

SUMMARY REPORTS

Other Research in Progress

Cow-Calf-Stockers

Selection for Increased Growth Performance in Beef Cattle

R. R. Frahm and Glenn Selk

In order to meet the projected increase in consumer demand for beef and to realize a profit in spite of increasing production costs, cattlemen face a tremendous challenge to increase the level of production per cow in the breeding herd. Since the total quantity of beef produced has a direct bearing on realized profits, cattlemen are justifiably concerned about the growth rate of their cattle. Consequently, some measure of growth rate is one of the principle traits utilized in performance testing and selection programs.

The beef cattle selection study initiated in 1964 at the Ft. Reno Livestock Research Station involves both purebred Angus and Hereford cattle. The objective of this study is to determine the direct and correlated genetic responses to selection based on weaning weight and yearling weight, respectively.

The study consists of six selection lines of 50 cows each: two Hereford lines (one selected for increased weaning weight and the other selected for increased yearling weight) and four Angus lines (one selected for increased weaning weight, one selected for increased yearling weight, one selected for increased weaning weight based on progeny test information and one serves as an unselected control line). A more complete experimental design for this study is presented in Okla. Agr. Exp. Sta. Misc. Pub. 85:150.

It is too early in the study to determine the actual rate of genetic improvement resulting from selection. However, it is apparent that thus far in the study no major differences in growth performance as measured by weaning weight or yearling weight have occurred between the weaning weight and yearling weight selection lines within either breed. This

implies that the genetic changes that have occurred thus far for growth performance have been similar in both the weaning weight and yearling weight lines.

Examination of the growth performance of the selected bulls gives some indication of why the weaning weight and yearling weight lines are performing at a similar level. The 10 Hereford bulls selected and used in the weaning weight line during the past five years had an average 205-day weaning weight ratio of 1.17 and a yearling weight ratio of 1.12. The 10 Angus bulls selected in the weaning weight line had an average weaning weight ratio of 1.13 and a yearling weight ratio of 1.08. Although these bulls were selected on the basis of weaning weight performance they also had a higher genetic potential for heavy yearling weight than the average of the line.

The weaning weight and yearling weight ratios for the 10 Hereford bulls selected in the yearling weight line were 1.13 and 1.16, respectively and 1.09 and 1.13, respectively, for the 10 bulls selected in the Angus yearling weight line. Use of any of these 4 sets of bulls would be expected to increase both weaning weight and yearling weight in their respective lines.

Publications

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- Frahm, R. R. 1972. Comparison of young Angus-Holstein crossbred and Angus cow productivity under range conditions. Proc. Tech. Comm. Meeting NC-1 pp. 113.
- Frahm, R. R., D. F. Stephens, Bob Mizzell and Glenn Selk. Selecting breeding stock based on growth performance. Okla. Agr. Exp. Sta. Res. Report P-673:39.
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Comparison of Cow Productivity Among Certain Two-Breed Crosses

R. R. Frahm and Todd Stanforth

Research has clearly demonstrated that crossbreeding among the traditional beef breeds in the U.S. can increase production in terms of pounds of calf weaned per cow exposed for breeding by at least 15 percent. Crossbreeding improves production by providing an opportunity to capitalize on combining the desirable characteristics of two or more breeds and by taking advantage of heterosis.

The amount of heterosis expressed for a particular trait is dependent upon the genetic differences between the breeds involved and the amount of non-additive genetic variation for that trait. Thus, heterosis is expected to be larger, and has generally been found to be larger, for traits with a low heritability such as those traits involved with reproductive efficiency and maternal performance of the cow and early growth rate of the calf. Consequently, the crossbred cow is an essential component of increased production through crossbreeding.

Adequate numbers of straightbred animals of many of the more recently imported breeds are not available to determine the actual level of heterosis resulting from crossing with the more traditional breeds. However, it is possible to compare the level of performance of these crossbreds with existing breeding stock to determine the merit of these imported breeds for total production under management systems that exist in the U.S.

The purpose of this study is to compare lifetime productivity under range conditions of eight different two-breed cross cow groups (Angus-Hereford, Hereford-Angus, Simmental-Angus, Simmental-Hereford, Brown Swiss-Angus, Brown Swiss-Hereford, Jersey-Angus and Jersey-Hereford) when mated to terminal cross sires of a third breed. Each of the eight crossbred cow groups will consist of approximately 45 cows resulting from appropriate matings to comparable sets of Angus and Hereford cows over a three year period.

A foundation herd of approximately 200 Angus and 200 Hereford cows that are typical of good commercial cattle in Oklahoma were assembled at the Lake Carl Blackwell research range near Stillwater and were bred to the respective sire breeds during the 1972 breeding season to produce the first set of crossbred calves during February - April of 1973. Lifetime productivity of each crossbred cow group (approximately 10 calf crops) will be compared when mated to the same set of sires

of a breed other than those involved in the composition of the cows.

Feedlot performance and carcass merit will be measured on the two-breed cross steers as well as on the three-breed cross calves that will be produced by the crossbred cows. Shorthorn and Red Poll bulls will be used to sire the calves produced by the crossbred cows as 2-year-olds. Charolais bulls will be used for the second and subsequent calves until the three different age groups of crossbred cows all reach maturity. At that time one other breed can be introduced in any one year for comparison with Charolais as a terminal cross sire breed.

Data will be collected on reproductive and maternal performance of cows, winter supplementation and total nutritional requirements of cows, growth rate of calves to weaning, and feedlot performance and carcass evaluation of the calves.

Results from this study will provide basic information that will be essential in developing systematic crossbreeding programs utilizing available genetic resources (breeds) that will optimize production under Oklahoma range conditions.

Problems Associated with Induced Superovulation and Superfetation in Beef Cows

E. J. Turman, J. G. MaGee, M. R. Johnson and D. F. Stephens

Previous research carried out as a part of this project has demonstrated that the incidence of multiple births in beef cattle can be greatly increased by the injection of the gonadotropic hormone preparations PMS and HCG. In early studies the PMS injections were given on days 5 and 17 of the estrual cycle timed from a naturally occurring estrus. However, as reported elsewhere in this publication, the PMS injections may be timed from a synchronized estrus.

The HCG injections have been given at, or near, the first post-PMS estrus to insure that all follicles stimulated by the PMS will be ovulated. However, there is some question as to whether there is a need for additional leutinizing hormone, which is the predominant gonadotropic hormone found in HCG. Accordingly, a small study was carried out in the spring of 1971 to test whether this injection was needed.

Thirty-one lactating cows were checked for the occurrence of estrus and injected subcutaneously with 1000 IU PMS on day-5 and 1500 IU PMS on day-17 of the cycle counting the day of estrus as day-0. Following the second PMS injection the cows were placed with fertile bulls. As the cows were observed to be in estrus they were alternately assigned to either receive HCG or not receive HCG. Only 14 of the 31 cows were observed in estrus, therefore, only seven cows were assigned to each group. However, at least seven additional cows were in estrus, but not observed, since they conceived at this estrus, resulting in data in 14 cows not receiving HCG, but on only seven receiving HCG.

Of the seven cows receiving HCG, one conceived at the first post-PMS estrus and produced twins. Of the 14 cows not receiving HCG, 10 conceived and produced 5 singles, 3 sets of twins and 2 sets of triplets. While numbers of animals are too small to permit definite conclusions, these results suggest that the HCG injections are not necessary.

Publications

Turman, E. J., J. G. MaGee and D. F. Stephens. 1972. Weaning more calves per cow. Okla. Agr. Exp. Sta. Res. Rpt. P-673:1.
