 50,000 cows/month, 20,000 TMR data
MONTHLY TMR report (bad sample)

Dry matter intake enough to meet the requirements (kg/cow/day)

- **Crude protein** g/kg DM | 164
- **Crude fiber** g/kg DM | 181
- **Sugar** g/kg DM | 28
- **Starch** g/kg DM | 202
- **NDF** g/kg DM | 358
- **ADF** g/kg DM | 238
- **NFC** g/kg DM | 342
- **dNDF** g/kg DM | 151

- **low milk fat** (lignified fiber)
- **high milk urea conc.**
- **ketosis risk (NDF)**

TMR sampling: monthly, 12 hours before milk sampling
One of the best farms in Hungary:
12,500kg milk/305 days
130 farms, 50,000 cows/month, 20,000 TMR data

April 2014.

MONTHLY MILK REPORT

<table>
<thead>
<tr>
<th>Month</th>
<th>Farm</th>
<th>Milk Production</th>
<th>Average Daily Milk</th>
</tr>
</thead>
<tbody>
<tr>
<td>April</td>
<td>Farm A</td>
<td>12,500kg</td>
<td>41.5kg</td>
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<tr>
<td></td>
<td>Farm B</td>
<td>11,500kg</td>
<td>39.5kg</td>
</tr>
</tbody>
</table>

2014: 130 farms, 50,000 cows/month, 20,000 TMR data
Farm reports based on analytical results prepared by advisors

TIMING: **IN TIME ON FARM**

1. Measured **data** are sent within **48 hours** on electronic way (pdf) to the farm,

2. **Report** with the **figure** is emailed within **72 hours** since sample receiving.

3. The **results of milk samples** are sent within **7 days** from the time of sampling, by e-mail, or by the post. + **MILK REPORT (10 DAYS)**
Farm advisory

- **OUR MILK AND TMR REPORTS:**
  - global view about herds’ performance level, management efficiency and health status in monthly reports.
- It is **useful practical tool** in their hand for **decision making**.
- **Personal advisory on the farm by our advisers are available**, also.
Thank you for your attention!