Kansas Agricultural Experiment Station Research Reports

Volume 0
Issue 1 *Cattleman's Day (1993-2014)*

Article 111

2008

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Recommended Citation

Sproul, N.A.; Bolte, J.W.; Linden, D.R.; Kreikemeier, R.A.; Pacheco, L.A.; Thomas, M.D.; Higgins, James J.; Olson, K. C.; Drouillard, James S.; and Jaeger, John R. (2008) "Behavior of beef cows grazing topographically rugged native range is influenced by mineral delivery system (2008)," *Kansas Agricultural Experiment Station Research Reports*: Vol. 0: Iss. 1. https://doi.org/10.4148/2378-5977.1514

Behavior of beef cows grazing topographically rugged native range is influenced by mineral delivery system (2008)

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BEHAVIOR OF BEEF COWS GRAZING TOPOGRAPHICALLY RUGGED NATIVE RANGE IS INFLUENCED BY MINERAL DELIVERY SYSTEM

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Introduction

Poor grazing distribution is a major problem on rangelands of the western United States. Grazing animals tend to congregate in areas near water, shade, and level terrain. These areas typically become overgrazed, while less preferred areas of pasture remain under-grazed. Solutions to localized overgrazing include cross-fencing and water development; however, most land managers are unwilling to bear the expense associated with these strategies.

Most types of supplements, including mineral supplements, have potential to lure cattle into under-utilized areas of range and pasture. Cows spend up to 40% of their time within 650 yards of self-fed supplements, but relationships between terrain use, mineral supplement delivery method, and mineral supplement consumption remain unclear.

Experimental Procedures

The study was conducted on four pastures (approximately 300 acres each) at the Kansas State University Commercial Cow-Calf Unit. These native range pastures were dominated by Big Bluestem (*Andropogon gerardii*), Indiangrass (*Sorghastrum nutans*), Sideoats grama (*Bouteloua curtipendula*), and Little Bluestem (*Schizachyrium scoparium*). All pastures were characterized by moderately rugged terrain (10 to 20% slopes) and contained a single centrally located surface water source. Each pasture was grazed from February to May 2007 by 60 mature beef cows (average initial body weight (BW) = 1239 ± 84 lb); calving occurred during April and May.

Treatments consisted of a self-fed mineral delivered in either a dry granular form (DRY) or as a low-protein, cooked molasses-based block (BLOCK). Supplemental mineral for DRY was supplied free choice to cattle via a single covered mineral feeder. Block was supplied ad libitum to cattle via open-topped barrels (15 animals per feeder) spaced within 10 yards of one another. Both DRY and BLOCK were deployed in each pasture. Pasture was considered the experimental unit. No additional salt was supplied to cattle.

Forage utilization in the vicinity of each supplement type and the frequency and duration of herd visits to the vicinity of each supplement were measured during four 14-day periods. Supplements were moved to new locations each period. Within each pasture, supplements were placed a minimum of 200 yards apart in locations with similar forage species composition, slope, and distance from water. Above-ground biomass was measured in a circular area (radius = 110 yards) around each supplement site on day 1 and day 14 of

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each period. Grazing exclusion cages were set up at each site to serve as an index of forage availability. Motion-sensitive cameras, programmed to take time- and date-stamped pictures at 5-min intervals, were placed inside the exclusion cages to record the frequency and duration of herd visits to each supplement deployment site. Herd visits to each site were defined as the interval of time between when the first and last pictures were taken. A herd visit was considered complete when the interval between pictures was at least 30 minutes. Mineral disappearance from feeders was considered equivalent to consumption.

Results and Discussion

Forage availability did not limit dry matter intake by cattle at any time during this experiment. Standing forage biomass was 2,466 lbs/acre during February; 2,449 lbs/acre during March; 2,098 lbs/acre during April; and 2,008 lbs/acre during May.

Consumption of BLOCK was greater than DRY during each month of the experiment (Figure 1). Moreover, the magnitude of the difference was affected by month (treatment × period, $P = 0.03$). In general, consumption of both supplement types declined over time as the forage transitioned from winter dormancy to spring growth. Average intakes of BLOCK and DRY during the experiment were 0.42 and 0.13 lbs/cow per day, respectively.

Greater consumption of BLOCK likely stemmed from more frequent herd visits to sites where BLOCK was deployed compared with sites where DRY was deployed (Figure 2; $P<0.02$). Additionally, herd visits to BLOCK sites were longer than those to DRY sites (Figure 3; $P<0.01$). Average duration of herd visits to both supplement types generally decreased as forage conditions improved (cubic effect, $P<0.01$; Figure 4).

There was a weak trend ($P=0.16$) for the total length of nighttime visits (6 p.m. to 6 a.m.) to be greater for BLOCK than DRY (1.12 vs. 0.87 hours/day). Similarly, herds tended ($P=0.15$) to visit BLOCK more often than DRY during the night time hours (56.7 vs. 50.1% of all visits). Other researchers have reported that cattle spend more time around molasses-based supplements at night than other supplement types.

