



# SELECTING REPLACEMENT FEMALES: Commercial Heifer Selection

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Selection, as it is used here, encompasses both the direct selection for desirable traits and the indirect effect of improving herds by culling individuals with undesirable characteristics. In the absence of performance records, producers must select animals based on physical appearance. The three primary traits to emphasize when evaluating heifers for use as replacements are fertility, structural soundness and growth. Certain physical characteristics are associated with these traits in high performing cattle.

## Fertility

Fertility, or reproductive performance, is the most important trait in beef cattle production. The primary goal of every cow/calf producer should be to produce a live calf every 12 months from every cow exposed to a bull. Fertility is low in heritability and difficult to recognize in young females. The best approach to improving fertility is to select against obvious structural or reproductive problems and to cull based on reproductive performance.

Visually inspect all heifers for feminine character and size of the vulva. Questionable heifers should be examined by a qualified veterinarian for any internal reproductive tract problems such as infantile tracts; the ovaries should be examined for functional status and estrous cyclicity. Avoid heifers from cows with low milk production, pendulous udders or balloon-shaped teats.

## Structural Soundness

A sound skeletal structure is necessary for the beef animal to remain productive for several years. An animal with good body structure will stand with her legs squarely placed and the toes pointed straight ahead. Minor problems, especially with commercial replacement heifers, can be tolerated, but major ones should be avoided. Problems in the skeletal structure of the hind legs are more serious than those of the front legs. Straight hind legs (post leggedness) can cause more

problems than those with too much "set" to their hocks (sicklehocked). The latter may be unsightly and detract from visual appearance, but only in extreme situations do they result in unsoundness that affects performance or longevity. Overly straight and/or open shoulders and bucked knees are other possible indications of unsound structure.

## Growth

Growth is an important performance trait in beef cattle because rapid and economical gains are essential for profitable production. Research has shown that larger, heavier heifers born earliest in a calving season will generally breed earlier, raise more calves and rebreed sooner after calving. Attention should be given to skeletal size and weight. Without records, the oldest, largest heifers should be retained as replacements. These heifers are from the earlier calving cows that produced optimum milk for a good weaning weight. Such heifers also may have had the genetic ability to continue to grow when they were independent of their dams. All three characteristics--the ability to breed and calve early, the ability to provide a sufficient milk supply for optimum growth, and the ability to grow rapidly--are important in selecting highly productive females.

In a practical production situation, a sequential selection can be made without extra gathering of the herd. At weaning, retain approximately 10 to 20 percent more heifers than are required for actual replacements. Then re-evaluate and cull heifers that do not meet set standards. This should be done prior to breeding, 60 days after removing bulls and again after weaning the first calf.

## Weaning Selection

Weaning selection involves removing any heifers that are structurally unsound, undersized for their age, have a wild disposition or show signs of masculinity or coarseness. For further herd reductions, select the largest heifers of acceptable maturity for the environment and cull the rest.

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## Breeding Age Selection

Breeding age selection consists of removing any heifers that have developed any structural problems since weaning. This is also the opportunity to cull any heifers that are smaller than others in the group because of genetics. For accurate selection at this stage, compare heifers that have been managed alike and are on a nutritional regimen adequate for optimum growth. A guide for adequate heifer growth is that they should have attained 65 percent of their mature body weight before beginning the first breeding season.

## Selection After Breeding

Selection after breeding is based primarily on whether or not heifers are pregnant. The breeding period should be kept short, about 60 days, for selection of early, easy breeding heifers. Open heifers should be sold because their chances of having high lifetime performances are lower than those that are already bred. Avoid purchasing open heifers from a group given the chance to breed.

## Selection Based on Performance

Selection based on first calf performance is the final step in ensuring a high performing cow herd. Identifying pairs (dam/calf) can be difficult, but obviously small, unthrifty calves can be paired with their dams and the pairs culled. Pregnancy checking is another tool for selecting first-calf heifers. It is often difficult to rebreed first-calf heifers because they are still growing and lactating and their reproductive systems require time to prepare for rebreeding. Culling open cows after a specified breeding period will put additional selection pressure on reproductive performance. Economics usually dictates whether or not to sell open first-calf heifers after their calves are weaned.

## Improving by Selection

The single most effective method of improving the cow herd is to select outstanding sires, based on performance records, to use on the cow herd. In most breeding herds, more than 80 percent of the genetic material comes from the last three generations of sires. To enhance the improvement process, replacements should be the best heifers available.

The use of the following simple subjective and objective selection procedures will allow for better decision making and improve the productive capability of commercial cow herds.

1. Identify heifer calves at weaning with an individual hot brand or ear tag number. Each heifer, and eventually every cow, is then identified and should

be viewed as an individual productive unit of the ranching operation.

2. At weaning, cull heifers that are structurally unsound, undersized, display bad temperament or are otherwise undesirable for your operation.
3. Shortly after weaning, weigh each heifer individually under uniform and repeatable weighing conditions. Weaning weight is a combination of the milking ability of the cow and the calf's genetic ability to grow. Both are important characteristics in selecting replacement heifers. The weaning weight is the first measurement of growth rate during the developmental stage. To minimize the possibility of penalizing the fleshier heifers from heavy milking cows, the heifers should be weighed 4 to 6 weeks after weaning. This allows the group to equalize and provides a more valid basis for measuring post-weaning rate of gain. Selection pressure on post-weaning gain alone may foster poor milking ability as thinner heifers at weaning may make compensatory gains during the post-weaning growth period.
4. Manage all heifers alike in the environment in which they are expected to perform. It is preferable to give them access to the better forage and supplement during the winter months. It is not necessary to achieve maximum gain on replacement heifers, but time and environment should be allowed to become part of the performance evaluation process. If nutrition is sufficient to allow individuals to reach their genetic potential for growth, then the differences within the group will be evident. Depending on breed type, daily weight gains of 1.25 to 1.75 pounds are needed during the development period. For most breeds, this rate of gain will promote the onset of puberty and allow heifers to conceive early in the breeding period.
5. Weigh heifers two to three times during the development period and calculate the rate of gain between weighings. If gains are inadequate, increase feed levels. The final weight can be used in ranking heifers according to their gaining ability during the post-weaning development period.
6. Remove any heifers that may develop unsound physical characteristics and those with very low post-weaning growth rate.
7. Expose the remaining heifers to bulls which will minimize calving difficulties. Limit exposure to a 45- to 60-day breeding period.
8. Check all heifers for pregnancy 60 days after the end of the breeding season.
9. Make the final selection from the pregnant heifers. Cull all non-bred heifers.

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Issued in furtherance of Cooperative Extension Work in Agriculture and Home Economics, Acts of Congress of May 8, 1914, as amended, and June 30, 1914, in cooperation with the United States Department of Agriculture. Zerle L. Carpenter, Director, Texas Agriculture Extension Service, The Texas A&M University System.