

REPRODUCTION PERFORMANCE FOR COWS Sired BY HIGH AND LOW MILK EPD ANGUS AND POLLED HEREFORD BULLS - A PRELIMINARY REPORT

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Story in Brief

Reproductive performance for cows sired by High and Low Milk EPD Angus and Polled Hereford bulls was evaluated. There were 161 cows that weaned a calf in 1993. These cows ranged in age from two to four years and were fairly evenly divided into spring and fall calving herds. This study reports the reproductive performance of these cows over the subsequent two years. Calving %, calving interval and average birth date were calculated while these cows had an opportunity to calve twice during the next two years. Calving % in the second year was not affected very much by level of Milk EPD although calving interval was slightly extended for cows with High Milk EPD sires. The average birth date also tended to be slightly later. In the third year, calving % was smaller for cows with High Milk EPD sires. Calving interval for the third calf was changed only slightly by level of Milk EPD and average calving date in the third year was slightly later for cows sired by High Milk EPD bulls. Very few of the differences achieved statistical significance and these results should be viewed as being preliminary. However, these three measures of reproductive performance, when examined together over a three year period, suggest that the High Milk EPD cows may be beginning to falter 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. The energy given to the calf via the milk is a biological cost that has to detract from the cow in some way unless she is able to consume enough additional energy to accommodate the increased milk production. The first visible indication that the cow may be deficient is likely to be a loss in body condition. Previous results (Buchanan et al. 1993, 1995, 1996) have shown that the Milk EPD is an effective tool for increasing calf weaning weight but that there is a cost in cow body condition. The objective of this study is to examine the reproductive performance of cows differing in maternal ability because their sires differ in Milk EPD.

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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 crossbred cows. Cows in the present report were born in the spring and fall of 1989 through 1992. Previous results were reported by Buchanan et al. (1993, 1995, 1996).

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 holding her open for an entire year. Salers, Limousin, Gelbvieh, Angus and Polled Hereford bulls were used to sire calves in this project.

There were 164 cows that weaned a calf during 1993 (spring and fall calving seasons). These 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 through 1994 and 1995 to examine whether they calved, and if they did have a calf, to determine the calving interval and the date of calving. The calving % was determined in 1994 and 1995 and was defined as the proportion of cows that gave birth to a calf (alive or dead) during the same calving season one year following their previous calf. Calving interval was determined by counting the days between subsequent calvings without regard to the season. Calving interval was determined between first calf (born in 1993) and second calf and between second calf and third calf. Birth date was calculated for 1994 and 1995 for those cows that calved during the calving season one year after their previous calf. None of these three variables (calving %, calving interval or birth date) gives a complete picture of reproductive performance alone. Together, they indicate whether cows calve on schedule and whether cows are calving at a different point in the calving season or are delayed sufficiently to have their next calf in a subsequent season.

Data were analyzed with a statistical model that included season, sex of calf, age of dam, breed of sire, level of Milk EPD of the sire and interactions among those variables. Birth date of the calf born in 1993 was included as a covariate for birth date of calves born in 1994 and 1995.

Results and Discussion

Calving % in 1994 and calving interval to the second calf are reported in Table 1. Calving % is the proportion of cows that weaned a calf in 1993 that also gave birth in the proper season in 1994. Cows sired by High Milk EPD Angus bulls had a slightly lower calving % in 1994 than cows sired by Low Milk EPD Angus bulls. The reverse was true for cows sired by Polled Hereford

bulls. Neither difference was statistically significant and the opposite result for the two breeds give little indication of a trend in reproductive performance changes.

Calving interval is the number of days from the calf born in 1993 to the second calf, regardless of the season in which that second calf was born. Cows sired by High Milk EPD bulls took longer to have another calf than cows sired by Low Milk EPD bulls. The differences were not statistically significant. The number of days lost (20 or more days for both breeds) suggests that some loss in reproductive performance may be accumulating.

Average birth dates of calves born in 1994 are shown in Table 2 for both spring and fall calving seasons. These calves are from cows calving in the season in 1994 that was one year after they had their calf in 1993. The Julian dates are the number of days after January 1. Differences between breed and level were not statistically significant and were not uniform in direction. These results again gave little indication of a change in reproductive performance.

