Beef Herd Improvement: Selecting the Right Replacements

Rickey G. Hudson, Regional Extension Agent

The federal Morrill Land-Grant Acts of 1862 and 1890 allowed for the creation of land-grant institutions in each state to teach agriculture, engineering and military tactics. In 1887, the US Congress provided funding for Agricultural Experiment Stations under the direction of the land-grant institutions. The Smith-Lever Act of 1914 began federal funding of cooperative extension to disseminate research information and knowledge from the land-grant institutions to farmers and homemakers at the county level. The applications of science to agriculture production methods were extremely limited, needed standardization and lacked widespread acceptance before these historical events.

Likewise, at the turn of the 20th century, the use of performance selection criteria in beef cattle herds was almost nonexistent. At the time, a few herds practiced pedigree breeding, but most herds used natural selection, which occurred through “the survival of the fittest.” Land-grant institutions were in an infancy stage, and beef cattle production best management practices still awaited development.

The practice of keeping dairy production records began in the late 19th century. In 1905, the first dairy cow testing program was held in Michigan. In 1927, dairy herd improvement associations were formed; however, beef improvement programs lagged far behind those in the dairy industry. While the Santa Gertrudis breed was developed on the King Ranch in Texas in the 1920s, the first appearance of a beef production records program was at the USDA Station in Miles City, MT in 1936. Much later, several states organized beef cattle improvement associations during the late 1950s. The first of these associations began in 1955 in Virginia.

In Alabama, Auburn University began bull performance testing in 1951. The Auburn University Bull Test was the oldest continuous bull testing program in the nation when it ended in 2007. The Alabama Beef Cattle Improvement Association was founded in 1964 with the goal of beef cattle improvement, hence the name. The Alabama BCIA has led the state beef industry into the modern era of production, with a focus on recordkeeping, performance data collection and standards setting for performance measurements. Currently, the AL BCIA operates a recordkeeping program for commercial members, conducts two performance bull tests (North Alabama Bull Evaluation Center and Wiregrass Forage-Based BCIA Bull Evaluation), and provides educational opportunities through consignment sales and seed-stock workshops.

Today, beef producers enjoy a variety of tools for selecting the right replacements to improve their cow herd genetics. Beef herd production records are often available so that producers can examine an individual animal’s performance. Performance data such as the post-weaning gain of bulls on performance testing programs is also available to compare individual animals against their contemporaries. Individual
carcass data for a live animal is possible with ultrasound scanning. In addition, expected progeny differences (EPDs) are available to compare the expected performance of an individual animal to other individuals across all herds within a breed.

EPDs are currently the single-most valuable selection tool available to beef producers. EPDs offer great flexibility for producers to make single trait selections (maximum or minimum values are chosen for the trait), multiple trait selections (a range of values are chosen for several traits) or index selections (a combination of traits are chosen with an economic weighting of each trait). EPDs are calculated trait values in which comparisons between individual animals from within a breed can be performed, regardless of climate and environmental factors. Moreover, EPDs are the most accurate and reliable tool for predicting the true performance of offspring from potential breeding replacements.

While EPDs are extremely valuable, numerous other considerations are necessary to make the right replacement selections for your herd. Other article sin this issue discuss selecting bulls and heifers and the cost of replacement beef animals. For more information, contact a member of the ACES Animal Science team. Go to www.aces.edu, click on Directory, then Animal Science & Forages, and select your county.

Future selection criteria may evolve from research information gained through DNA testing, gene mapping and allele identification work. Regardless of the source or direction for making improved genetic selections in the future, the key to sustainability and profitability in the beef cattle industry is information and education. Learning is a lifetime process—never stop asking questions.

Herd Bull Selection
Gerry Thompson, Regional Extension Agent, Superintendent, North Alabama Bull Evaluation Center

Agriculture is the largest industry in the state of Alabama, and beef cattle production is one of the largest, most economically important components of that industry. Since Alabama is primarily considered a cow/calf state, it is not hard to understand that the selection and use of good bulls is of tremendous importance to the success of our individual farming operations and to our industry as a whole. Controlling input costs is always an important consideration for farming operations that strive to be profitable, but trying to cut costs by using an inferior bull will almost never be a recipe for success.

