The Grazemore Decision Support System to Optimise Utilisation of Grazed Grass in Dairy Production

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Introduction Grazing systems are complex and requires good management to obtain a balance between high animal production and efficient utilisation of the grass. The Grazemore Decision Support System (DSS) is a management tool to increase the utilisation of grazed grass in European dairy production (Hetta et al., 2005). The system enables simulations of the effects of different grazing strategies and climates on milk production and grass growth. The aim of this study was to evaluate if the DSS is able to provide a schedule for rotation grazing of high yielding dairy cows with high utilisation of grazed grass in the north of Scandinavia.

Material and methods To evaluate Grazemore DSS ability to design a grazing schedule by user defined grazing rules, a grazing experiment was performed during the summer 2005 at the Forage Research Centre, Umeå, Sweden (63°45′ N; 20°17′E; 12 m elevation). The experiment run for six weeks and included forty dairy cows of the Swedish Red and White breed. The herd was rotating between four paddocks with a total area of 11.9 ha. The pastures consisted mainly of timothy (*Phleum pratense* L.) and meadow fescue (*Festuca pratense* L.). The average supplementary feeding was 2 kg hay and 9 kg concentrate/cow/day. During the experiment, the actual milk yield was recorded twice a week and grass samples were cut once a week to estimate the herbage mass.

Prior to the experiment simulations with the software were run to get a grazing schedule, called Grazing calendar 1, which allocated the herd to the different paddocks. Due to practical conditions the grazing calendar 1 was updated during the experiment, which resulted in the Grazing calendar 2. The difference between actual and predicted milk yield were analysed statistically with a regression analysis and the mean square prediction error (MSPE) was estimated.

Results and discussion Comparisons between the actual milk yield and the milk yield predicted by the Grazemore DSS (Table 1) show that the model had a low prediction error of 5 and 6 percent respectively. Both the milk yield observed and the ability of the DSS to predict this value were satisfactory. The herbage mass during the experiment was higher than predicted by the model resulting in a surplus of grass in the paddocks that was not utilised. The herbage growth model in the Grazemore DSS and its ability to predict the herbage mass could be improved to provide a schedule that gives a higher utilisation of grazed grass.

Table 1 *Mean values of actual milk yield (A) and milk yield predicted by the Grazemore DSS (P) in suggested Grazing calendar 1 and performed Grazing calendar 2*

Calendar	n	Milk yield (kg/cow/day)			R^2	MSPE	MPE	Part of MSPE		
		A	P	Bias				Bias	Line	Random
1	13	29.9	30.8	-0.9	0.25	2.1	0.05	0.38	0.00	0.62
2	13	29.9	31.5	-1.6	0.40	3.7	0.06	0.71	0.01	0.28

n=Number of observations, MSPE=Mean square prediction error, MPE=Mean prediction error

Conclusion Grazemore DSS has a good ability to predict milk yield and has potential to be a helpful tool for optimising grass utilisation in dairy production.

Reference

Hetta, M., Norrsken-Eriksson, M., Persson, S., Larsson, E., Karlsson, L., Alvarez-Torre, N., Eriksson H. & Martinsson, K. (2005). The Grazemore decision support system for grazing management of dairy cows. *The XX International Grassland Congress:* Offered papers, p. 907.