

Eugenol Supplementation In High Or Low Concentrate Diets: Effects On Feed Intake, Nutrient Digestibility, Nitrogen Retention, Milk Production, And Milk Composition Of Dairy Cows.

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Four ruminally primiparous lactating cows (body weight = 568 kg; days in milk = 67) were used in a 4 x 4 Latin square design (28-d periods) with a 2 x 2 factorial arrangements of treatments to determine the effects of eugenol (EUG) supplementation (0 vs. 50 mg/kg of Dry Matter Intake (DMI)) and concentrate level high (H) vs low (L); 65% vs. 35%, Dry Matter (DM) basis) on nutrient digestibility, Nitrogen (N) retention, milk production, and milk composition.

The MIXED procedure of SAS (SAS Inst., Inc., Cary, NC) was used to test the main effects of EUG supplementation, concentrate level (CON) and their interaction (CON x EUG). Significance was declared at $P > 0.05$. No interaction of CONxEUG was observed for any of the variables measured. Intake of DM was higher for H than for L (20.0 vs. 16.9 kg/d). Apparent total tract digestibilities of DM (66.8 vs. 69.4%), Organic Matter (68.2 vs. 70.8%), Nitrogen (N) (66.0 vs. 68.8%), and Acid Detergent Fiber (57.3 vs. 60.6%) were lower for H than for L. Retention of (N) was not affected by concentrate level (59 g/d; 11% of N intake). Milk production (32.2 vs. 30.8 kg/d) and milk protein content (3.31 vs. 3.02%) were higher whereas milk fat content was lower (3.64 vs. 3.92%) and milk lactose concentration tended to be lower (4.67 vs. 4.61; $P = 0.08$) for cows fed H than for those fed L. Milk urea N was unaffected by concentrate level (9.52 mg/dL). Yield of 4% Fat Corrected Milk (FCM) was similar for H and L diets (30.1 kg/d). Yield of milk fat was not affected by concentrate level (1.17 kg/d) whereas milk yields of protein (1.05 vs. 0.93 kg/d) and lactose (1.51 vs. 1.37 kg/d) were higher for cows fed H than for those fed L. Feed efficiency (kg 4% FCM/kg DMI) was lower for cows fed H than for those fed L (1.51 vs. 1.79). Neither DMI nor nutrient apparent total tract digestibility, N retention or milk performance was affected by EUG supplementation.

Implications: Results of this study show that adding EUG at the concentration of 50 mg/kg of dietary DM to a high or low concentrate diet had no effects on nutrient digestibility, N retention, milk production and milk composition of dairy cows.