Calving % in 1995 and calving interval from second to third calf in this study are shown in Table 3. Calving % is the proportion of cows that calved in 1994 that had a calf in the same season one year later. Cows sired by High Milk EPD bulls had a lower calving % for both Angus and Polled Hereford sired cows. The difference (83.3 vs 99.9 %) was significant ($P < .05$) for Angus sired cows. Calving interval in Table 3 was measured between the second and third calves born in this study. They were substantially smaller than the calving intervals between first and second calves because some of these cows may have a calf during 1996 and these births could not be included. Cows sired by High Milk EPD bulls had slightly shorter calving intervals. This result must be viewed in conjunction with the lower calving % for the cows by High Milk EPD bulls. Together, the calving % in 1995 and calving interval likely indicate a decline in reproductive performance.

Average birth date in 1995 is reported in Table 4. These are birth dates of cows calving in 1995 that had a calf during the same season the previous year. Again, while none of the differences were statistically significant, cows by High Milk EPD sires consistently calved a bit later in the calving season than cows sired by Low Milk EPD bulls.

These results describing reproductive performance are preliminary. There have not been enough calvings to draw firm conclusions and the oldest cows were only six years old in the concluding year of this study. None-the-less, there did appear to be a gradual loss in reproductive performance. The combination of slightly lower calving %, longer calving interval to the second calf and slightly later birth dates indicate that changes in reproductive performance may have been occurring in conjunction with the loss in condition score reported previously (Buchanan et al., 1996). Further reports from subsequent years may confirm or deny this preliminary analysis.

Literature Cited

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Table 1. Calving % (second year) and calving interval (first calf to second calf) for cows sired by High and Low Milk EPD Angus and Polled Hereford bulls.

Breed	Level	n	Calving % ^a	Calving interval ^{b,c} (days)
Angus	High	46	84.9 ± 5.7	451.7 ± 19.09
Angus	Low	41	87.7 ± 6.2	431.9 ± 21.08
P. Hereford	High	28	83.3 ± 6.8	474.1 ± 23.12
P. Hereford	Low	49	81.4 ± 5.1	448.3 ± 18.99

^a Calving % is the proportion of cows that calved during the same season in the second year as they did during the first year.

^b Calving interval is the number of days to the second calf, regardless of calving season.

^c No significant ($P > .10$) differences between High vs Low for either breed.

Table 2. Second year calving date least squares mean for cows sired by High and Low Milk EPD Angus and Polled Hereford bulls.

Breed	Level	Season	n	Calving date ^{a,b} (julian day)
Angus	High	Spring	11	83.8 ± 9.91
Angus	Low	Spring	12	75.9 ± 9.71
P. Hereford	High	Spring	6	84.1 ± 10.86
P. Hereford	Low	Spring	11	84.2 ± 9.68
Angus	High	Fall	30	269.2 ± 8.74
Angus	Low	Fall	25	268.2 ± 9.10
P. Hereford	High	Fall	18	272.3 ± 8.48
P. Hereford	Low	Fall	31	269.7 ± 8.60

^a Calving date is the number of days after January 1 for cows that calved in the same season during the second year that they did during the first year.

^b No significant ($P > .10$) differences between High and Low for a breed season group.

Table 3. Calving % (third year) and calving interval (second calf to third calf) for cows sired by High and Low Milk EPD Angus and Polled Hereford bulls.

Breed	Level	n	Calving % ^a	Calving interval ^{b,c,d} (days)
Angus	High	36	83.3 ± 4.9	370.8 ± 7.61
Angus	Low	37	99.9 ± 5.3	379.0 ± 7.35
P. Hereford	High	20	85.1 ± 6.4	362.0 ± 10.00
P. Hereford	Low	39	91.5 ± 4.7	368.2 ± 7.03

^a Calving % is the proportion of cows calving the second year that also calved during the same season in the third year.

^b Calving interval is the number of days from the second calf to the third calf, regardless of calving season.

^c No significant ($P > .10$) differences between High vs Low for either breed.

^d These calving intervals are lower than the corresponding intervals in Table 1, in part, because some of these cows are yet to calve in 1996.

Table 4. Third year calving date least squares mean for cows sired by High and Low Milk EPD Angus and Polled Hereford bulls.

Breed	Level	Season	n	Calving date ^{a,b} (julian day)
Angus	High	Spring	9	76.5 ± 12.88
Angus	Low	Spring	10	60.4 ± 12.26
P. Hereford	High	Spring	5	59.3 ± 13.98
P. Hereford	Low	Spring	9	57.3 ± 12.59
Angus	High	Fall	27	274.2 ± 11.10
Angus	Low	Fall	27	268.1 ± 11.74
P. Hereford	High	Fall	15	272.9 ± 11.11
P. Hereford	Low	Fall	30	268.6 ± 10.98

^a Calving date is the number of days after January 1 for cows that had a calf during the same season of the third year as they calved during the second year.

^b No significant ($P > .10$) differences between High and Low for a breed season group.