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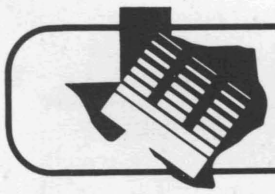

Texas Agricultural Extension Service

People Helping People

SELECTING REPLACEMENT FEMALES: Economically Important Characteristics

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Selection is a process of choosing individuals over others in anticipation of bringing about a favorable change in certain characteristics in a cattle herd. The selection process involves identifying the differences among individuals and keeping those animals that are superior in the traits identified. Selection for genetic improvement in cattle is a lengthy process; therefore, traits of economic value must be identified accurately and selected for diligently. Economically important traits are also referred to as *performance traits*. The major traits influencing total productive efficiency are fertility, mothering ability, rate of gain, efficiency of gain, longevity and carcass merit. Selection of commercial replacement heifers focuses primarily on fertility, mothering ability, rate of gain and longevity.

Fertility

Fertility, or reproductive performance, is basic to an efficient beef cattle operation. The important factor in commercial cow/calf oeprations which affects production costs is the percent calf crop. A high percentage calf crop decreases the demand for replacements and increases the selection differential possible for other traits. Fertility is low in heritability and difficult to measure in heifers. The only way to improve reproductive performance is by culling heifers that reach puberty late or fail to conceive at first breeding.

Mothering Ability

Mothering ability is critical in a productive cow herd. A cow's ability to wean a healthy, vigorous calf is vital for efficient beef production. Reproduction, calving ease, calf survival, maternal behavior and milk production are important components of mothering ability. Because this trait is difficult to distinguish in young heifers, culling should be based on demonstrated performance of the first calf raised.

Growth Rate

Growth rate is highly associated with economy of gain and its relation to fixed costs. Differences in growth rate can be determined objectively by weighing growing cattle at given intervals. Growth rate is the most commonly measured performance trait. It is important to the beef industry, particularly as it relates to weaning weights in cow/calf operations, gains of stocker cattle and performance in the feedlot.

Intense selection pressure on replacement heifers for growth rate without proper consideration of reproductive traits may be counterproductive. Genetic relationships of growth, or size, at different ages (birth weight, weaning weight, 12 - or 18-month weight and mature weight) are quite high.

Selection on the basis of 12- or 18-month weight leads to significant increases in birth weight and mature size. As larger females are selected, their calves' birth weights also increase. Heavy birth weights contribute to calving difficulty, reduced survival of calves and reduced rebreeding performance of cows. Increases in mature weight of cows increases nutrient requirements for maintenance of the cow herd. These factors may offset the advantages of faster gaining and more efficient progeny.

Longevity

Longevity, an animal's productive time in a herd, can be determined partially by subjective evaluation of the replacement heifers. The longer animals remain productive in a herd, the fewer replacements will be needed. This reduces total herd costs of growing out replacements to a productive age. Adverse factors which affect how long a cow is productive in the breeding herd include infertility, unsound feet and

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legs, serious eye diseases, udder trouble and an unsound mouth. Selection for longevity is primarily confined to such indicators as structural soundness and breed or family line history within breeds. Fortunately, there is a certain amount of automatic selection for fertility and longevity. Animals which remain in the herd longer produce more offspring and a larger number of these may be saved for replacements.

Summary

The merits of selection based on performance records (weaning weight, post-weaning growth rate and weight per day of age) are well documented and should be practiced by all purebred breeders and, to the extent feasible, by commercial producers. Most commercial cow/calf producers cannot keep extensive individual performance records and therefore must rely on less accurate methods. Selection of females for increased weight increases genetic growth potential of their calves, but is a poor indicator of reproductive and maternal performance.

Selection is the primary tool available to make genetic change in straightbred herds. The commercial producer has the opportunity to improve efficiency of production and desirability by systematic crossbreeding. In straightbred and crossbred operations, intelligent selection and good judgment must be practiced for consistent improvement.

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