

Kansas Agricultural Experiment Station Research Reports

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

Article 126

2008

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Recommended Citation

Linden, D.R.; Anderson, David E.; Pacheco, L.A.; Bolte, J.W.; Sproul, N.A.; Thomas, M.D.; Olson, K. C.; Jaeger, John R.; and Holcomb, Kelsey L. (2008) "Forage intake by pregnant and lactating first-calf heifers," *Kansas Agricultural Experiment Station Research Reports*: Vol. 0: Iss. 1. <https://doi.org/10.4148/2378-5977.1529>

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Forage intake by pregnant and lactating first-calf heifers

Abstract

Forage dry matter intake by mature cows usually decreases during the final 4 to 8 weeks of gestation and then increases dramatically during the first 4 to 8 weeks of lactation. Rapid fetal growth during late pregnancy causes a physical impingement of the rumen. This reduction in ruminal capacity can cause prepartum reduction in forage intake. The rumen recovers its normal volume after calving. The increase in forage intake typical of the postpartum period is driven by milk production. Little research has focused on forage intake patterns by first-calf beef heifers during late gestation and early lactation. It is unknown if forage intake by growing heifers is similar to that of mature cows; moreover, poorly understood intake potential of heifers during the time preceding the second breeding season might contribute to the characteristically high rate of reproductive failure by these animals. Our objective was to measure the effects of advancing gestation and lactation on dry matter intake by first-calf heifers.

Keywords

Cattlemen's Day, 2008; Kansas Agricultural Experiment Station contribution; no. 08-212-S; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 995; Beef; Cattle; Dry matter intake; Gestation; Lactation; First-calf heifers

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FORAGE INTAKE BY PREGNANT AND LACTATING FIRST-CALF HEIFERS

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Introduction

Forage dry matter intake by mature cows usually decreases during the final 4 to 8 weeks of gestation and then increases dramatically during the first 4 to 8 weeks of lactation. Rapid fetal growth during late pregnancy causes a physical impingement of the rumen. This reduction in ruminal capacity can cause parturition reduction in forage intake. The rumen recovers its normal volume after calving. The increase in forage intake typical of the postpartum period is driven by milk production. Little research has focused on forage intake patterns by first-calf beef heifers during late gestation and early lactation. It is unknown if forage intake by growing heifers is similar to that of mature cows; moreover, poorly understood intake potential of heifers during the time preceding the second breeding season might contribute to the characteristically high rate of reproductive failure by these animals. Our objective was to measure the effects of advancing gestation and lactation on dry matter intake by first-calf heifers.

Experimental Procedures

Commercial Angus heifers ($n = 11$; average initial body weight = 1155 ± 116 pounds) were individually fed chopped warm-season grass hay for 137 days from 10 weeks prepartum to 10 weeks postpartum. Hay was fed to heifers free-choice; hay offered and hay refused were recorded daily. Heifers were housed indoors in individual tie-stalls (approximately 6 ft x 3 ft) in an environmentally controlled barn throughout the study period. Treatments were based on pregnancy status.

Six heifers began the study pregnant (average initial day of gestation = 213). After calving (average calving day = day 69 of the study), they were milked by machine twice daily for an average of 10 weeks to approximate milk consumption by a nursing calf. The remaining five heifers served as non-pregnant, non-lactating controls.

Results and Discussion

Forage intake by both groups of heifers increased ($P < 0.01$) over the course of the study (Figure 1), probably because heifers were growing. During the 4 weeks preceding calving, forage intake by the pregnant heifers decreased ($P < 0.01$) compared with that of non-pregnant heifers. Similar depressions in dry matter intake (DMI) have been noted for mature cows during the 8- to 4-week period before calving. The majority of fetal growth occurs during this time. Rapidly growing tissues of the fetus, uterus, and placenta expand into the space inside the body cavity that is normally occupied by the rumen.

