
**Abstract**

The effects of replacing chopped alfalfa hay with alfalfa silage in a fine barley grain and alfalfa-based total mixed ration (TMR) were evaluated. Diets contained (dry matter basis) 53.0% commercial energy supplement, 10.3% commercial protein supplement, and 9.7% corn silage. Diets varied in inclusion of chopped alfalfa hay and alfalfa silage, and contained either 20.0% chopped alfalfa hay and 7.0% alfalfa silage, 10.0% chopped alfalfa hay and 17.0% alfalfa silage, or 27.0% alfalfa silage. Contents of crude protein, neutral detergent fiber (NDF), acid detergent fiber, and minerals did not differ among diets. Replacing chopped alfalfa hay with alfalfa silage decreased dietary dry matter, and increased dietary soluble protein and physical effective NDF calculated as the proportion of dietary NDF retained by the 8- and 19-mm screens of the Penn State Particle Separator (peNDF/NDF) from 13.3 to 15.6% DM. Replacing chopped alfalfa hay with alfalfa silage did not affect dry matter intake, rumen pH, rumen volatile fatty acids, blood lactate, milk fat, and milk protein percentage, but did decrease blood glucose, tended to increase blood urea, and numerically decreased milk yield and milk protein yield. A wider range in peNDF/NDF and a higher inclusion of corn silage might have resulted in greater differences in rumen fermentation and milk production among diets. The pH of rumen fluid samples collected 4 h after feeding varied from 5.90 to 5.98, and milk fat percentage varied from 2.50 to 2.60% among diets. These values suggest that mild subacute ruminal acidosis was induced by all diets.

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