North Dakota State University * Dickinson Research Extension Center
1089 State Avenue, Dickinson, ND 58601-4642 Voice: (701) 483-2348 FAX: (701) 483-2005

CREEP FEEDING EFFECTS OF CALF PERFORMANCE AND UDDER AND CARCASS COMPOSITION OF CHAROLAIS CROSSBRED REPLACEMENT HEIFERS

J. E. McLennan, Project Coordinator, NDSU Animal and Range Sciences Graduate Student
D. V. Dhuyvetter, NDSU Extension Livestock Specialist
M. Marchello, Animal and Range Sciences Department, Meat Science
K. Ringwall, NDSU Extension Livestock Specialist, Dickinson Research and Extension Center
G. Ottmar, Dickinson Research and Extension Center

SUMMARY

When feed prices are low creep feeding can provide some advantages to beef cow calf producers such as; increased calf weaning weights, acclimation to concentrate diets and feed bunks; heifers would require less weight gain after weaning to reach puberty by the time of breeding; and during periods of drought, grazing pressure from calves could be reduced. Creep feeding has been very beneficial to the cow/calf enterprise when grass quality decreases towards the end of the growing season and calves become more dependent on other sources of nutrition to achieve their genetic potential for growth. This is oftentimes a common occurrence in North Dakota.

Generally, cattleman retain a portion of their heifers for replacements. However, past research indicates that creep feeding of beef replacement heifers inhibits future milk production and cow longevity. Therefore, many cattle producers may eliminate creep feeding as a practice and are unable to take advantage of the previously mentioned benefits.

INTRODUCTION

Previous creep feeding research with replacement beef heifers has resulted in increased fat deposition in the

open in browser PRO version Are you a developer? Try out the HTML to PDF API pdfcrowd.com

mammary gland, a decrease in milk production during future lactations, reduced progeny weaning weights and decreased cow longevity. Holloway and Totusek et al. (1979) reported heifers that were creep fed produced 0.31 lbs. less milk/d during their first lactation than heifers that received no additional feed during the pre-weaning period. At the University of Florida, Prichard and Marshall et al. (1988) found that creep fed heifers had higher total lipid content (6.4 v.s. 5.2 lbs.) compared to heifers that did not receive creep. Further studies have revealed differences in milk content from heifers creep fed. Hixon et al. (1981) found higher milk butterfat content and an increase in non-fat solids from milk of creep fed replacement heifers compared to controls. These studies were conducted 15 to 20 years ago using cattle that were different in frame size, body composition and growth potential compared to the genetic base of cattle today.

Our goals in conducting this study are to investigate the effects of creep feeding on mammary tissue development, carcass composition and carcass quality in beef heifers. Furthermore, this research project will evaluate carcass composition and quality in beef steers when offered a corn gluten feed creep ration prior to weaning.

PROJECT OBJECTIVES

- To determine calf performance for a corn gluten feed based creep ration fed to suckling Charolais crossbred beef calves grazing native range.
- To determine the effects of a corn gluten feed based creep ration offered free choice to suckling Charolais crossbred beef heifers grazing native range, on mammary tissue development.
- To determine the effects of creep feeding on post weaning gain during backgrounding and finishing, and on carcass measurements.
- Evaluate the use of bio-electrical impedance to measure fat-free mass of creep fed calves fed to finish.

INTRODUCTION

Previous creep feeding research with replacement beef heifers has resulted in increased fat deposition in the mammary gland, a decrease in milk production during future lactations, reduced progeny weaning weights and decreased cow longevity. Holloway and Totusek et al. (1979) reported heifers that were creep fed produced 0.31 lbs. Less milk/d during their first lactation than heifers that received no additional feed during the pre-weaning

open in browser PRO version Are you a developer? Try out the HTML to PDF API pdfcrowd.com

period. At the University of Florida, Prichard and marshall et al. (1988) found that creep fed heifers had higher total lipid content (6.4 v.s. 5.2 lbs.) Compared to heifers that did not receive creep. Further studies have revealed differences in milk content from heifers creep fed. Hixon et al. (1981) found higher milk butterfat content and an increase in non-fat solids from milk of creep fed replacement heifers compared to controls. These studies were conducted 15 to 20 years ago using cattle that were different in frame size, body composition and growth potential compared to the genetic base of cattle today.

Our goals in conducting this study are to investigate the effects of creep feeding on mammary tissue development, carcass composition and carcass quality in beef heifers. Furthermore, this research project will evaluate carcass composition and quality in beef steers when offered a dcorn gluten feed creep ration prior to weaning.

