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Maize silage as an energy supplement in organic dairy cow rations

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Abstract

The literature implicates strongly that including energy supplements in dairy rations based on protein-rich forages increases performance and feed efficiency due to an improved and more balanced ruminal energy and protein supply. Therefore, both conventional and organic dairy farms primarily supplement roughages with concentrates, containing high proportions of cereal grains. However, considering the main principles of sustainable agricultural systems and nutrient cycles, the question of alternatives is raised. Therefore, the present study was conducted to compare grain and maize silage as energy sources in organic dairy cow rations. Two grass-clover silage based diets, offered on an ad libitum basis, were supplemented either with 1 kg grain mixture plus 0.5 kg hay (treatment group G) or 2.1 kg maize silage (treatment group M) on a dry matter (DM) basis. The trial was carried out as a change-over design and lasted for 15 weeks. Intake of concentrates, DM, and utilizable crude protein in the duodenum (uCP) were similar in both treatments. However, significant differences between treatment G and M were found for grass-clover silage DMI (13.4 vs. 12.9 kg), forage DMI (14.6 vs. 15.7 kg), crude protein (CP) intake (2885 vs. 2801 g), ruminal nitrogen balance (RNB) (40 vs. 29 g), and intake of neutral detergent fiber (NDF) (7630 vs. 7900 g). Milk yield was not affected by treatment, but in treatment M, milk fat content was at 42.4 g kg⁻¹ significantly higher and milk urea concentration at 19.7 mg 100ml⁻¹ significantly lower as compared to treatment G. Efficiency of N use (N in milk in % of N intake) tended to be improved in treatment M. Balances of energy and uCP (intake as a percentage of requirements) were unaffected by treatment.