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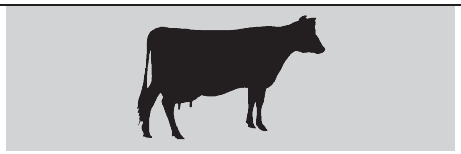

Evaluation of calcareous marine algae supplements on production and metabolic parameters of early lactation dairy cows

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ABSTRACT

Thirty-six lactating Holstein cows were used in a randomized design trial to evaluate the effect of feeding supplemental calcareous marine algae on performance and select metabolic indices of health of Holstein cows in early lactation. Treatments included no supplement (NEG), 204 g/d of sodium bicarbonate (POS), or 87 g/d of calcareous marine algae (AB, Acid Buf, Celtic Sea Minerals). Beginning at 14 ± 4 DIM, all cows were fed NEG for 2 wk before being assigned randomly within parity and calving date to treatment for the following 10 wk. An interaction of treatment and week was observed for DMI, which was lowest during wk 1 and greatest during wk 9 and 10 for POS compared with NEG and AB. No differences were observed for yield of milk, components, or energy-corrected milk. Milk protein percentage tended to be greater for NEG compared with NEG and AB. An interaction of treatment and week was observed for efficiency of milk production (energy-corrected milk/DMI) because efficiency was greatest for POS during wk 1 compared with all other treatments, but was greatest for AB during wk 8 to 10 compared with NEG and POS. Concentrations of MUN were greater for AB compared with NEG, but not different from POS. Serum glucose concentrations were greater for NEG compared with POS and AB. No differences were observed in concentrations of other serum metabolites or enzymes. Supplemental calcareous marine algae supported similar performance but improved efficiency of milk production during the wk 8 to 10 of the trial compared with diets with or without sodium bicarbonate.

Key words: sodium bicarbonate, calcareous marine algae, dietary cation-anion difference, milk yield, milk composition

INTRODUCTION

Calcareous marine algae is produced from *Lithothamniom* spp. and contains (DM basis) 30% Ca, 0.5% P, 6.0% Mg, 0.1% K, and trace minerals that are slowly released in the rumen (**AB**; Acid Buf, Celtic Sea Minerals). Previous research (Calitz, 2009; Mesgaran et al., 2013) suggested the supplement could be used as a buffer in diets fed to lactating dairy cows. When fed at 0.3% of dietary DM, milk yield was increased compared with diets containing 0.125% of buffer (Cruywagen et al., 2004). No additional gains were observed when feeding the buffer at 0.6 or 0.9%. When compared with sodium bicarbonate in high-concentrate diets fed to lactating dairy cows, AB increased ruminal pH compared with the control diet and supported greater yield of milk compared with those fed diets supplemented with or without sodium bicarbonate (Cruywagen et al., 2007).

Dietary buffers are frequently included in diets fed to lactating dairy cows to prevent acidosis and milk fat depression (Enemark, 2008). Erdman (1988) suggested that supplemental buffers were justified when buffer flow from saliva is inadequate and that sodium bicarbonate, magnesium

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