Effect of feeding hay vs. silages of various types to dairy cows on feed intake, milk composition and coagulation properties

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Abstract

This Research Paper addresses the hypotheses (1) that milk produced from hay-fed cows differs from that of silage-fed cows and (2) that silage type has an important impact, too. Four diets differing in forage type but with equal estimated milk production potential and a forage:concentrate ratio of 0.85:0.15 were compared regarding their effect on feed intake, milk yield and milk properties. The forages tested were hay, grass silage, conventional short-chopped and long-chopped maize silage subjected to a novel processing technology (Shredlage®). Twenty-four dairy cows were fed two of the four diets in two subsequent runs in an incomplete (4 × 2) Latin-square design (n = 12 per diet). Each experimental period lasted 22 days, with 12 days of adaptation and 10 days of sampling. During sampling, feed intake and milk yield were recorded daily, milk composition and coagulation properties were determined four times. The composition of the diet ingredients was analysed weekly. Data were analysed with a mixed model considering feed, period and their interaction as fixed effects. Stage of lactation, milk yield and milk composition from the pre-experimental period were used as covariates in the model. Dry matter intake was lower with the long-chopped processed maize silage compared to the other three groups. There were some diet differences in intakes of net energy for lactation and absorbable protein in the duodenum, but this did not result in changes in milk yield. The milk fat content was higher with the grassland-based diets compared to the maize silage diets. No treatment effect on milk acidity and rennet coagulation properties was observed. In conclusion, there were no indications for specific physico-chemical properties of milk from a hay-based diet, and maize processing technology was not of large effect either. Future investigations should focus on sensory differentiation of the milk produced with different forages.