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Relationship of milk expected progeny differences (EPD's) to milk production and calf weaning weight

Abstract

Spring-calving Angus (n=37) and Simmental (n=28) cows were used to evaluate the relationship between milk expected progeny difference (EPD), milk production, total milk energy, and weaning weight. There were positive correlations between milk EPD's and milk produced during lactation, total milk energy per lactation, and calf weaning weight. On average, a 1 lb increase in milk EPD predicted a 1.8 lb increase in calf weaning weight and an increase of 56.6 (Angus) and 70.2 (Simmental) lb in total milk per lactation. Our results suggest that producers can use milk EPD's as selection tools to influence the milk production of their cows and subsequent weaning weights of their calves.

Keywords

Cattlemen's Day, 1989; Kansas Agricultural Experiment Station contribution; no. 89-567-S; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 567; Beef; expected progeny differences (EPD's); Milk production; Calf weaning weight

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Summary

Spring-calving Angus (n=37) and Simmental (n=28) cows were used to evaluate the relationship between milk expected progeny difference (EPD), milk production, total milk energy, and weaning weight. There were positive correlations between milk EPD's and milk produced during lactation, total milk energy per lactation, and calf weaning weight. On average, a 1 lb increase in milk EPD predicted a 1.8 lb increase in calf weaning weight and an increase of 56.6 (Angus) and 70.2 (Simmental) lb in total milk per lactation. Our results suggest that producers can use milk EPD's as selection tools to influence the milk production of their cows and subsequent weaning weights of their calves.

Introduction

Variation in milk production of beef cows accounts for much of the variation in calf weaning weights. Unfortunately, it has been difficult to select for this factor because milk production of beef cows is difficult to measure. Development of Expected Progeny Differences (EPD's) for milk production have provided purebred and commercial breeders with the opportunity to increase selection pressure on milk production. However, many cattle breeders continue to question the validity of milk EPD's. This study was initiated to determine the relationship between milk EPD's and actual milk production and calf weaning weights.

Experimental Procedures

Spring-calving, purebred Angus (n=37) and Simmental (n=28) cows were milked at approximately 60, 120, and 180 days postpartum to establish individual lactation curves. At each milking, the cows and calves were separated for approximately 4 hours, placed together until all calves completed nursing, and separated again. Cows were injected I.M. with 40 I.U. oxytocin to stimulate milk letdown and machine milked 12 hours following this separation. Samples from each milking were analyzed by Kansas Dairy Herd Improvement Association to determine the relationship of milk components (butterfat, protein, lactose, and total solids) to weaning weight and milk EPDs.

Twenty-four hour milk production was estimated by doubling the 12 hour production, after adjusting for time of separation from the calf. Daily milk production values were used to calculate lactation curves, using the procedure described by Schalles and co-workers in the preceding paper. Then, total milk production per lactation was determined from those curves.

Total milk energy per lactation was calculated by multiplying the daily milk production from the lactation curve by the appropriate energy values of protein, butterfat, and lactose.

Calves were born from late February to early April, and the cow/calf pairs were grazed on native bluestem pasture throughout the summer with no creep. Calves were weaned at approximately 205 days of age.

Expected Progeny Differences (EPD's) were provided by the American Angus Association, St. Joseph, MO and the American Simmental Association, Bozeman, MT.

Results and Discussion

Correlations between milk EPD, milk production, milk energy, and weaning weight are presented in Table 2.1. The positive correlation between milk EPD's and milk production indicates that EPD's successfully predict milk production. Similarly, cows with higher milk EPD's produced heavier calves at weaning. Since the total amount of milk produced is the major factor in the total milk energy produced, correlation coefficients of total milk energy with weaning weight and milk EPD with total milk production were almost identical. Correlations between traits were similar for both breeds.

An increase of 1 lb in a cow's milk EPD was related to 1.8 lb (SE=0.7) of additional weaning weight and additional milk production of 56.6 lb in Angus and 70.2 lb in Simmental cows.

In this study, an increase of 26.8 lb of milk produced an additional pound of weaning weight, which is more than in most previous research trials. In conclusion, milk EPD's are good predictors of milk production and consequent weaning weight.

Table 2.1. Relationship between Milk Production, Weaning Weight, Milk EPD, and Total Milk Energy

Comparison	Correlation Coefficient	
	Angus	Simmental
Total Lactation Milk Production and Weaning Weight	.62	.62
Total Lactation Milk Production and Milk EPD	.41	.55
Total Lactation Milk Energy and Weaning Weight	.64	.50
Total Lactation Milk Energy and Milk EPD	.44	.52
Milk EPD and Weaning Weight	.30	.47