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ECONOMIC ASPECTS OF LACTO-CORDER UTILIZATION FOR IMPROVEMENT OF LACTATING COWS' PRODUCTIVITY CONTROL

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INTRODUCTION

Costs related to the control of lactating cows and milk sampling are quite high, but obtained data and their accuracy are not satisfactory. Consequently, results of selection assessment of bulls' fathers and mothers are not complete (Sprengel et al., 2001). Costs of milk productivity control are mostly covered by producers themselves, which directly affects their financial profit. As a solution for such situation, Bavarian authorities in cooperation with scientific institutes started using a new measuring device called Lacto-Corder (Dodenhoff et al., 1999; Dodenhoff et al., 2000). This device is more efficient in assessing cows' productivity, lactating ability and udder health, and is also used for milk sampling (Worstorff, 1993). Lacto-Corder as a measurement device is recognized by the International Committee for Animal Recording (ICAR). The device is composed of two parts, one being hydraulic and the other electronic. Hydraulic part regulates milk flow through the measuring area, which further consists of 60 separate electrodes that measure milk flow each 0.7 seconds. Electronic part refers to operational area for data collection and storage (including keyboard and display). Advantage of milking with Lacto-Corder is a direct isolation of milk sample into coded bottle, which is further analyzed. It is relatively light (app. 2.3 kg) and small in size and adjusted to conditions of milking site, thus making measurement procedures easier. It is equipped with rechargeable battery lasting for 16 hours. Additional equipment of Lacto-Corder is: printer, diskettes, diskette reader and laptop. The aim of this paper is to introduce scientific and professional audience with advantages of Lacto-Corder and its potential users.

MATERIAL AND METHODS

The research was carried out on cows of the Holstein breed (n = 457), which were in the first to sixth lactation periods. There were 13 production parameters monitored, and for the purpose of this research only eight were elaborated, as follows:

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- tS500 = milking duration from the beginning to initiation of milk flow 0.5 kg/min (min),
- tUFM = duration of stimulation phase (min),
- tPFM = duration of peak phase (min),
- tSFM = duration of blind phase (min),
- tGFM = duration of the main milking phase (sum of stimulation, peak and blind phases),
- PMGM = milk flow in the main milking phase (kg/min),
- MPM = maximum milk flow (kg/min),
- KMM = milk yield (from the beginning to the end of milking) (kg).

Milk productivity is measured on five dairy farms in Eastern Croatia. Alfa-Laval milking devices were used at a milking site of 2x10 places, which were adjusted before measuring to the pressure value of 50 kPa, pulsation value 70:30 and tact number 60. Udders were washed in warm water and dried before milking.

RESULTS AND DISCUSSION

Research results are presented in Tables 1 and 2.

Duration of the main milking phase (tGFM) was 4.51 min, during which the average milk yield (KMM) was 10.18 kg, and average milk flow per minute (PMGM) 2.27 kg/min (Table 1 and 2). By reducing duration of blind phase in favor of peak phase, udder quarters could be equalized. This would make milking shorter and milk flow and yield per quarters more equal. Peak phase should last for 4–4.5 minutes, while blind phase should be shorter than one minute (Göft et al., 1994; Mijić et al., 2003).

Table 1 Duration of the main milking phase (in minute) of the Holstein cows in all lactations (n = 457)

Lactation	$\bar{x}$	sd	min	max
tS500	0.21	0.23	0.01	4.29
tUFM	0.75	0.55	0.04	4.48
tPFM	1.67	1.36	0.05	9.99
tSFM	2.14	1.27	0.05	10.97
tGFM	4.51	1.88	0.61	19.37

Table 2 Average values of milk flow in the main milking phase (PMGM), maximum milk flow (MPM) and milk yield per one milking (KMM) for all lactations of the Holstein cows (n = 457)

Breed: Holstein-Frisian	$\bar{x}$	sd	min	max
PMGM	2.27	0.79	0.59	5.48
MPM	3.49	1.27	0.89	10.51
KMM	10.18	3.66	5.00	20.14

APPLICATION IN CROATIA

Lacto-Corder could be applied in Croatia. Croatian Animal Centre is recognized as a main user. Information gained through such device related to milk productivity control and milk sampling would be more accurate; human influence on gained results would be almost eliminated, and milk sample would be representative without interrupting microbiological safety. All these data would contribute to gaining more information on each animal, and selection assessment of bulls' fathers and mothers would be more correct. This would provide scientific institution with far more data for processing and analysis, and agricultural advisory service could advise producers on possible errors in milking processes and milking devices.

Price of Lacto-Corder is quite high (app. 7. 000 €), however, it is possible to get a discount if purchasing more devices. Taking into consideration its efficiency, invested means would pay off quickly. For example, yearly costs of lactation per one cow on a Bavarian farm with 30 cows are 38.5 EUR (by the ATM method). This refers to 10 controls during lactation and complete analysis of milk samples (Annual report of LQRB, 1999). According to data obtained from available literature (Caput, 1996), in Croatia, price of lactation control, being understood as measuring the amount of milk and taking milk samples for analysis amounts to 172 kg a year per cow. If calculated in EUR, the price is around 42 EUR, plus the price of laboratory analysis of milk samples.

CONCLUSION

Utilization of the Lacto-Corder device in Croatia in everyday control of lactating cows' productivity would be justified. If following Bavarian example, milk control costs would be lowered, which would positively affect financial benefit of milk producers. As the biggest potential users of this device there are Croatian Animal

Centre, agricultural advisory service and scientific institutions. Lacto-Corder would provide accurate information on productivity, milking and health traits of each animal. Due to relatively high price of the equipment, it is suggested that only several devices are bought in the beginning and used in assessing bulls' fathers and mothers. Wider application should be enabled over the years to come, which would depend on financial means. Although investments in purchasing Lacto-Corder are high, it would become profitable in a short time as it is useful in providing much information. The Faculty of Agriculture of the University of Osijek carries out research into Lacto-Corder utilization with the aim to study milking traits and their correlation with health of cows' udders.

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