

FEEDLOT VS. RANGE PERFORMANCE

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The San Carlos Apache Indian Tribe and The University of Arizona Animal Sciences Department have been cooperating in beef cattle research since 1956. The program involves a 500-head registered Hereford cow herd owned and maintained by the tribe on the San Carlos Apache Indian Reservation. The registered cows observed in the research are maintained as a separate unit on the reservation. Facilities include cattle corrals and working areas, scales, and 20 single-sire breeding pastures.

This cooperative project was included as a part of the Arizona Agricultural Experiment Station contribution to Regional Research Project W-1, the Improvement of Beef Cattle through the Application of Breeding Methods. As a part of this regional effort, some of the participating stations have developed high performance lines of beef cattle selected with use of performance testing procedures. Participating stations agreed to make sires available from these performance-selected inbred lines for use in the San Carlos registered cow herd.

The purpose of the study reported here was to evaluate these inbred lines for economically important traits. The study was also designed to permit a comparison of range and feedlot performance of bull progeny of the test sires. Sires from inbred lines were obtained from Agricultural Experiment

Stations at Montana, Wyoming, Utah and New Mexico. Two lines were represented from the Nevada and Colorado Experiment Stations and from the U.S. Range Livestock Experiment Station, Miles City, Montana. The 10 lines were all of registered Hereford breeding. A different bull was provided from each line during four successive breeding seasons during the 1970s.

The registered Hereford cows and heifers used in the test herd were allotted at random each year within age-of-cow classes. Approximately 30 cows were allotted per sire in single-sire breeding pastures. The breeding season extended from May 1 to August 1.

The general range area is at an altitude of 5,000 feet with range forage consisting primarily of desert grassland vegetation. Annual rainfall averages about 14 inches with most of it occurring during the summer months of July and August. Temperatures may range from -20°F in January to 95°F in July.

The calves were ear tattooed, and individual birth dates and weights were recorded. Pertinent comments concerning information that could affect performance were also noted during the nursing period.

In early November, all cows and calves were brought to the corrals for weaning. The calves were weighed and individually scored for conformation and condition. At weaning, half of the bull calves of each sire group were randomly selected for feedlot performance testing. The remaining bull calves were left on the range.

The bulls and heifers on the range were maintained separately after weaning. Subsequent weights were obtained in the early spring (about

March 1) before the growth of new forage, again in the fall in November and the following spring. Thus, four stages of development were represented with an average age of 235, 340, 600 and 710 days. The herd was maintained on a year-long grazing program with no supplementation.

The feedlot performance test was conducted at the Agricultural Experiment Station at Tucson. The bulls were group fed for a 140-day period. Individual weights were taken at 28-day intervals. The test ration containing approximately 50% concentrates was fed free choice during the four years of the test. Average weights at the beginning and end of the test were 469 lbs. and 893 lbs., respectively. This resulted in an average daily gain of 3.03 lbs. The heritability of gain during this test was 54%.

Half-siblings remaining on the range actually lost weight during the same period. (Bulls, -.29 lb. per day and heifers -.50 lb. per day.) This is a common pattern for unsupplemented range calves in Arizona during their first winter after weaning. During the following growing season (340-600 days of age), gains of the calves on the range were excellent, with bulls averaging 1.43 lbs. per day and heifers 1.40 lbs. per day.

DOES FEEDLOT PERFORMANCE REFLECT RANGE PERFORMANCE?

To evaluate the relationship between feedlot performance and range performance requires a look at the correlation between sire groups on the range and in the feedlot. Using the period of growth for the range calves (approximately 12 to 20 months of age), this correlation for the bulls from the same sire groups was 0.84 (perfect correlation = 1.0). The relationship for the bulls on feed test and their half-sibling heifers on the range was less (0.49),

but still fairly large and positive. These correlations tell us that a feedlot performance test is a good indication of how the same animals would perform on the range, particularly for bull progeny from the same sire. Simply stated, the higher gaining bulls on a feed test should also be the higher gaining bulls under range conditions. Thus, selecting bulls based on a feedlot performance test should result in improvement of gaining ability on the range.

The fact that the correlation or relationship is not perfect would indicate that some change in ranking bulls based on a feed test or range performance would occur. This leads us to the general conclusion that the best way to evaluate replacement animals for their growth potential is to test them under the conditions we expect them to live. However, substantial improvement can be made by selecting bulls based on a feedlot performance test where they can express their maximum ability to gain.

A COMMENT OR TWO

A word of caution. Simply because a bull is "performance tested" doesn't tell us he will improve the gaining ability of calves on the range (or anywhere else). We have to use the performance test information in a logical manner by selecting only those animals that are at the "top of their class" in the performance test. Only through this method can we expect substantially to improve gaining ability of beef cattle on the range.

Finally, any valid comparison of performance must be between animals tested in the same environment. To compare records of performance at one ranch with those from another or between one test station and another would not be valid because of different dates, management and other environmental factors.

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