

CALF PERFORMANCE AND COW WEIGHT AND CONDITION FOR COWS Sired BY HIGH AND LOW MILK EPD ANGUS AND POLLED HEREFORD BULLS

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Story in Brief

Calf birth and weaning weight and cow weight and condition score were evaluated for cows sired by High and Low Milk EPD Angus and Polled Hereford bulls. There were 361 cow-calf pairs. Heifer calves from daughters of High Milk EPD bulls were heavier at birth than heifers from daughters of Low Milk EPD bulls. The opposite was true for steer calves. Both steer and heifer calves from daughters of High Milk EPD bulls were substantially heavier at 205 days than calves from daughters of Low Milk EPD bulls. The advantages for calves from Angus sired cows were 65 and 25 lb for steers and heifers, respectively. High Milk EPD Polled Hereford sired cows had steers and heifers that were 42 and 13 lb heavier, respectively, than Low Milk Polled Hereford. The differences were larger than expected from the Milk EPDs for steer calves. Cows sired by Low Milk EPD bulls were generally heavier at weaning than cows sired by High Milk EPD bulls although this was not true in every calving season and breed group. Body condition at weaning in cows sired by High Milk EPD bulls was substantially lower than for Low Milk EPD bulls. Daughters from High Milk EPD bulls can be expected to have heavier calves at weaning, but there may be a cost in cow weight and body condition.

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

Introduction

A cow-calf enterprise should have, as its goal, a calf from every cow each year. Ideally those calves would be heavy and of high quality. The maternal ability of the cows in the herd has an influence upon the herd's ability to accomplish that goal. Cows with high genetic merit for maternal ability should wean heavy calves at weaning due to milking ability and possibly other contributions the cow makes to the welfare of the calf. This additional milk is likely not without some cost in cow weight and condition. Several beef breed associations publish predictions of genetic merit for several traits associated with growth and maternal ability. These predictions are called Expected Progeny Differences (EPDs). The Milk EPD predicts genetic merit for maternal ability. The EPD difference between two bulls should be a prediction

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of the difference in calf weaning weight between calves from daughters of the two bulls, due to maternal ability. The objective of this study was to evaluate the usefulness of the Milk EPD for predicting calf performance and to assess the effect on cow weight and body condition.

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). Average EPD values for the sires of these cows are shown in Table 1. The difference in Milk EPD between High and Low was 32.9 lb for Angus and 27.3 lb for Polled Hereford. There were small average differences in EPD for birth weight and weaning weight. The published accuracies for all bulls exceeded .60 for Milk EPD. These results are from calves born in 1993 and 1994.

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-d 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 in this project. Calves were weighed and males were castrated with 12 h of birth. Weaning weight was measured when the average age of the calves was 205 d. Cow weight and condition score (1 = extremely thin to 9 = obese) were evaluated at weaning.

There were 188 heifer calves and 173 steer calves included in this analysis. Birth weight, weaning weight, cow weight and cow condition score were analyzed with a statistical model that included breed of sire, Milk EPD level, sex of calf, season, age of dam and two level interactions.

Results and Discussion

Calf performance least squares means are shown in Table 2. Steers were heavier ($P < .01$) than heifers for both birth weight and 205-d weight. There was an interaction between breed-milk level and sex of calf. Heifers from daughters of Low Milk EPD bulls were slightly heavier than heifers from daughters of High Milk EPD bulls. Steers from daughters of High Milk EPD bulls were heavier at birth than steers from daughters of Low Milk EPD bulls and the difference was significant for calves from Angus sired cows (85.9 vs 81.2 lb for High and Low, respectively).

Calves from daughters of High Milk EPD bulls were heavier than daughters of Low Milk EPD bulls for each breed and sex combination. The advantage for High vs Low was significant for heifers from daughters of Angus bulls (448.0 vs 423.5 lb, $P<.05$), steers from daughters of Angus bulls (490.8 vs 435.6 lb, $P<.01$) and steers from daughters of Polled Hereford bulls (473.1 vs 431.0 lb, $P<.01$). The differences for heifers were smaller than expected from the EPDs of the bulls but the differences for steer calves was much larger than the expectation.

Cow weight least squares means are presented in Table 3. There was a significant ($P<.05$) interaction between breed-milk level and season. Cows sired by High Milk EPD bulls tended to be lighter than cows sired by Low Milk EPD bulls except for Polled Hereford sired cows in both spring calving groups. The larger cow weight for Low Milk EPD cows was significant ($P<.05$) for both breed groups in the Fall 1994 calving season.

Condition score least squares means are presented in Table 4. Cows sired by High Milk EPD bulls had lower condition score for both breed groups. This difference was significant ($P<.01$) for Angus sired cows (4.88 vs 5.26).

