BEEF CATTLE RESEARCH UPDATE

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Effect of Calving Period on Gains, Reproduction, and First Calf Characteristics of Heifer Progeny

Researchers with the University of Nebraska used records from 1997 through 2009 to determine the effect of calving date on average daily gain (ADG), reproduction, and first calf characteristics in 1,066 spring born heifer calves at the Gudmundsen Sandhills Laboratory near Whitman, NE.[1] The heifers were classified as being born in the first, second, or third 21 days of the calving period within each year. Calf birth weight was lower for calves born in the first period compared to the second or third period ($P < 0.01$). Calf weaning weight was lower if birth occurred in the third period ($P = 0.03$). Calf ADG from weaning to pre-breeding was greatest ($P < 0.01$) for calves born in the first period, however, ADG from the beginning of the breeding season to pregnancy diagnosis was similar ($P = 0.17$) between calving periods. . The percentage of heifers cycling at the beginning of the breeding season decreased ($P < 0.01$) as the heifers were born later in the calving season (64, 54, and 37%, respectively, for first, second, and third period). In addition, 45 day pregnancy rates were lowest ($P = 0.05$) for heifers born in the third calving period (88, 85, and 74%, respectively). More ($P < 0.01$) calves were born in the first 21 days of the calving season if the heifer herself was born in the first calving period. Furthermore, first calf progeny had the greater ($P < 0.10$) weaning weights if they were born to a heifer that was born in the first calving period.

In summary, heifer calves born during the first 21 days of the spring calving season had greater weaning, pre-breeding, and pre-calving weights, greater percent cycling before breeding and greater pregnancy rates compared to heifers born in the third calving period. In addition, heifers born during the first 21 days of the calving season also had their first calf earlier with greater weaning weights compared to heifers born in the third calving period. These data illustrate that the calving period of heifer progeny significantly impacts development and first calving characteristics.

Effect of Level of Supplemental Protein and Interval Feeding on Utilization of Low-Quality Forage

Reducing winter feed costs for beef cows is important to cow-calf producers since Standardized Performance Analysis records have shown that feed costs account for more than 60% of beef producers' annual cow cost with over one-half of these costs attributed to winter feeding.[2] The labor and transportation expenses associated with supplement feeding contribute significantly to the fixed cost of cattle operations. Therefore, frequency of supplementation is an important management and economic option to consider when designing supplementation programs for beef cattle fed forage-based diets. Numerous research studies have shown that supplementing cattle with high protein supplements (cottonseed meal) three times or once weekly usually gives similar performance compared to daily feeding.[3,4] In contrast, low-protein grain- based supplements should be fed daily to reduce the disruption of ruminal function (due to starch) which results in decreased forage intake and digestibility. Reducing frequency of supplementation may effectively reduce costs of delivery; however, little research has evaluated the level of supplemental protein required with infrequent supplementation. Recent Texas A&M University research quantified forage utilization when graded levels of protein were delivered infrequently.[5]

In this study, ruminally cannulated Angus × Hereford steers (904 lb) were provided ad libitum access to grass hay (2.3% crude protein on dry matter basis). Supplemental protein, provided as a range cube (40.7% crude protein on dry matter basis), was fed to provide specified levels of nitrogen (0, 160, 320 or 480 mg of N/kg body weight) daily (/d) or every third day (/3d). This resulted in the following treatment combinations:

1) 0/d
2) 160/d: 2.22 lb/day of range cubes or 0.9 lb of supplemental protein/day
3) 160/3d: equivalent to 0.74 lb/day of range cubes or 0.3 lb of supplemental protein/day, protein intake is 33.3% of 160/d treatment
4) 320/3d: equivalent to 1.48 lb/day of range cubes or 0.6 lb of supplemental protein/day, protein intake is 66.7% of 160/d treatment
5) 480/3d: equivalent to 2.22 lb/day of range cubes or 0.9 lb of supplemental protein/day, protein intake is 100% of 160/d treatment

As shown in Figure 1, hay organic matter (OM) intake and total OM intake increased with protein supplementation. Total OM intake was lower for the 160/3d than the 160/d and 480/3d treatments. As shown in Figure 2, total digestible OM intakes increased with protein supplementation. However, digestible OM intakes were similar for all treatments receiving supplemental protein. In fact, the data suggested that reducing the amount of supplemental protein provided every third day to 66.7% of that fed to the daily supplemented group (160/d) resulted in the greatest intake of total digestible OM. These researchers concluded that when protein is supplemented infrequently that less protein may be required to support adequate levels of forage intake and digestion. Thus, reducing both the frequency of supplementation and the level of protein provided might be an effective means of reducing cost.

