

EFFICIENCY OF DAIRY CATTLE NUTRITION MANAGEMENT PROGRAM ON LARGE DAIRY FARMS

DJELOTVORNOST PROGRAMA UPRAVLJANJA HRANIDBOM MLIJEČNOG GOVEDA NA VELIKIM MLIJEČNIM FARMAMA

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SUMMARY

Dairy cattle nutrition management program based on a continuous grazing system combined with efficient grass and maize ensiling methods was developed from 1987 to 1995 for large dairy herds (213 to 420 high producing dairy cows per unit) in Slovenia. Herd management includes a flat rate feeding method, management programs for optimal fertility and herd health service. In the 8 years period higher average milk yield per cow (5822 kg: 7100 kg), lower concentrate feeding per kg of milk (0.269 kg : 0.191 kg) and higher milk production from forage per cow (2690 kg : 4387 kg) were obtained.

INTRODUCTION

A continuous grazing system allows unrestricted grazing on an entire area throughout the grazing season, whereas a rotational grazing system utilises intermittent grazing on a rotational basis. Comparisons and surveys have shown that, in terms of milk production, there is little difference between rotational and continuous grazing systems (LeDu and Hutchinson, 1988). However, a planned grazing system is essential for efficient grassland utilisation, the choice of system being determined by farm circumstances. Grazing management should attempt to balance heritage growth with animal requirements. The integration of conservation with grazing is a valuable management tool for continuously grazing cattle (Illius, Lowman and Hunter, 1987). As larger numbers of cattle are concentrated on a farm and as milk production per

cow increases, pasture management is likely to become more difficult.

In the last ten years specific dairy cattle nutrition management program was developed and tested on different large dairy farms (Orešnik, 1992, 1993) and also on small private farms in Slovenia (Orešnik, 1995). All the results demonstrated positive effects of higher forage quantities in relation to milk yield, milk composition, fertility of cows and herd health status with consequent economic benefits in milk production.

The object of this study was to develop a continuous grazing system integrated with efficient grass ensiling methods and feeding strategies for large, high producing dairy herds (200-400 cows per farm: 6000 - 7000 kg of milk per lactation) in Slovenian conditions.

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MATERIALS AND METHODS

The study was carried out from 1987-1995 on 4 dairy farms in Slovenia with a total of 1321 Friesian cows and herd size varying from 213-420 dairy cows per farm.

Pasture management: Herds were divided into 2-3 groups, each group grazing on a separate pasture area. Sward height was measured twice weekly by the MMB rising plate meter and stocking rate was adjusted to the grass available. The non

grazed areas were used for cutting and rotated with the grazed areas. Fertiliser was applied in the growing season at the rate of 1.0-2.0 kg N day⁻¹ ha⁻¹ every 21 days.

Feeding strategy: Flat-rate feeding (Jackson, 1987) with regular feed quality control and ration calculation. In the late summer and autumn season a grass or maize silage buffer was fed at the rate of 2.0-8.0 kg of DM. In winter season hay, grass silage and maize silage were the basic feedstuffs in the ration.

Table 1. Herd size, milk yield and forage milk production of four different farms

Tablica 1. Veličina stada, proizvodnja mlijeka i proizvodnja mlijeka od krme na četiri razne farme

Farm code Šifra farme	Herd size No of cows Veličina stada - Broj krava		Average milk yield kg Prosječna proizvodnja mlijeka, kg		Average concentrate quantity per kg of milk - kg Pros. količina koncentrata na kg mlijeka, kg		Average milk yield per cow from forage - kg Pros. proizvodnja mlijeka po kravi od krme, kg	
	1987	1995	1987	1995	1987	1995	1987	1995
C.	288	224	5874	7113	0.271	0.181	2690	4538
L.	400	319	5582	7004	0.264	0.181	2635	4472
K.	213	200	5949	7098	0.271	0.203	2724	4220
M.	420	390	5949	7185	0.271	0.200	2724	4317
X.	1321	1133	5822	7100	0.269	0.191	2690	4387

RESULTS

The basic guidelines for efficient grass utilisation on large farms are: adjustment of stocking rate to the grass growth rate (10-12 cows per ha in April and May, 6-8 in June and July, 2.5-3.5 in September and October), regular sward height measurement and maintenance to a 7-10 cm level, regular nitrogen fertilising (1.5-2.0 kg of N ha⁻¹ day⁻¹), correct cutting strategy, efficient ensiling methods, analyses of grass, hay and silage quality and intake, and buffer feeding of silage in late summer and autumn.

Concentrate use (quantity and composition) was regularly adapted to nutritive value of forage and established feed consumption ability of cows.

During the last eight years average milk yield per cow on four treated farms increased by 22.00% (+1278 kg), the quantity of concentrate fed per kg

of milk was by 29.00 % lower (-0.078 kg) and milk produced from roughage per cow by 63.0% (+1697 kg) higher.

Table 2. Average milk fat and milk protein concentrations in 1987 and 1995

Tablica 2. Prosječne koncentracije mliječne masti i bjelančevina u 1987. i 1995.

Farm code Šifra farme	Milk fat Mliječna mast		Milk protein Mliječne bjelančevine	
	1987	1995	1987	1995
C.	3.72	3.96	3.20	3.17
L.	3.69	3.86	3.15	3.20
K.	3.72	3.93	3.30	3.19
M.	3.69	3.83	3.22	3.19
X.	3.70	3.91	3.22	3.18

Logical consequence of higher forage proportion in the ration was higher milk fat content in 1995 in comparison to 1987.

CONCLUSIONS

The nutrition management program based on low concentrate - high forage feeding integrated with efficient continuous grazing system and efficient grass conservation methods improve the forage utilisation efficiency, milk yield and milk fat content in dairy cows. From the results obtained economic benefits in milk production can be calculated. Higher milk yield (+1278 kg per cow), higher milk fat content (+0.21 % = higher milk price) and saving of 627455 kg of concentrate in 1995 in comparison to 1987 are the fundamental starting-point for these calculations.

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SAŽETAK

Program upravljanja hranidbom mliječnih goveda koji se osniva na sustavu neprekidne ispaše u kombinaciji s djelotvornim metodama siliranja trave i kukuruza razvio se od 1987. do 1995. g. za velika mliječna stada (213 do 420 visoko proizvodnih mliječnih krava po proizvodnoj jedinici) u Sloveniji. Upravljanje stadom uključuje jednoličan postupak hranjenja, programe upravljanja za najbolju plodnost i zdravstvene zahvate. U razdoblju od 8 godina postignuta je viša prosječna proizvodnja mlijeka po kravi (5822 kg: 7100 kg), niži utrošak koncentrata po kg mlijeka (0.269 kg: 0.191 kg) i viša proizvodnja mlijeka od krme po kravi (2690 kg: 2387 kg).

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