Hay substitution with a field pea-based blended RDP-RUP compound supplement fed daily or on alternate days to gestating-lactating beef cows

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Abstract

To evaluate a forage mitigation strategy, third trimester beef cows were used to determine the effect on subsequent beef cow performance when 28.1% of forage dry matter (DM) was replaced with a nutrient-dense pelleted rumen degradable protein-rumen undegradable protein supplement (RDP-RUP) fed daily (D) or on alternate days (Alt-D). In the 111 day study, one hundred seven, 3-10 year old beef cows, were randomized to the following treatments: 1) all hay control group (C), 2) hay and straw forage that was reduced 28% and replaced with a field pea-barley malt sprout-distillers dried grain with solubles supplement (PEA-BMS-DDGS) fed D at 0.25% of initial body weight (BW) or, 3) hay and straw forage that was reduced 28% and replaced with a PEA-BMS-DDGS fed on Alt-D at 0.50% of initial BW. Control cows consumed 14.1 kg of hay compared to supplemented cows that consumed 8.10 kg hay, 2.03 kg straw, and 1.37 kg of supplement daily for a total of 11.5 kg. The experimental supplement that was fed supplied 61% RDP and 36% RUP. Reducing hay in the experimental diets and replacing it with wheat straw and the PEA-BMS-DDGS supplement fed either D or on ALT-D did not affect ending cow BW, body condition score, fat thickness, pre-breeding estrous cyclicity, reproductive cycle pregnancy, or the total percent of cows pregnant ($P > 0.10$). Control and Alt-D calf birth weight was heavier than the D supplemented group ($P < 0.01$). Calf weaning weight and gain did not differ ($P > 0.10$). Biologically, there was no difference between C and supplemented cows throughout the study and it was determined that one unit of PEA-BMS-DDGS supplement could replace 2.9 units of forage. On average, and on the basis of 100 cows supplemented for the 111 day period, 15.1 mt of supplement replaced 44.1 mt of forage ($P<0.001$). Compared to feeding the all hay C diet, the cost of replacing hay with wheat straw and the nutrient-dense PEA-BMS-DDGS supplement was $287.54, $304.44, and $302.43 per cow for the C, D, and ALT-D treatments, respectively. The slightly higher cost for supplementation in the drought mitigation strategy tested was miniscule compared to selling cows to fit the available forage supply. These data suggest that adequate nutrient supply to the rumen and small intestine can be obtained when feeding a PEA-BMS-DDGS on ALT-D and that the dietary strategy can be used to mitigate drought related hay shortages.

Key Words: Beef cows, barley malt sprout, distillers dried grain with solubles, field pea, rumen degradable protein, rumen undegradable protein