

Getting the Most Out of Grain Supplements

Don C. Adams

Inadequate intake of energy from dormant forage is often a problem for range cattle during the last third of pregnancy, early lactation, periods of harsh weather and for growing animals. Supplements are often fed to correct nutrient deficiencies in the diets of range livestock, but the cost must be balanced against returns. Some supplementation strategies are more effective than others. Protein supplements are effective in improving energy balance by increasing intake and digestibility of range forage. Grain supplements often result in lower forage intake and digestibility than when cows consume range forage only. However, feeding grain supplements is appealing because they are generally less expensive than protein rich feedstuffs. If grains are to be a practical alternative to protein supplements, management practices must be identified so that range forages are complemented rather than replaced in the diet or their nutritive value reduced. Changing the interval between and the time of feeding are two potential techniques to optimize the benefits of grain supplements. Both have potential for achieving improved efficiency.

Feeding Daily vs Every Other Day

The efficacy of feeding grain supplements on a daily or alternate day basis was evaluated. Dry pregnant crossbred cows foraging on native rangeland during November, December and January were fed cracked corn at the rate of either 3.3 lb daily or 6.6 lb on alternate days. At the beginning and end of the study, cows were scored for body condition (fatness or thinness) as described by Bellows et al. (1971). Rumen fistulated steers were grazed concurrently with the cows and were supplemented on a daily or alternate-day basis. Samples of rumen fluid were collected for pH (acidity) determinations.

Weather conditions during the study were moderate for the Northern Great Plains. Cows supplemented daily with the corn performed better than those fed on alternate days. Over the 10-week study, cows fed daily gained 142 lb while those fed on alternate days gained 69 lb. Cows fed supplement daily increased in body condition or they gained body tissue, while those fed on alternate days lost a slight amount of body condition from the beginning to the end of the study. In contrast to these data with grain, other studies have demonstrated that a supplement of cottonseed cake can effectively be fed on alternate days, every third day or even weekly without decreasing animal performance compared to a daily feeding schedule (McIlvain and Shoop, 1962; Melton and Riggs, 1964).

Mertens (1979) suggested that a pH between 6.7 and 7.0 is optimum for fiber digestion in the rumen and that pH values

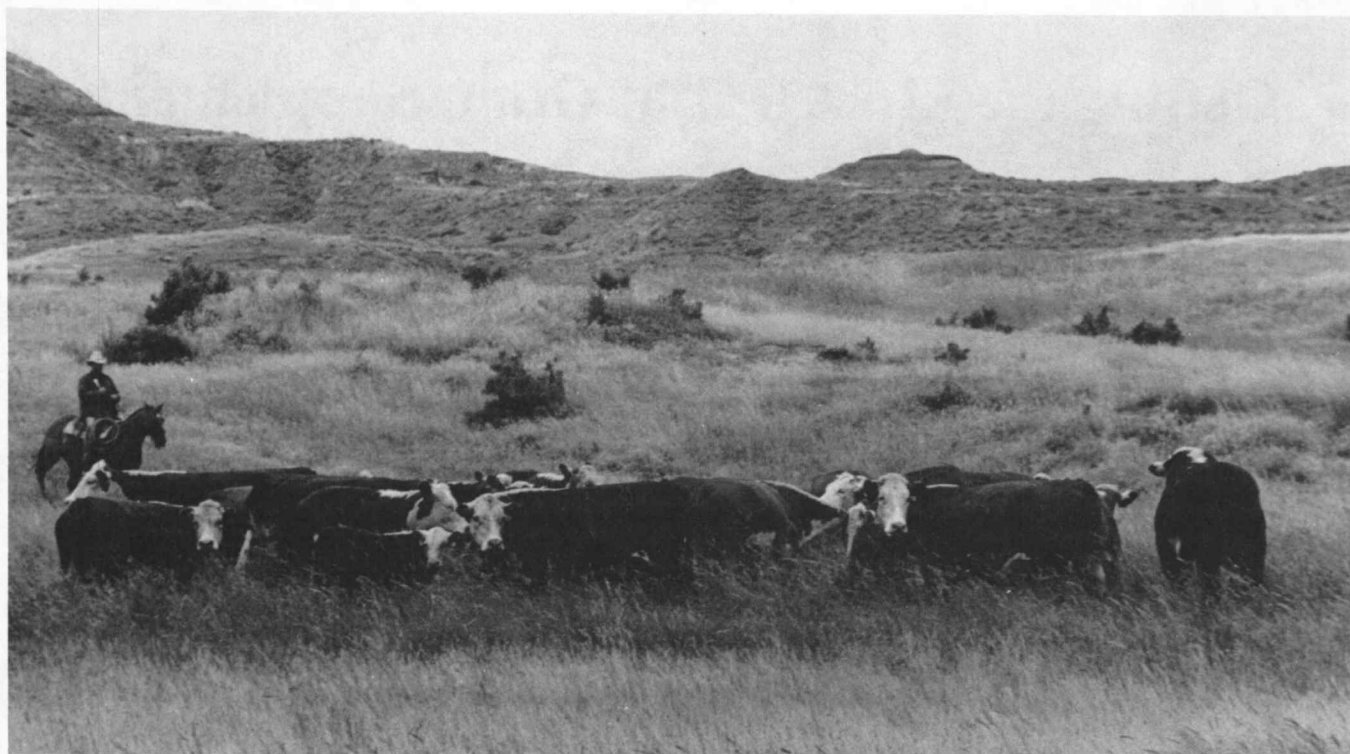
below this optimum can reduce fiber digestion. In this study, rumen pH of steers supplemented on a daily basis was closer to the optimum described by Mertens (1979) than was the pH for steers supplemented on alternate days. Differences in pH between steers supplemented daily and those supplemented on alternate days were sufficiently large to indicate that alternate-day feeding may have adversely affected fiber digestion. This difference in potential fiber digestion may account for the difference in the rate of gain of cows from the two treatments.

