

MEASURING BEEF PRODUCTION IN THE COW HERD

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Beef cow herds are maintained primarily for reproduction and to convert forages into products useful to man. Conditions under which they are expected to perform vary widely from extensive range lands to intensive systems with seeded pastures and harvested feeds. Herd productivity is expected to vary with these different environmental situations. Although systems and expected levels of production are variable, methods of measuring productivity may be quite constant.

With calf production as the primary goal, productivity in a cow herd is often considered only in terms of number and weight of calves weaned. However, net returns are also influenced by the sale of cull breeding animals. Both must be managed and marketed to advantage.

The mature beef cow is a notoriously poor converter of animal feed to human food. A high proportion of the feed given to any animal is required for the maintenance of that animal. In a beef breeding herd where less than one calf is marketed per cow per year, the portion of feed which is returned as product in the calf is extremely small compared to that required to maintain that calf and to maintain the cow for 12 months. Feed costs for maintenance are a tremendous overhead which the beef herd must carry and should be held to the minimum compatible with efficient production.

Productivity Considerations

a) *Reproduction*

With calf production as the reason for maintaining a cow herd, reproduction clearly has top priority. Any mature cow not nursing and/or carrying a calf should be marketed for beef. Feed costs, capital investment and labor requirements will not justify maintaining her through another calving season. Any other known trait used for selection may have questionable value and lead to a temptation to keep a cow whether reproducing or not. A commercial beef producer cannot afford to favour any one cow regardless of appearance or prior production.

b) *Milk Production*

A question frequently discussed is - how much milk should a beef cow give? Weaning weight of a calf is increased with increased milk production of its dam up to a rather high level. However, extremely high levels of milk production may not be consistent with total feed costs if such milk yields produce thin cows which require special feed and management during the dry period in order to breed back the following year. Conversely, an overly fat cow at weaning time has not produced as much milk as she should. Therefore, a beef cow should give the amount of milk that will leave her in thrifty condition when her calf is weaned and be consistent with the maximum weaning weight of her calf and the year-long feed supply that will hold total feed costs to a minimum. Since feed supplies vary widely, the milk production expected from cow herds managed under different conditions should also vary. It is more efficient to supply supplemental feeds, if needed, directly to the calf than to the cow for the purpose of milk production.

c) *Cow Size and Condition*

No attempt will be made here to review all the literature available on beef cattle size. Although there are significant differences among the numerous sizes and breeds of cattle, these differences are not closely related to efficiency of production (Klosterman, Cahill & Parker, 1968; Klosterman, 1972; Klosterman & Parker, 1976; Dickerson, 1978). Differences in rate of maturing and appetite which exists are of importance in selecting those breeds and sizes best adapted to specific crossbreeding systems, environmental conditions and market demands. Traits of most importance for increasing feed efficiency in beef cattle are feed intake or gain per unit of body weight and the ability to finish at a desirable carcass weight. Those cattle which will produce the most carcass weight of the desired grade at the youngest age will be the most efficient.

Cow weight is determined by frame size and degree of fleshing. Both weight and condition must be taken into

higher quality feed when growth and reproduction are combined. Closer supervision and better management are required than with mature cows. However, if a calf is lost from a two-year old heifer, the producer still has the gain she made as a yearling; whereas, if a calf is lost from a mature cow, her total year's feed requirements are lost.

c) Replacement Rate

An experiment is underway at the Ohio Agricultural Research and Development Center, Wooster, Ohio, U.S.A. to study the effect of replacement rate upon beef, cow-herd productivity (Klosterman, *et al.*, 1979). Four herds at 4 locations are involved.

In 2 herds a Hereford x Angus and in the other 2 a Charolais x Simmental, Criss-Cross breeding system is followed. One herd of each breed cross is bred to calve in the spring and the other to calve in the fall. Within each of the 4 herds, one-half of the cows are replaced at a conventional rate of 20 percent per year. In the other one-half, all heifer calves are retained through the first breeding at approximately 15 months of age. The latter may be referred to as a maximum replacement rate.

General management procedures include good pasture, supplemental feed when needed and palpation for pregnancy. Culling priorities are in the following order: unsound, open, and 205 day, age of dam adjusted weaning weight of calves produced. In the maximum replacement rate groups, two-year olds which have weaned a calf and have been palpated rebred are retained in favor of bred, mature cows with the goal of maximizing total cow and calf gain.

This total experiment was not initiated until 1979. However, the Hereford x Angus crossbred herd bred for spring calving was started on the replacement rate study 2 years earlier. Therefore, weaning data obtained from this herd in October 1980 represented the third year for these procedures. Although these data are only for one year from a small herd, they are presented as an example of the information which may be obtained.

Keeping all heifer calves through first breeding reduces the average age and weight of the females in the herd Table 1. This reduction in average weight increases the number of breeding females that can be maintained on a given feed supply. Two yearling heifers are approximately equal in feed requirements to one mature cow-calf pair. Their combined gain should also equal the weaning weight of one calf and the extra female available for breeding will aid a reproductive problem.

Total gain in the maximum replacement group was 37 percent greater than in the control herd. Gain in a breeding herd is of no value unless it is marketed. The increase in sale weight due to replacement rate was 23 percent. As seen in Table 2, productivity (weight gain/weight maintained) and TDN required per unit of gain were improved approximately one-third by keeping all heifer calves over a three-year period.

The results presented in Tables 1 and 2 are very preliminary and hence not reliable indicators of the benefits which might be realized from increasing replacement rate. Environmental conditions, breed types and management systems would be expected to influence results. However, the increased productivity obtained in this herd was sufficiently large to warrant further research and serious consideration of increasing the normal herd replacement rate.

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