PRIME CUTS

Does Grazing Season Influence Mineral Supplement Consumption?

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Research Question: Are there differences in mineral consumption between the spring and fall?

The most widely used method of providing supplemental minerals to grazing cattle is through free-choice mineral supplements in the forms of loose minerals, pressed blocks, liquid supplements, and molasses-based tubs. Supplying minerals in the necessary amounts is dependent on the concentration of elements in the supplement and the quantity of supplement consumed. The majority of supplements (loose and block) utilize salt to regulate consumption. Nonetheless, cattle will often consume salt in excess. Intake of free-choice loose mineral supplements is often variable among animals. Research has found that daily loose mineral supplement intake by beef cows can range between 0 and 30 oz/day. Similarly, large individual variability has also been reported for supplements offered either as blocks or liquid. Understanding what influences mineral consumption was the focus of this research which was conducted by Dr. Ricardo Manzano from Brazil who was recently a post-doc with our nutrition group.

Work conducted by Weber et al. (1992) evaluated individual and group average intakes by cows offered either iodized salt, trace mineralized salt, 21% protein or 36% protein blocks. Cows showed the highest individual and group average supplement intake during the months when low forage availability and quality were measured.

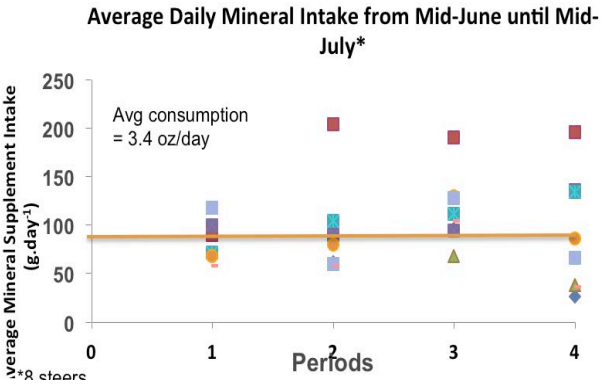
This experiment was aimed at understanding of how changes in forage quality influenced individual consumption of a free-choice, loose mineral supplement when forage availabilities were kept similar between spring and fall grazing seasons.

Two pastures located on the MSU Beef Cattle Research and Teaching Farm were equipped with GrowSafe Feeders (see above photo) which has the ability to measure individual animal mineral consumption, time spent consuming mineral and number of times the supplement was consumed. The mineral supplement contained 26% salt, 11% calcium and 5.5% phosphorus. Each pasture ranged in size from 2.5 to 3.3 ac in size. Forage dry matter availability was maintained above 1700 lbs/acre during both the Spring and Fall grazing seasons. Each pasture was grazed by four steers which had an average initial weight of 575 lbs. The following table shows how forage quality declined over the grazing season but forage availability remained statistically the same.

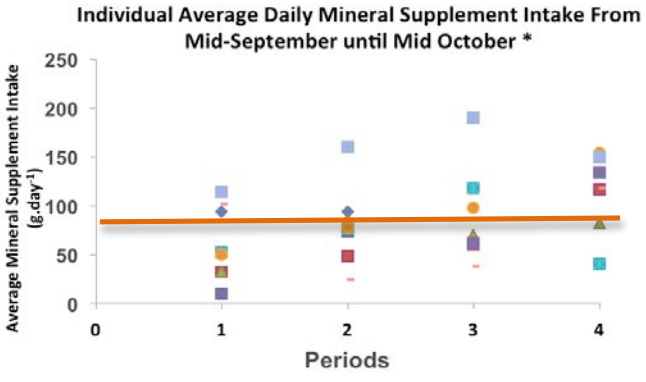
Changes in forage availability, crude protein and digestibility for spring and fall grazing seasons.

Item	Spring/Summer (June-July)	Fall (Sept-Oct)
Dry matter availability, lbs/ac	3490	3223
Avg. crude protein, %	14.6	11.7
Avg. forage digestibility. %	71.1	56.0

When forage availability was kept similar, average mineral supplement consumption was similar between seasons (3.4 vs. 3. oz/day). The variation in mineral consumption is described in the following graphs.



Avg consumption = 3.4 oz/day

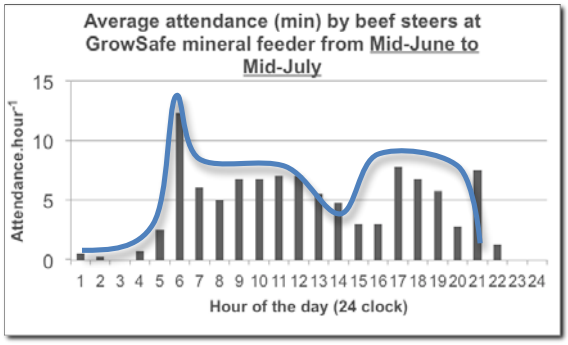


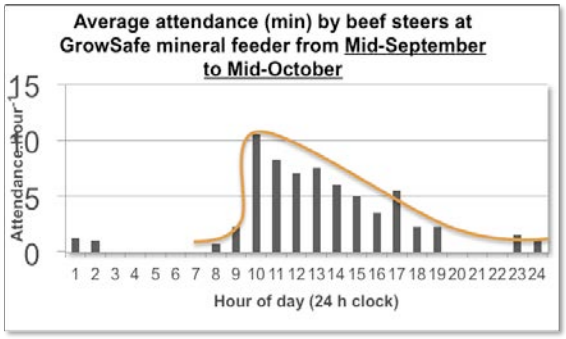
Avg consumption = 3.0 oz/day

Although the average consumptions were similar between both seasons, results do show the variation in mineral consumption within each of the seasons. Each season was split into 4 periods of approximately 9 days each and individual animals are represented by different shaped and colored symbols. The variation in mineral consumption among all animals ranged

between 0 and 14 oz/day during the spring and 0 and 15 oz/day during the fall season. One of the behaviors that we have measured is that there is one day in which there is high mineral consumption followed by several days of little to no consumption. For instance, one of the steers (#6) had a variation in mineral consumption of 0 oz/day to a high of 9.5 oz/day with an average consumption over 36 days of 3.2 oz; just what we expected him to consume. The long-term goal of our research efforts is to reduce (we will never eliminate) this behavioral variation by understanding what causes it.

From a behavior standpoint, the following two graphs show how attendance at the GrowSafe mineral feeders was affected by season of grazing. During the Spring season (more daylight), steers started mineral consumption between 5 and 6 am. However, during the fall (less daylight) consumption didn't start until 9-10 am. Even with these differences, average consumptions were similar between seasons when forage availabilities were kept above 1500 lbs/acre. We have other data to show that differences between seasons would have occurred if forage availability was allowed to drop below this threshold during the fall months.





Summary:

The results of this study show that average mineral consumptions were similar during the spring and fall if forage availabilities were similar even though forage quality was different. A future Prime Cuts will summarize how mineral consumption changed when Fall forage availability was allowed to decline below an optimum threshold.

Questions? Give me a call at 406.994.5562 or email at johnp@montana.edu and we can visit.