

REPRODUCTIVE REGULARITY FOR YOUNG COWS Sired BY HIGH AND LOW MILK EPD ANGUS AND POLLED HEREFORD BULLS

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Story in Brief

Reproductive performance for 162 cows with a weaned calf in 1993 sired by High and Low Milk EPD Angus and Polled Hereford bulls was evaluated. Cows ranged in age from two to four years and were fairly evenly divided into spring and fall calving herds. This study reports the regularity of calving for these cows over the subsequent three years. The percentage of calves born following a desirable 11 to 13 month calving interval was investigated. Additionally, the calving interval for cows with a calf "on schedule" (11 to 13 month calving interval) for each of the three subsequent years was studied to determine if differences in calving interval were accumulating. For some of the measures of reproductive regularity, Polled Hereford sired cows had poorer performance than Angus sired cows. This poorer performance was particularly striking with youngest (two years old in 1993) Polled Hereford sired cows. Differences between groups based on Milk EPD were small and showed no consistent advantage to either High or Low Milk EPD cows. These results, in conjunction with results reported previously, illustrate that producers should be able to use Milk EPD to improve maternal ability in a commercial beef herd without a serious cost in reproductive performance.

(Key Words: Beef Cattle, Reproduction, Expected Progeny Difference.)

Introduction

Increased maternal ability in beef cows may be expected to have a negative effect on reproductive performance. Increased milk production results in increased protein and energy need (or demand). Previous results (Buchanan et al., 1993, 1995, 1996a) have shown that the Milk EPD is an effective tool for increasing calf weaning weight but at the expense of cow body condition. Preliminary results (Buchanan et al., 1996b) described a very slight decline in reproductive performance, measured by calving percentage, calving date and calving interval, in cows sired by bulls with high Milk EPD. The objective of this study is to further examine the reproductive performance of cows differing in maternal ability because their sires differ in Milk EPD.

Materials and Methods

Beginning in 1988, cows at the North Lake Carl Blackwell Research Range near Stillwater, OK were mated artificially to Angus and Polled Hereford bulls that differed widely in Milk EPD. The base cows were Hereford-Angus, 1/4 Brahman - 1/2 Hereford - 1/4 Angus or 1/4 Brahman -

1/2 Angus - 1/4 Hereford. Cows in the present report were born in the spring and fall of 1989 through 1991. Previous results were reported by Buchanan et al. (1993, 1995, 1996a,b).

The cows were mated artificially to calve first at 24 months of age (both spring and fall seasons) and yearly thereafter. If a cow failed to conceive in the appropriate 60-day breeding season, she was moved to the other season instead of allowing her to remain non-pregnant. Salers, Limousin, Gelbvieh, Angus and Polled Hereford bulls were used to sire calves.

One hundred sixty-two cows weaned a calf during 1993 (spring and fall calving seasons). Cows varied in age from two to four years. The three and four year old cows had calved previously. This report will follow those cows from 1994 through 1996 to examine regularity of calving during those three years. Ideally each spring calving cow in 1993 should have a calf during each of the three subsequent spring calving seasons. In like manner, those cows calving during the fall of 1993 should also have a calf during each of the three subsequent fall calving seasons. Not all cows have this type of regular reproductive pattern. In order to investigate regularity of calving three percentages were calculated. The first percentage value was the percentage of cows with all three subsequent calves born during the appropriate calving seasons (approximately 11 to 13 month calving interval). Additionally, percentages of cows with at least two calves following an 11 to 13 month calving interval and those with at least one calf born after an 11 to 13 month interval following the previous calf were calculated. For those cows who did have three calves at the appropriate 11 to 13 month intervals, the average calving interval was calculated to determine if differences in calving interval were beginning to accumulate, even among those cows with calves born during the appropriate calving seasons.

Data were analyzed with a statistical model that included season, age of dam, breed of sire, level of Milk EPD of the sire and interactions among those variables. Means were compared using the least significant difference.

Results and Discussion

Percentage of calves born at regular (11 to 13 month) calving intervals is presented in Table 1. Three calves percent is the proportion of cows with a calf, born 11 to 13 months after her previous calf, for all three calf crops. This indicates the number of spring calving cows during spring of 1993 who had a calf each of the three subsequent spring calving seasons (similarly for cows with calves during fall of 1993). Two calves percent is the proportion of cows with a calf in 1993 who had at least two additional calves in the next three years born following an 11 to 13 month calving interval. One calf percent is the proportion of cows with a calf in 1993 who had at least one additional calf in the next three years born following an 11 to 13 month calving interval. There was a significant interaction between cow group (breed and milk EPD level) and age of dam. The interaction resulted from the excellent performance of the youngest (two years old in 1993) Angus sired cows and the very poor performance of the youngest Polled Hereford sired cows even though the older cows (three or four years old in 1993) showed only small differences among breed and milk level groups. None of the two year old (in 1993) High Milk EPD Polled Hereford cows had a calf during all three subsequent years and only one third of the