In our study, forage intake by pregnant heifers recovered rapidly following calving. By 2 weeks postpartum, it was again equal ($P > 0.10$) to that of non-pregnant, non-lactating heifers. Forage intake was similar ($P > 0.01$) between treatment groups for remainder of the study. This is in stark contrast to what other researchers have reported about intake patterns by lactating mature cows. Normally, diet DMI by mature cows increases dramatically during the first 4 to 8 weeks of lactation. This distinctive increase in intake is caused by the nutrient requirements associated

with milk production. Presumably, lactating first-calf heifers experience a similar upswing in nutrient requirements; however, the lactating heifers in our study did not increase forage intake relative to non-lactating heifers. Reasons for this response are not immediately clear. These data might indicate that the increase in feed intake characteristic of mature cows during early lactation might be absent in first-calf heifers.

Implications

The dramatic increase in feed intake normally observed in mature beef cows during early lactation may be absent in first-calf beef heifers. Absence of a vigorous intake response during the post-calving/pre-breeding period could be a causal factor in reproductive failure by first-calf heifers.

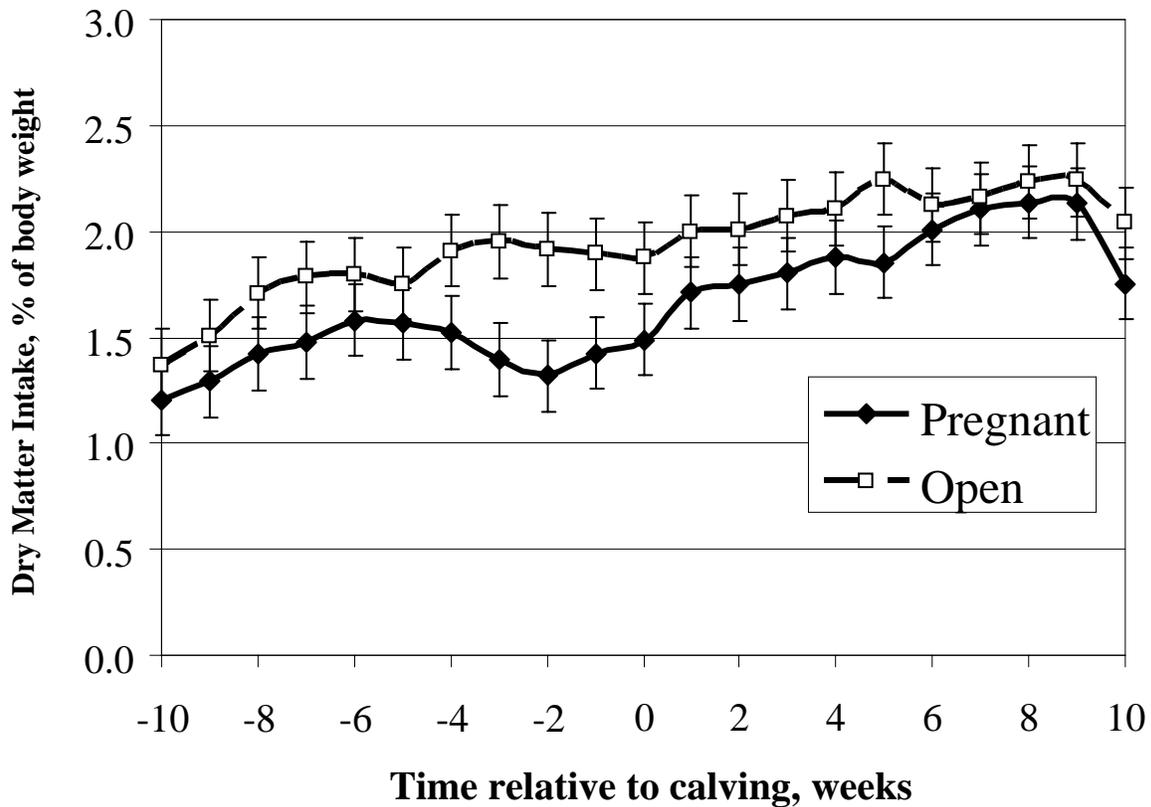


Figure 1. Dry Matter Intake by Pregnant or Lactating Heifers vs. Non-pregnant, Non-lactating Heifers.