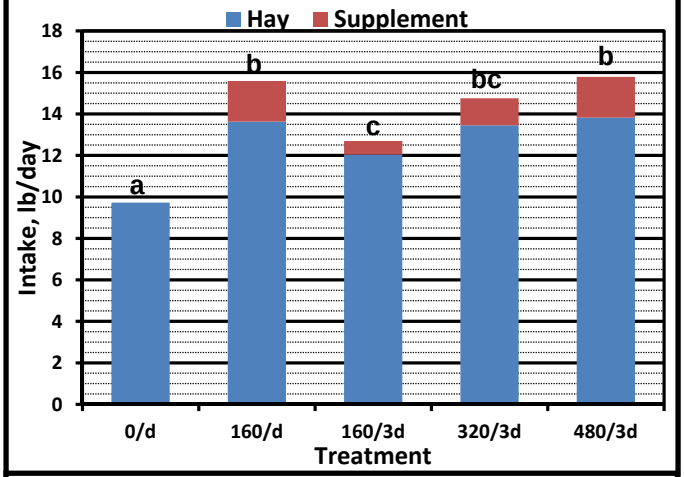

Figure 1. Effect of level and frequency of supplemental protein on daily organic matter intakes. Unlike superscripts differ (P < 0.05). Adapted from Monson et al., 2011.

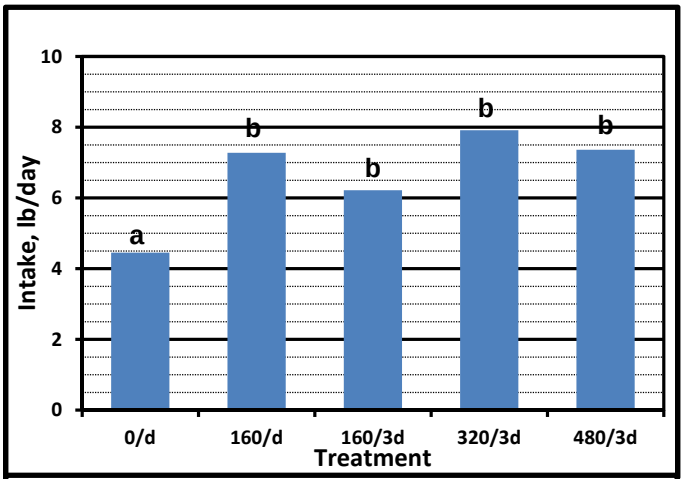

Figure 2. Effect of level and frequency of supplemental protein on digestible organic matter intake. Unlike superscripts differ (P < 0.05). Adapted from Monson et al., 2011.

[1] Funston, R. N., J. A. Musgrave, T. L. Meyer, and D. M. Larson. 2011. Effect of calving period on adg, reproduction, and first calf characteristics of heifer progeny. J. Anim. Sci. 89 (E-Suppl. 2):181 (Abstr.).

[2] Miller, A. J., D. B. Faulkner, R. K. Knipe, D. R. Strohbehn, D. F. Parrett, and L. L. Berger. 2001. Critical control points for profitability in the cow-calf enterprise. Prof. Anim. Sci. 17: 295-302.

[3] Kunkle, W. E., J. T. Johns, M. H. Poore, and D. B. Herd. 2000. Designing supplementation programs for beef cattle fed forage-based diets. J. Anim. Sci. 77 (E-Suppl.): 1-11. Available: http://jas.fass.org/cgi/reprint/77/E-Suppl/1-k.

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[5] Monson, G. R., J. E. Sawyer, R. O. Dittmar III, M. L. Drewery, C. P. Payne, K. C. McCuistion, and T. A. Wickersham. 2011. Effect of level of supplemental protein provided infrequently on utilization of south texas grass hay. Pages 102-103 (Abstr.) in Plains Nutrition Council Spring Conference, San Antonio, TX.

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