Low Milk EPD Polled Hereford cows had a calf during all three subsequent years. This contrasted greatly with the outstanding performance of the Angus sired cows (72.2% and 83.5%, High and Low Milk EPD respectively). In many, though not all, cases the calving performance was slightly lower for High Milk EPD groups. The difference was significant ($P < .1$) only for Angus sired cows who were 3 years old in 1993 having two or more additional calves on schedule (11 to 13 month calving interval). These results do provide little evidence that High Milk EPD cows have difficulty calving on schedule, relative to low Milk EPD cows during the earlier stages of their productive life. This is in spite of considerable evidence in this cow herd that the differences in calf weaning weight were consistent with expectations based on the Milk EPDs and that the increased weaning weights in calves from High Milk EPD cows came at the expense of cow body condition (Buchanan et al., 1993, 1995, 1996a).

In order to further investigate calving regularity a second data set was constructed with only those cows who had three calves with 11 to 13 month calving intervals. This analysis was performed to evaluate the degree to which differences were accumulating in calving interval, even among cows with a regular rebreeding schedule, which could, at a later time in life, lead to a failure to calve on schedule. These results are presented in Table 2. Polled Hereford sired cows had a longer ($P < .1$) calving interval between 1993 and 1994 than Angus sired cows but this difference was reversed during the interval between 1994 and 1995. In no cases were there significant ($P < .1$) differences between the corresponding High and Low Milk EPD groups. Again, this gives little evidence suggesting delayed calving in cows that weaned heavier calves due to genetic advantages in maternal ability (Milk EPD).

These results pose some interesting questions. How are these High Milk EPD cows able to raise heavier calves and lose body condition but still breed approximately as regularly as the Low Milk EPD cows? Will these small differences in reproductive performance persist or will they become more pronounced as the age of the cows advances? Do the High Milk EPD cows begin regular estrus cycles as soon after calving as the Low Milk EPD cows? Does level of supplemental feeding influence the relative reproductive performance of High vs Low Milk EPD cows. These, and other questions, will be investigated in future analyses. For the present there is little evidence that a difference in reproductive performance exists between young cows that differ widely in Milk EPD for these two breeds.

Literature Cited

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Table 1. Percentage of cows with at least three calves, two calves or one calf born during the calving season one year following a previous calf for cows sired by High and Low Milk EPD Angus and Polled Hereford bulls.

		Age of dam ^a		Three calves percent ^b	Two calves percent ^c	One calf percent ^d
Breed	Level		n			
Angus	High	2	15	72.2 ^e	93.5 ^e	100.0 ^e
Angus	Low	2	7	83.5 ^e	83.7 ^e	100.0 ^e
P. Hereford	High	2	7	0.0 ^f	28.9 ^f	86.7 ^e
P. Hereford	Low	2	12	33.3 ^f	75.0 ^e	91.7 ^e
Angus	High	3	15	58.8 ^e	60.1 ^e	93.3 ^e
Angus	Low	3	15	45.6 ^e	85.7 ^f	100.0 ^e
P. Hereford	High	3	10	56.6 ^e	90.5 ^f	90.0 ^e
P. Hereford	Low	3	17	44.2 ^e	80.9 ^f	94.2 ^e
Angus	High	4	16	39.6 ^e	80.9 ^e	93.7 ^e
Angus	Low	4	19	51.6 ^e	90.4 ^e	100.0 ^e
P. Hereford	High	4	10	66.6 ^e	70.5 ^e	90.0 ^e
P. Hereford	Low	4	19	50.0 ^e	79.3 ^e	94.7 ^e
Average standard error				13.1	11.3	6.3

^aAge of dam is the age of the cow during the 1993 calving season.

^bThree calves percent is the percentage of cows with a calf in 1993 who also had a calf during each of the three subsequent years during the same calving season.

^cTwo calves percent is the percentage of cows with a calf in 1993 who had at least two calves born during the subsequent three years with an approximate 12 month calving interval.

dOne calf percent is the percentage of cows with a calf in 1993 who had at least one calf born during the subsequent three years with an approximate 12 month calving interval.

e,fMeans with different superscripts within a column and within age of dam groups differ significantly ($P < .1$).

Table 2. Calving intervals, for cows sired by High or Low Milk EPD Angus and Polled Hereford bulls, with a weaned calf in 1993 who also calved during each of the three subsequent years.					
			Calving interval ^a		
Breed	Level	n	93 to 94	94 to 95	95 to 96
Angus	High	26	376.3 ^b	367.7 ^b	358.6 ^b
Angus	Low	22	371.4 ^b	367.1 ^b	358.3 ^b
P. Hereford	High	13	389.9 ^c	350.4 ^c	367.8 ^{bc}
P. Hereford	Low	20	381.1 ^{bc}	355.9 ^{bc}	372.8 ^c
	Average standard error		4.9	4.7	4.8

aCalving interval is expressed as the number of days between calvings in 1993 and 1994, 1994 and 1995, and 1995 and 1996, respectively, for cows that had calves all years of the study.

b,cMeans with different superscripts, within a column, differed significantly ($P < .1$).