MATERIALS AND METHODS

Preweaning Phase:

Fifty crossbred cows of British origin with Charolais crossbred calves at side will be used in the experiment. Cow-calf pairs will be assigned to one of two pastures each consisting of two paddocks. Cow-calf pairs will be randomly assigned within each pasture to one of two dietary treatments. Treatments will be assigned randomly to paddocks within pastures A and B. Pasture A, consisting of two 160 acre paddocks will have 13 calves (6 heifers, 7 steers) offered a corn gluten feed based creep ration (CRE) free choice beginning day 0 of the experiment (August 15, 1994) in one paddock. The remaining 13 calves will receive no supplemental nutrition (CON) other than native range forage and milk from their dams in the other 160 acre paddock. Treatments will be assigned in the same manner for pasture B (two 160 acre paddocks) except 12 cow-calf pairs (6 heifers, 6 steers) will be used for each treatment. On d 0 (initiation of the experiment) and 70 (weaning date) cows will be measured for bodyweight (BW) and body condition score (BCS). Calf measurements for BW, BCS, hip height (HH) and fat-free mass measured by bio-electrical impedance will also be collected at the same times. Creep feed consumption will be monitored at 2 week intervals up to weaning for calculating feed efficiency for additional weight gain expected by the CRE treatment.

Postweaning Phase:

open in browser PRO version Are you a developer? Try out the HTML to PDF API pdfcrowd.com

Upon weaning, heifers and steers will remain in assigned groups and be placed in one of four pens where they will be fed similar diets through backgrounding (60d) and finishing (180d). Upon slaughter, heifers will be measured for udder composition, fat-free mass, carcass quality grade and yield grade. Steers will be measured for fat-free mass, carcass quality grade and yield grade. Both steers and heifers will be subjected to bio-electrical impedance measurements at the beginning and end of both backgrounding and finishing periods. These values will then be incorporated into the development of prediction equations for carcass yield and retail cut measurements.

RESULTS

It is expected that calves subjected to the creep diet would have higher weaning weights opposed to non-creep fed calves. We also will be able to determine if there are differences in fat-free mass or udder fat deposition due to creep feed treatment effects. These measurements should help increase knowledge in creep feeding effects on future milk production potential of crossbred females that have a high growth potential compared to studies conducted earlier. Furthermore, carcass measurements which include yield and quality grades, may indicate if North Dakota producers can add value to their calves prior to weaning. Results may help those producers who are exploring retained ownership ventures, provided an increase in the quality of specific carcass measurements can be demonstrated. Finally, bio-electrical impedance may become a tool that can be used by cow-calf producers or feeders if equations can be perfected that will accurately predict carcass composition. This will especially become important if live measurements can confidently predict information that relates to the value of the carcass.

LITERATURE CITED

Faulkner, D. B., D. F. Hummel, D. D. Buskirk, L. L. Berger, D. F. Parett, and F. Cmarik. 1994. Performance and nutrient metabolism by nursing calves supplemented with limited or unlimited corn or soyhulls. J. Anim. Sci. 72:470.

Hixon, D. L., G. C. Fahey, D. J. Kisleu, and A.L. Neuman. 1982. Effects of creep feeding and Monensin on reproductive performance and lactation of beef heifers. J. Anim. Sci. 55:3.

Holloway, J. W., and R. Totusek. 1972. Early weaning v.s. normal weaning v.s. creep feeding of replacement heifer calves. Animal Science and Industry Research Reports. No. 87.

open in browser PRO version Are you a developer? Try out the HTML to PDF API pdfcrowd.com

NRC. 1984 Nutrient Requirements of Beef Cattle. (6th Ed.). National Academy Press, Washington, DC.

Prichard, D. L., D. D. Hargrove, T. A. Olsen, and T. T. Marshall. 1989. Effects of creep feeding, zeranol implants and breed type of beef production. J. Anim. Sci. 67:3.

Table 1: Nutrient analysis (percent of dry matter)of a corn gluten feed creep ration fed to Charolais crossbred heifers and steers.

	DM	ASH	CP	ADF	Ca	P
Corn gluten feed creep	90.12	9.87	15.38	18.01	1.04	.64

Table 2: Corn gluten feed creep formulation fed to Charolais crossbred heifers and steers.

Ingredient	Percent
Corn Gluten feed	54.5
Beet Pulp	42.5
Limestone	.95
TM Salt	.95
Vit. ADE	.075
Bovatec premix	.04
Bentonite	.85

open in browser PRO version Are you a developer? Try out the HTML to PDF API pdfcrowd.com

Table 3: Potential cow and calf comparisons for Charolais crossbred heifers and steers fed a corn gluten feed creep formulation.

Measurement	Creep	No-Creep
Body Condition Score	DATA CURRENTLY BEING COLLECTED	
August, 15		
October, 28		
Body Weight		
August, 15		
October, 28		

Table 4: Potential calf comparisons for Charolais crossbred heifers and steers fed a corn gluten feed creep formulation.

Measurement	Creep	No-Creep
ADG	DATA CURRENTLY BEING COLLECTED	
Feed/lb. of additional gain		
Fat Free Mass		
August, 15		
October, 28		
Heifer Quality grade		

open in browser PRO version Are you a developer? Try out the HTML to PDF API pdfcrowd.com

Heifer Yield grade	
Steer Quality grade	
Steer Yield grade	
Udder % Lipid	
Udder % DNA	
Udder % RNA	

Back to 1994 Research Report Table of Contents
Back to Research Reports
Back to Dickinson Research Extension Center (http://www.ag.ndsu.nodak.edu/dickinso/)
Email: drec@ndsuext.nodak.edu

open in browser PRO version Are you a developer? Try out the HTML to PDF API pdfcrowd.com