

**EFFECT OF FARM SIZE, SEASON AND STAGE OF LACTATION ON MILK
UREA CONCENTRATION IN SIMMENTAL COWS**

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Abstract: Urea as metabolic product in cow milk is a result of digestion of nitrogen component in the food. Milk urea concentration is a reliable indicator of protein-energy balance in dairy cows and it is affected by nutritional and some non-nutritional factors. The aim of this research was to determine the effect of farm size, season, and stage of lactation on concentration of urea, as well as its association with daily milk yield, milk fat and protein content. For that purpose, 6.364 test-day records were collected for Simmental dairy cows from eight dairy farms during five years. Milk urea concentration and milk chemical composition were determined by infra-red spectrophotometric method by MilkoScan FT6000 and MilkoScan 4400. Smaller farms had significantly lower concentration of milk urea (15.87 mg/dL) compared to larger dairy farms (22.98 mg/dL; $P < 0.01$). The concentration of milk urea produced during the autumn and the winter (18.69 mg/dL; 18.27 mg/dL) was significantly lower than those produced during the spring and the summer (23.53 mg/dL; 24.39 mg/dL; $P < 0.01$). Also, milk urea concentration produced in the 11th and 12th month of lactation (23.09 mg/dL; 23.44 mg/dL) was significantly higher compared to earlier months of lactation ($P < 0.01$). The lowest concentration of milk urea was recorded in the first and second month of lactation (19.74 mg/dL; 19.26 mg/dL) when the daily milk production was the highest. There was a significant correlation between the concentration of milk urea and the level of daily milk production (0.139; $P < 0.01$) and protein content (0.110; $P < 0.01$), while the correlation between the content of milk urea and milk fat was not significant. Considering the indicator of concentration of milk urea in the total sample, only 26.59% cows consumed a balanced meal in terms of proteins and energy content. Based on the study it can be concluded that the farmsize, season and stage of lactation have a significant effect on the milk urea concentration what can be partly explained with indirect influence of the feeding management of dairy cows. These results may be useful for improving the accuracy of models for controlling protein-energy balance in feeding of Simmental cows on dairy farms.

Keywords: urea, milk, dairy cows, Simmental

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