Time of Supplementation

Rationale for the time of supplementation was based on livestock grazing patterns. Traditional morning supplementation often falls during a major grazing period and would therefore disrupt normal grazing activity, whereas early afternoon supplementation coincides with a time when cattle are engaged in other non-grazing activities. Yearling crossbred steers averaging 645 lb grazing Russian wild ryegrass were used to evaluate three supplement treatments. Treatments studied were: (1) Russian wild ryegrass without grain supplement; (2) Russian wild ryegrass plus 2 lb of cracked corn fed daily at 7:30 a.m. and (3) cracked corn fed in (2) except fed at 1:30 p.m. The study began September 1 and ran for 84 days. Body weight gains, forage intake and grazing activity were monitored. Steers given supplemental corn in the afternoon gained about 30% more weight than those supplemented in the morning. Weight gains of steers consuming either ryegrass only or ryegrass plus corn supplement in the morning gained an average of 1.4 lb/day while steers given supplement in the afternoon gained 1.8 lb/day.

Following morning or afternoon supplementation, the steers did not graze for two to four hours. Instead, they shifted grazing activity to different time periods of the day. Steers given supplement in the morning spent more time grazing and walked further during the day than did the other two groups of steers. Although steers supplemented in the morning spent more time grazing (9.0 hours/day) than steers supplemented in the afternoon (7.3 hours/day) or those not supplemented (8.4 hours/day), they consumed 11% and 19% less forage than did steers supplemented in the afternoon or those not supplemented, respectively. Digestible energy of the Russian wild ryegrass and corn was estimated by regression procedures (Rittenhouse et al. 1971) and feed composition tables, respectively. Total digestible energy intake was greatest for steers given supplement in the afternoon and least for those given supplement in the morning. Steers supplemented in the morning may have had higher maintenance energy needs (due to increased grazing time and distance traveled) but consumed less dietary energy than steers given supplement in the afternoon. This may explain differences in performance.

The author is a research nutritionist at the USDA-ARS Livestock and Range Research Laboratory, Miles City, Montana 59301 in cooperation with Montana Agricultural Experiment Station, Journal Series No. J-1647.



Management Implications

There are intricacies to be learned about supplementing range cattle and strategies may differ among geographical areas. However, under moderate fall-winter conditions in the Northern Great Plains, these studies show beneficial effects of feeding supplemental grains. The interval between supplementation and time of day that supplements are fed to range animals can modify performance and should be considered as management alternatives to realize more out of grain supplements.

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