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Effect of Reduced Gain Prior to Breeding Replacement Heifers -Preliminary Observations -

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Research Summary

Reducing pre breeding gain to 1 lb. per day significantly reduced the artificial inseminated (AI) conception rate, but did not significantly affect overall heifer reproduction. Reducing the rate of gain pre-breeding is not recommended based on preliminary observations.

Introduction

The management of feed costs and gain is critical in any heifer development program. The goal of developing heifers is to attain maximum conception rates at the lowest cost possible. The Dickinson Research Extension Center has been involved in heifer development for four years, and each year has presented the management team challenging but interesting scenarios. In the spring of 1995, a set of heifers gained more than projected and were destined to reach breeding weight earlier than expected. The management team needed to decide to either let the heifers continue to gain and not risk a set back in reproductive performance or decrease the heifer's gain, to lower the cost of development and risk negatively impacting reproduction. The purpose of this trial was to determine if decreasing the rate of gain prior to breeding negatively impacted heifer reproduction.

Materials and Methods

North Dakota Beef Cattle Improvement Association members utilizing the CHAPS production testing program were invited to enter raised heifers born between February and May into the development project conducted in 1995-1996. Consigned heifers were delivered in November to the Dickinson Research Extension Center-Manning Ranch Unit. Heifers were managed as described by Ringwall, et al "Production and Associated Costs of Heifer Development" in the *1998 Dickinson Research Extension Center Annual Report*.

Heifers were given an adaption period in which a receiving ration was fed and health was closely monitored. Once on feed, heifers were weighed on test, body condition scored, frame scored, disposition scored, and allocated to feeding groups based on weight and target gain. Target gain was determined by calculating the gain needed to achieve 70% of a frame score projected mature weight at the start of breeding. Mature weight was projected by the following formula: mature weight = (frame score*75) + 800. Heifers were maintained in these groups, and averaged of 2.0 lbs. per day from January 29 to March 12.

Heifers were reevaluated on March 12 and were randomly allocated to four pens. One of two treatments was randomly assigned to each pen. NRC guidelines and actual feed analysis were used to formulate a total mixed ration designed to meet the desired level of gain for each treatment. Heifers on treatment one were targeted to gain 1.5 pounds per day with treatment two targeted to gain 1.0 pound per day. These high roughage rations consisted of corn silage, oatlage, alfalfa hay, oat hay, and were supplemented with white salt, dicalcium phosphate, and a commercially prepare mineral-vitamin premix that included the ionophore Bovatec^{TM}.

Heifers were estrus synchronized with SYNCRO-MATE-B^{TM} to facilitate a single AI service followed by a 45-day natural service cleanup. Estrus activity was monitored and breeding heat detected with the use of KMAR^{TM} patches. An overall pregnancy rate and AI conception rate were calculated. Reproductive data was analyzed with Chi-Square procedures through SAS.

Results and Discussion

The results are presented in Table 1. These heifers were reevaluated on March 12 and the management team concluded that the heifers were gaining more weight than desired. The decision was made to reduce the heifers to two different levels of gain and monitor reproductive performance. Both sets of heifers were gaining at 2.0 lbs. per day and half the heifers were reduced to 1.5 lbs. per day and the other half were reduced to 1 lb. per day. The condition scores were similar for each treatment group with overall body condition increasing slightly over the test period. Reducing pre-breeding gain to 1 lb. per day significantly reduced the AI conception rate, but did not significantly affect overall heifer reproduction. The same negative effect on AI conception was noted regardless if the heifer was gaining less than 2 lbs. per day, or 2 lbs. per day or more, prior to reduced gain treatments started on March 12 (table 2).

Table 1. Growth and reproductive performance of heifers with reduced gain prior to breeding.

	Treatment 1 1.5 lbs./day gain	**Treatment 2 1 lb./day gain**
Number of heifers	23	25

Weight		
November 28	618	586
January 29	649	627
March 12	736	713
May 2	810	773
Percent estimated mature weight at breeding	67	65
Condition score		
March 12	6.6	6.5
May 2	6.8	6.8
Average daily gain		
January 29 to March 12	2.0	2.0
March 12 to May 2	1.5	1.0
Reproduction		
AI conception percent[1]	78	33
Percent expressing estrous	100	96
Overall pregnancy percent	91	84
[1]AI conception percent was significantly different (P<.05).		

Table 2. Effect of average daily gain before the reduced gain treatments on reproductive performance.

	Treatment 1 1.5 lbs./day gain	Treatment 2 1 lb./day gain
ADG less than 2 pounds		
AI conception percent	73	27
Percentage expressing estrous	100	100
Overall pregnancy percent	91	87
ADG 2 pounds or greater		
AI conception percent	83	44
Percent expressing estrous	100	90
Overall pregnancy percent	92	80

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