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

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The Milk Testing Laboratory (FTIR and FCM) and the Feed Laboratory (NIR) at the LPT Ltd. in Hungary are involved in a countrywide monitoring system based on TMR- and milk sample analyses. The new system was introduced in 2014 with contribution of 130 farms. The aim was to evaluate the actual nutritive value of the high milking dairy cow diet having potential effect on milk production, milk composition and animal health. Correlations between the milk and the TMR results are evaluated monthly. The farm TMR samples are taken 12 hours before the milk samples and analyzed for dry matter content, crude protein, crude fibre, crude fat, starch, crude ash, sugar, NDF, ADF, ADL, NFC, NSC, NEL, OMD, DOM, FOM, NDFd, and dNDF, pH, nitrate by NIR-technology.

The milk samples routinely analyzed for fat, protein, lactose, urea, and somatic cells. Reports of the high milking TMR samples are based on the measured nutrient concentration and the presumable dry matter intake. The reports contain a figure (diagram) showing the required dry matter intake to cover the actual nutrient demand according to the measured nutrient concentration in the TMR and the actual milk yield (milk data given by the milk test).

The difference among the optimal, the real and the required dry matter intake shows the inadequate/adequate nutrient concentration, the presumable effect on milk production and milk composition, animal health risk, moreover the management problem on the farm. Other important practical data about the farms are given to our experts from our technicians. Having analyzed the milk and the TMR samples a complex expert's report is being created to our customers.

Keywords: milk-recording, diet, monitoring system, coordination.

The unified and regular milk recording of dairy cattle population was established in 1910 and actively serves dairy farmers during the last 105 years in Hungary. The system and methods of regular milk recording are presently organized and made by the Livestock Performance Testing Ltd (LPT Ltd). 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.

Approximately 178 thousand dairy cows (85% of the Hungarian population) were recorded in 2014. These cows were held in 461 farms, so the average number of recorded dairy cows per a farm was 387 in the last year.

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. By now, 250 farms have contracts, and close to 49,5% of

Abstract

Introduction

the recorded cows are concerned in this monitoring system. The aim was to evaluate the actual nutritive value of the high milking dairy cow diet having potential effect on milk production, milk composition and animal health (SARA risk assessment - prognosis).

Material and methods

Sample making and receiving by the milk and feed laboratories

Since the milk-recording in Hungary is mainly supervised (more than 90% is performed by the method A), the sampling technicians and their managers have an important role in the coordination of this monitoring system. The demand of the sampling boxes is indicated by the managers of the sampling technicians to the head of the laboratories. According to a prepared integrated list, the sampling boxes (both for milking and for the forage) are posted to the farms. The TMR samples are taken and boxed by the farmers 12 hours before the milk sampling, then all samples (milk and TMR) are sent by the technician together, but in separate boxes to the LPT Ltd.

Sample analyses by the milk and feed laboratories

The arrived TMR samples are analyzed in our Feed Laboratory for dry matter content, crude protein, crude fibre, crude fat, starch, crude ash, sugar, NDF, ADF, ADL, NFC, NSC, NEL, OMD, DOM, FOM, NDFd, and dNDF, pH, nitrate by NIR-technology. The milk samples are routinely analyzed in our Milk Laboratory using FTIR method for fat, protein, lactose in the frame of the Milk-recording system. Milk urea (FTIR), and somatic cells (Flow cytometry method) are analyzed in the monitoring system automatically as well.

There is an opportunity to measure the minerals from the TMRs in severe packages. M4 package includes Ca, P, K, Na, Mg, S, and Cl, so DCAD can be calculated. M5 package includes the composition of M4, and moreover Cu, Zn, Mn as well. Farm reports based on analytical results prepared by advisors Reports of the high milking TMR samples are based on the measured nutrient concentration and the presumable dry matter intake. The reports contain a figure (diagram) showing the required dry matter intake to cover the

Table 1. The measured parameters in the Milk Laboratory of LPT Ltd.

Parameter of measurement	Range of measurement	Unit
Fat	1,5-5,8 g/100g	g/100 g
Protein	2,0-5,0 g/100g	g/100 g
Lactose	4,0-5,5 g/100g	g/100 g
Somatic cells	100-900.000 cells/cm3	x103 cells/cm3
Urea	0,010-0,060	g/100 g

actual nutrient requirement according to the measured nutrient concentration in the TMR and the actual milk yield (actual milk data are derived from the milk recording database). The difference among the optimal, the real and the required dry matter intake shows the inadequate/adequate nutrient concentration, the presumable effect on milk production and milk composition, animal health risk, moreover the management problem on the farm. The parameters are showed on a diagram, and values are indicated too. The blue color shows the adequate supply, the green-lineal column shows nutrient deficiency, the redspotted ones overfeeding in intensive Holstein herds.

Measured data are sent within 48 hours on electronic way (pdf) to the farm, report with the figure is emailed within 72 hours since sample receiving. The results of milk samples are sent within 7 days from the time of sampling, by e-mail, or by the post.

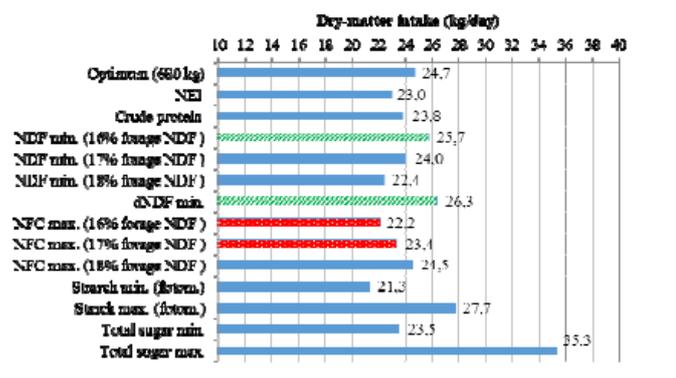


Figure 2. The nutrient supply based on the TMR measured nutrient concentration and presumable drymatter intake (NRC 2001 recommendation). The supposed milk-production of the group fed by the analysed TMR: 40 kg milk/day/cow.

Several important practical data are delivered to our advisers by the technicians about the farms. Having analyzed the milk and the TMR samples a complex monitoring report is being created for our customers. This final report is sent within 10 days after the sample receiving. As participant of the farm monitoring system, customers can get a global view about their farms month by month- with details of the herds' performance level, management efficiency and health status changes - as a useful practical tool in their hand for decision making.

Farm advisory