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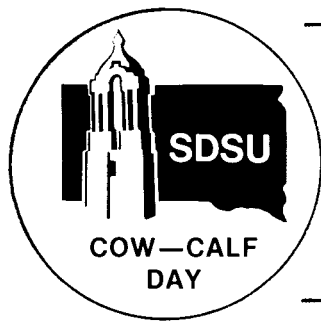
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REPEATABILITY OF COW EFFICIENCY, WEANING WEIGHT AND MILK PRODUCTION

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Summary

Data for this study were collected over the years 1972 through 1979 and comprised 346 and 312 cow year records from drylot and pasture managements, respectively. Experimental animals were Angus, Charolais and the reciprocal crosses of these breeds. Cow efficiency was available only on the individually fed drylot cows and was calculated as the ratio of cow and calf TDN intake to calf weaning weight. Estimated repeatability for cow efficiency in the drylot was .23, for weaning weight, .2 and for total milk production, .47. Repeatability for weaning weight and total milk in the pasture trial was .24 and .58, respectively. Since the repeatabilities for weaning weight are lower than most previously published estimates, it is possible that the conditions of this experiment have likewise lowered the estimate of repeatability for cow efficiency since weaning weight is an integral part of the definition of cow efficiency.

Introduction

The beef cattle industry must continue to improve efficiency of meat production to remain a profitable producer of protein. Previous results of analyses of this project had indicated substantial individual differences in cow efficiency and established that it is economically important to the producer and to the state. Knowledge of repeatability can serve to indicate the upper level of heritability of the trait as well as indicate the extent of influence of temporary environmental effects on this trait.

Materials and Methods

Experimental females were produced in 1970-72 by random selection of straightbred Angus and 75% or higher Charolais cows artificially mated to one Angus or one Charolais sire. At weaning, heifers were randomly allotted to a pasture or drylot management system.

Pasture females grazed on improved pasture during the summer and were wintered on a traditional high roughage ration. Drylot females were individually fed varying amounts of chopped alfalfa hay and sun-cured alfalfa pellets. The amount of feed offered drylot cows was adjusted to simulate weight change of comparable cows on pasture. Cracked corn or ground ear corn was added during lactation for additional energy.

Data for this study were collected over the years 1972 through 1979 and comprised 346 and 312 cow year records from drylot and pasture management, respectively. Individual feeding in the drylot allowed the calculation of cow efficiency which was defined as the ratio of the sum of cow and calf TDN for a year to unadjusted weaning weight of the calf. Milk production data were collected by the weigh-suckle-weigh method.

Results and Conclusions

Results for cow efficiency and weaning weight were similar to those reported by Marshall et al. (1976) and Brown and Dinkel (1982). Cows weaning bull calves were 8.5% more efficient than those weaning heifer calves. Bull calves were 46 lb heavier at weaning than heifers. Cows weaning older calves were more efficient and produced heavier calves. Cows in higher condition at calving were more efficient, while fatter cows at weaning were less efficient. It would appear from this study that cow condition at weaning has a greater effect on cow efficiency than cow condition at calving. This probably means that cows that are putting their energy intake into milk are more efficient than cows that put their energy intake into fat on their own body. Breed group of dam and cow size were not important sources of variation for cow efficiency as previous studies have shown. Cow size did have a small but significant effect on weaning weight.

The estimate of repeatability of cow efficiency is available only in the individually fed drylot data and the estimate obtained was .23. Estimates of the repeatability of weaning weight were .2 and .24 for the drylot and pasture groups, respectively. The repeatability of total milk was estimated as .47 and .58 for the drylot and pasture groups, respectively.

The estimates of repeatability for cow efficiency and weaning weight are somewhat less than the previously reported estimates of repeatability of weaning weight. Since the estimates were low both in the drylot and pasture, it does not appear to be a function of the individual feeding in the drylot or other possible effects of drylot management. A more likely explanation is that these estimates are calculated on a within breed group basis and, since the cows are all half-sibs, the population does not display the genetic variation one would find in the usual beef herd. Since cow efficiency appears to be as repeatable as weaning weight in these data, one might make the somewhat uncertain assumption that the two traits are approximately equal in repeatability, but this will require validation at a later time in the population with greater genetic variation.

The estimates of repeatability for milk production indicate that purebred breeders interested in selecting cows for increased milk production could rely on the first record as a basis for this selection. In beef cattle, this would be a rather slow process and one might want to consider saving bulls from dams with high milk production. Both of these methods have been useful to dairy breeders in making the substantial improvement that they have made in past years.