

## Cow Weight and Preweaning Performance of Calves

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The influence of cow weight at parturition and during the lactation on preweaning performance of calves was evaluated. Hereford cattle at the Fort Hays Branch Experiment Station were used. Purebred sires had been used many generations in the herd that produced the calves.

The calves were born January through April. Cows and calves grazed native pastures without creep feed. Heifers were bred to produce first calves when about three years old. All male calves were castrated by one month of age. Calves were weighed and identified within 24 hours after birth and were again weighed at weaning. They were weaned between September 15 and November 1, at an average age of 263 days. Cows were weighed immediately following parturition and when the calves were weaned.

Birth weight, preweaning average daily gain (ADG), and weaning weight were available for 619 calves sired by 13 bulls during 6 years.

The data were analyzed by the least squares method, using a multiple classification model with regressions and unequal subclass numbers. It was assumed on the basis of previous analyses that none of the main effects would interact significantly, so interactions were excluded from the model.

The "t-test" was used to isolate differences among subclasses. Correlations among preweaning traits were obtained from data adjusted for average effects of birth weight, weaning weight, and cow weight at parturition.

### Results and Discussion

Average birth weight, preweaning ADG, and weaning weight of 619 calves were 76.0, 1.56, and 483.3 pounds, respectively. Weights of cows at parturition ranged from 850 to 1595 pounds (1149 pounds average). Cows' weights were grouped into 10 classes. Cow weight at parturition significantly influenced birth weight (correlation, 0.26). However, cow weight did not significantly influence preweaning ADG nor weaning weight. The lightest cows produced the lightest calves at birth, but cows weighing 1300 to 1345 pounds at parturition produced the heaviest calves at birth.

Calves from cows weighing 1000 through 1195 pounds at parturition grew faster until weaning than calves from heavier or lighter cows but the difference was not significant. Cow weight did not significantly affect weaning weight of calves, but cows weighing more than 1150 pounds at parturition produced heavier calves at weaning than did lighter cows. Calves from cows weighing 1250 to 1295 pounds at parturition were heaviest at weaning.

Correlations of cow weights with productive years in the herd and with calves produced per year were small and non-significant, indicating essentially no relationship between cow size and reproductive performance.

From parturition to weaning cow weight changes varied from 295 pounds lost to 240 pounds gained. Cow weight changes were grouped into 5 classes. Simple means and standard errors, calculated according to years, showed that years of higher cow weight losses tended to be associated with faster calf growth rates and heavier calves at weaning, but not consistently so.

Cow weight change was significantly related to preweaning ADG and weaning weight of calves. Analyses indicated that cows that gain the least weight during lactation produce faster gaining calves. The difference between preweaning ADG of calves whose mothers lost weight and those whose mothers gained during lactation was highly significant.

The regression of preweaning ADG of calves on ratio of cow-weight change to weight at parturition (percent change in body weight) was  $-0.007$ , or a calf gain of 0.07 pound per day faster for every 10 percent its mother lost of her weight. Perhaps cows that produced more milk had faster gaining calves and lost weight while nursing them.

Influence of cow weight changes on weaning weights of calves was highly significant and similar to the effects on ADG. Widest difference in weaning weights of calves (36.0 pounds) was between calves produced by cows that gained and those by cows that lost weight during the preweaning period.

When the means and standard errors of ratio of cow weight changes to cow weights at parturition were calculated according to cow age groups, 3- and 4 year-old cows lost the

most weight on a percentage basis, and the losses decreased with cow's age. Ratios of cow-weight-change to weight-at-parturition indicated that for each percent loss in body weight of cows, calves were from 0.31 to 2.40 pounds heavier at weaning, depending on age of the cow. The effect on calves was greatest when their mothers were 5 to 7 years old; least when mothers were 4 years old, supporting the belief that mature cows have better mothering ability than either older or younger cows.

The regression of weaning-weight-of-calves on ratio of cow-weight-change to weight-at-parturition (percentage change in body weight) was 1.98, indicating a 1.98 pounds increase in weaning weight of calves for one percent loss of cow weight during preweaning. Analyses by cow-age groups gave similar results.

This study showed that calves from medium size cows (1150 to 1300 lbs.) tended to grow faster and were heavier at weaning than calves from lighter cows, though not significantly so. Cows that gained the least during the lactation produced heaviest calves at weaning, probably because the cows were producing more milk than those that gained more. Younger cows lost a larger percentage of weight during lactation than older cows.