Standing forage biomass around supplement deployment sites was similar for BLOCK and DRY ($P>0.54$) before and after each experimental period. Measurements of forage disappearance during the trial were complicated by rapid forage growth during the last two months of the trial.

Implications

Data suggest that block supplements influence the behavior of grazing cattle to a greater degree than dry mineral supplements. Molasses-based mineral supplements might be more effective than dry, granular mineral supplements at luring grazing cattle into underutilized areas of pasture.

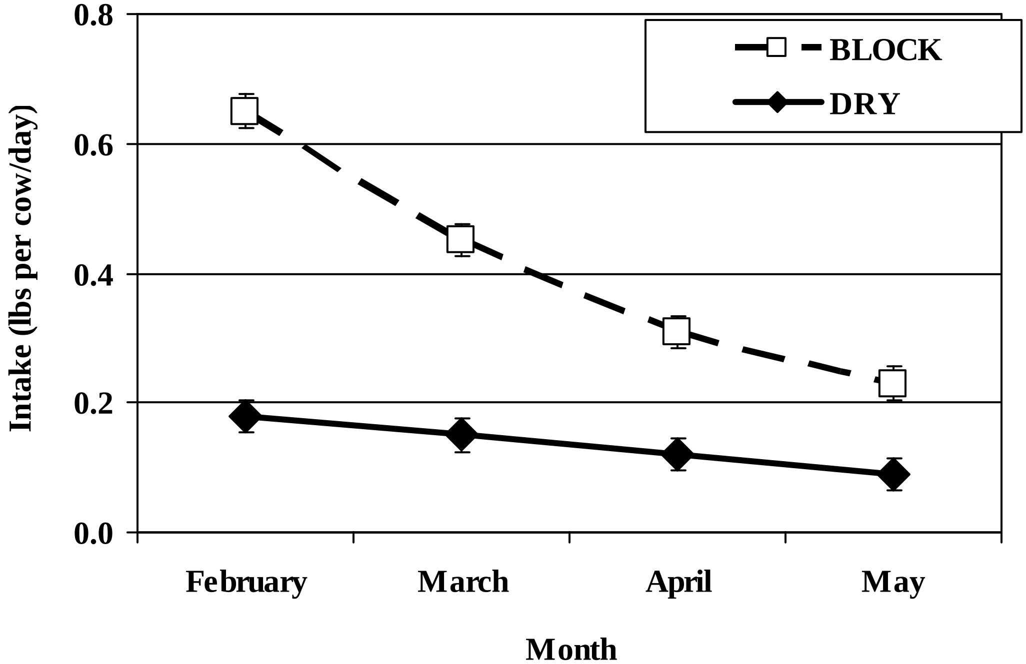

Figure 1. Effect of Mineral Delivery System and Advancing Season on Intake of Mineral Supplements by Cows (treatment × period interaction; P = 0.03).

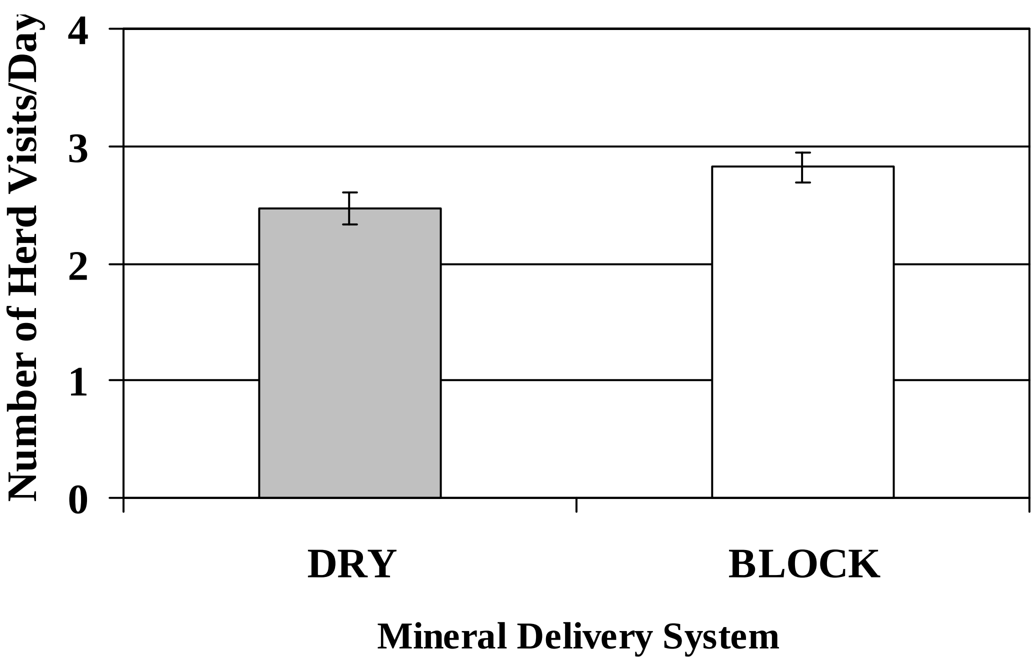

Figure 2. Effect of Mineral Delivery System on the Number Times Beef Cows Visited Supplement Deployment Sites (main effect of treatment; P = 0.02).