These results, along with previous reports from this project (Buchanan et al., 1993, 1995) are consistent in their confirmation of the utility of the Milk EPD as a tool for prediction of genetic merit for maternal ability in beef cattle. The results also illustrate clearly that there may be a cost in condition score, which may lead to diminished ability to rebreed. A preliminary analysis of reproductive performance is in an accompanying article (Buchanan et al., 1996). Beef producers can use the Milk EPD with confidence but should have a clear understanding of their feed resources before bulls with extremely high Milk EPDs are used.

Literature Cited

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Table 1. Average expected progeny different (lb) for High vs Low Milk EPD Angus and Polled Hereford bulls.

| Breed | Level | n | BW EPD | WW EPD | Milk EPD |
|-------------|-------|----|--------|--------|----------|
| Angus | High | 13 | 2.5 | 21.3 | 19.2 |
| Angus | Low | 13 | 5.1 | 26.8 | -13.7 |
| P. Hereford | High | 9 | 2.6 | 22.3 | 16.8 |
| P. Hereford | Low | 9 | 5.6 | 26.3 | -10.5 |

Table 2. Birth weight and 205-day weight least squares means for calves from daughters of High and Low Milk EPD Angus and Polled Hereford bulls.

| Sex | Breed | Level | n | Birth wt (lb.) ^a | 205 day wt (lb) ^a |
|--------|-------------|-------|----|-----------------------------|------------------------------|
| Heifer | Angus | High | 52 | 76.8 ± 1.37 | 448.0 ± 6.88 ^d |
| Heifer | Angus | Low | 49 | 79.3 ± 1.46 | 423.5 ± 7.36 ^e |
| Heifer | P. Hereford | High | 31 | 76.4 ± 1.81 | 425.7 ± 9.08 |
| Heifer | P. Hereford | Low | 57 | 79.7 ± 1.33 | 412.3 ± 6.72 |
| Steer | Angus | High | 45 | 85.9 ± 1.49 ^b | 490.8 ± 7.50 ^f |
| Steer | Angus | Low | 51 | 81.2 ± 1.40 ^c | 435.6 ± 7.02 ^g |
| Steer | P. Hereford | High | 30 | 86.8 ± 1.78 | 473.1 ± 8.93 ^h |
| Steer | P. Hereford | Low | 47 | 85.7 ± 1.44 | 431.0 ± 7.25 ⁱ |

^a Steers were heavier than heifers (P<.01).

^{b,c,d,e} Least squares means for high vs low were different (P<.05).

^{f,g,h,i} Least squares means for high vs low were different (P<.01).

Table 3. Cow weight least squares means for cows sired by High and Low Milk EPD Angus and Polled Hereford bulls.

| Season | Breed | Level | n | Cow wt (lb) |
|-----------|-------------|-------|----|-----------------------------|
| Fall 93 | Angus | High | 23 | 946.2 ± 23.02 |
| Fall 93 | Angus | Low | 19 | 987.4 ± 27.33 |
| Fall 93 | P. Hereford | High | 16 | 962.9 ± 28.30 |
| Fall 93 | P. Hereford | Low | 21 | 1009.1 ± 24.44 |
| Fall 94 | Angus | High | 35 | 959.2 ± 19.23 ^a |
| Fall 94 | Angus | Low | 29 | 1014.7 ± 21.33 ^b |
| Fall 94 | P. Hereford | High | 21 | 1027.9 ± 24.54 ^c |
| Fall 94 | P. Hereford | Low | 33 | 1082.7 ± 20.46 ^d |
| Spring 93 | Angus | High | 23 | 985.3 ± 22.96 |
| Spring 93 | Angus | Low | 22 | 1026.9 ± 25.30 |
| Spring 93 | P. Hereford | High | 11 | 1062.6 ± 34.74 |
| Spring 93 | P. Hereford | Low | 26 | 994.1 ± 21.37 |
| Spring 94 | Angus | High | 17 | 1150.0 ± 27.68 |
| Spring 94 | Angus | Low | 30 | 1163.7 ± 20.01 |
| Spring 94 | P. Hereford | High | 13 | 1150.9 ± 30.36 |
| Spring 94 | P. Hereford | Low | 23 | 1119.6 ± 22.86 |

^{a,b,c,d} Least squares means for High vs Low were different (P<.05).

Table 4. Condition score least squares means for cows sired by High and Low Milk EPD Angus and Polled Hereford bulls.

| Breed | Level | n | Condition score |
|-------------|-------|-----|-------------------------|
| Angus | High | 98 | 4.88 ± .06 ^a |
| Angus | Low | 100 | 5.26 ± .06 ^b |
| P. Hereford | High | 61 | 4.98 ± .08 |
| P. Hereford | Low | 104 | 5.10 ± .06 |

^{a,b} Least squares means for High vs Low were different (P<.01).