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EFFECT OF BULL EXPOSURE ON REPRODUCTIVE PERFORMANCE OF FIRST-CALF HEIFERS BRED BY NATURAL SERVICE

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Summary

Ninety-four spring calving, first-calf heifers were allotted to one of two treatment groups, control or bull exposed, to study the effect of bull exposure early postpartum on rebreeding performance when bred by natural service. Bull exposure early postpartum had no effect on pregnancy rate. However, bull exposure unexpectedly increased the subsequent calving interval by 9 days ($P < .05$) and delayed the average calving date by 7 days ($P < .05$). Under the conditions of this study in which heifers were in condition score 5 or better at calving and bred by natural service, bull exposure early postpartum did not improve reproductive performance.

(Key Words: Bull Exposure, Calving Interval, Reproductive Performance, First-calf Heifers.)

Introduction

Bull exposure has been shown to reduce the interval from calving to first estrus by 15 to 20 days and increase the percentage cycling prior to breeding. If these effects result in a shorter calving interval, subsequent calf weaning weights should be increased by having older calves at weaning. For this reason the economics of bull exposure could be favorable. Unfortunately, few studies have presented production endpoints suitable for calculating economic return. To further confuse the economics of bull exposure, condition score of the female, and method of breeding (natural service or synchronization and artificial insemination) can influence the biological response to bull exposure.

This study was conducted to evaluate the effect of bull exposure on reproductive performance of first-calf heifers when rebred by natural service.

Materials and Methods

This trial was conducted on a commercial ranch in southwestern South Dakota in the spring of 1991. Ninety-four spring calving, crossbred, first-calf heifers with an average calving date of March 1 were allotted by calving date to either a control or bull exposed treatment. Treatment groups were maintained in separate pastures with no audio or visual contact. Heifers were fed alfalfa/grass hay free choice, 2 lb of a 14% protein pellet and 5 lb of ear corn after calving.

A total of 48 heifers were exposed to two, epididectomized, yearling Angus bulls within 2 weeks of calving. Epididectomized bulls were removed on April 30 and the treatment groups were co-mingled at this time. Four yearling Angus bulls were turned in on June 4 for a 60-day breeding season.

A total of four heifers were removed from the study due to one abortion, one did not return from summer pasture, and two were lost from ranch records. Thus, 45 head per treatment were available for data analysis. Calving interval was calculated as the number of days between the first and second calving date. No attempt was made to measure the interval from calving to first estrus.

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Results and Discussion

The effect of bull exposure on reproductive performance is shown in Table 1. Bull exposure had no effect on pregnancy rate. However, bull exposure unexpectedly increased the subsequent calving interval by 9 days ($P < .05$) and thus delayed the average calving date by 7 days ($P < .05$). These results are difficult to interpret because bull exposure has not had a negative effect on reproduction in previous studies.

These results, combined with results of previous studies, suggest several factors interact to moderate the biological response to bull exposure. For example, both SDSU and Nebraska research have documented diminishing effects of bull exposure when the experimental cattle were in good body condition. The average condition score of 5.1 for this experiment suggests that cattle adequately nourished may not have

a positive response to bull exposure. Furthermore, in this study, treatment groups were co-mingled some 35 days before the breeding season began and rebred by natural service. Either of these practices could have induced cycling activity in some noncycling heifers and could have skewed the data in favor of the controls. This would be in contrast to results obtained from trials in which estrus synchronization and artificial insemination were utilized to rebreed the cattle. In a synchronization program, the females may not be exposed to bulls at any time, which would eliminate any bull stimulus. Thus, exposure to sterile bulls could be of economic benefit in this situation.

In summary, under the conditions of this study in which first-calf heifers in condition score 5 or greater at calving were rebred by natural service, bull exposure early postpartum was not economically advantageous.

Table 1. Effect of bull exposure on rebreeding performance of first-calf heifers

Item	Treatment		SE
	Control	Bull exposed	
Condition score at calving ^a	5.1	5.1	
Pregnancy rate, %	91 (41/45)	91 (41/45)	
Calving interval, days	386 ^b	395 ^c	2.80
Avg calving date, 1992	3/22 ^b	3/29 ^c	2.00

^a 1 = emaciated to 9 = obese.

^{b,c} Means with unlike superscripts differ ($P < .05$).