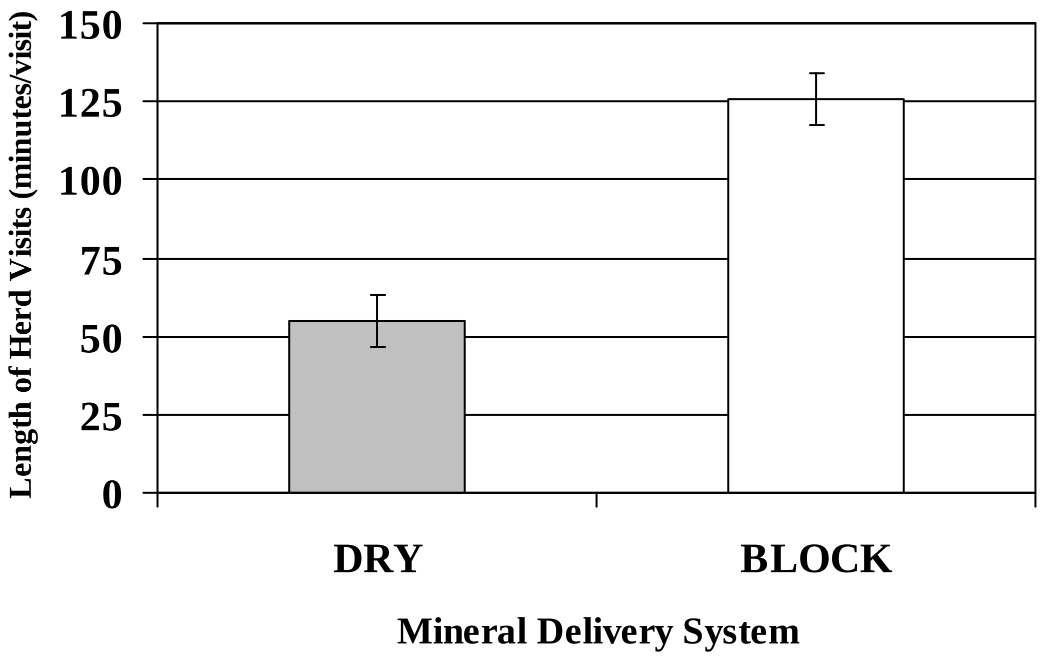

Figure 3. Effect of Mineral Delivery System on the Length of Herd Visits to Supplement Deployment Sites (main effect of treatment; P<0.01).

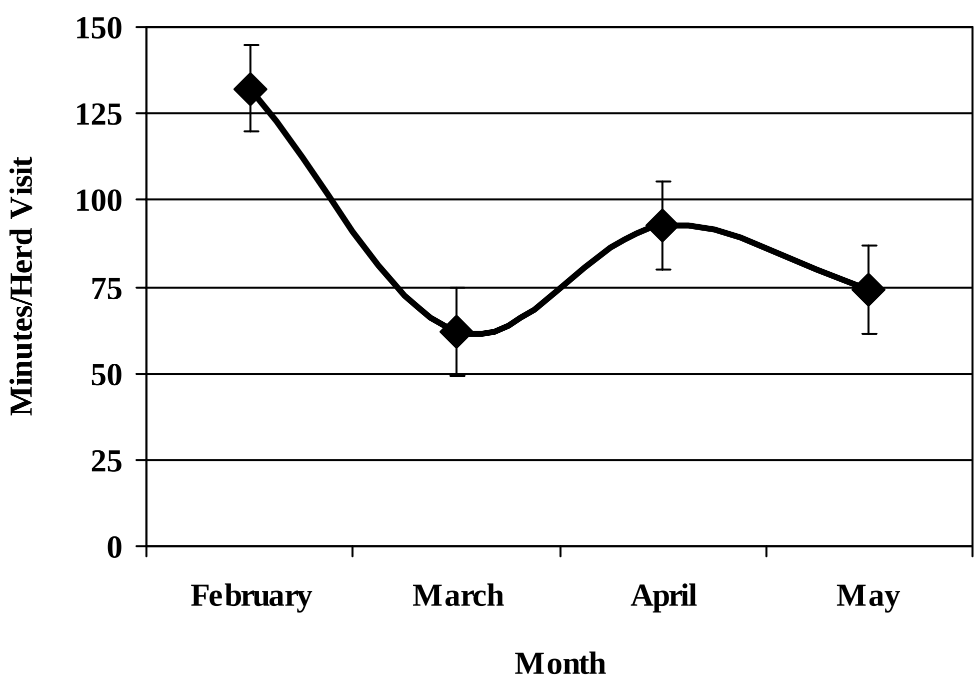

Figure 4. Effect of Advancing Season on the Duration of Herd Visits to All Supplement Deployment Sites (main effect of period; P<0.01).