It is not hard to understand that the bull you use will be providing half of the genetic makeup of each calf he sires, which in many cases might be 25 to 35 calves per year. In addition, since most farms in Alabama also retain replacement heifers produced on their own farms, the effects of the bulls you have used in the past will be felt for many years to come through the influence of his daughters.

The needs and desires of profitable cattle producers across our state vary widely, so it is no surprise that the types and kinds of herd bulls used also vary widely. Regardless of the particular needs of a particular cattle-farming operation in Alabama, several rules of thumb apply to most situations.

- Take advantage of the benefits of heterosis/hybrid vigor that is a result of implementing a planned crossbreeding program on your farm. With the exception of those producers who are in the business of producing purebred seedstock, almost every beef cattle producer can benefit from using bulls of a breed that compliments the type of cows the bull will be breeding. Research and experience has long since proven that cows resulting from a good crossbreeding program will be more productive, particularly in traits that are hard to measure, such as fertility and longevity. Heterosis is pretty much the only “free lunch” we are given in the cattle industry, and more cattle producers should take advantage of this simple, time-proven technique.

- Choose your cows to match your environment and your bull to match your marketing program. This technique is a little harder to implement for those herds that emphasize retaining replacement heifers from within their own herd, but for those producers who use terminal cross bulls, it is an important component of success.

- Place the most selection pressure on the traits that make the most economic sense for your particular operation. Since most calves in Alabama are sold as feeder calves at weaning time, most people benefit from selecting bulls that have the potential to sire thick, meaty calves that grow quickly before they are weaned.

- Do not overlook the importance of convenience traits. Most people think of these traits as being something like polled or hide color, but probably the most important convenience trait to consider is calving ease.

- Use bulls that are structurally correct. Structural correctness is one of the most important traits that should be considered in herd bull selection—it is also one of the most overlooked and misunderstood components. For a bull to be able to do his job and pass along his other desirable characteristics, he must be able to walk and be able to physically breed a cow. More bulls are culled for feet and leg problems than for any other reason, and having to replace an otherwise desirable bull for structural problems can get expensive. For those herds that retain replacement heifers, using bulls that are structurally sound is even more important.

- Use bulls with good dispositions. This is perhaps the most important consideration in choosing a bull because disposition is a highly heritable trait, and unruly, flighty cattle are not only dangerous to be around but generally lack profitability in any segment of the industry.

Bulls are an indispensable component of most beef cattle operations in Alabama, so selecting a good bull that fits into your individual operation is of great importance. Develop a working relationship with a good, reputable seedstock producer who stands behind his products and provides you with the records and production data you need to make an informed choice. The continued on page 3
BCIA works with seedstock producers so that you can select bulls with complete production records. In addition to several consignment sales throughout the state, the AL BCIA sponsors two bull tests. The North Alabama Bull Evaluation Center features yearling bulls that have been developed in a full-feed environment that allows the bulls to grow to their maximum genetic ability. The Wiregrass Forage-Based Bull Evaluation is located in south Alabama and features older bulls that have been developed primarily on forages. For a complete listing of the bull sales and evaluations that are held in Alabama, visit the BCIA website at www.albcia.com.

## Selecting the Right Replacement Heifers

Anthony Wiggins, Regional Extension Agent

As I was preparing to write this article, I read several articles written by PhDs regarding selecting replacement heifers. Though I often have a tendency to oversimplify things, three themes emerged about replacement heifers: 1) replacements are costly, 2) they should be a genetic improvement to the herd, and 3) the heifer should become a fertile cow that produces a calf annually for a long time. I think most producers would agree with my simplified summarization, but what criteria can producers use to select the right replacement heifers that will offer genetic improvement, annual calf production and longevity for their money?

For a producer to select a replacement heifer that meets all of these criteria, that heifer must first exist. Many tools, strategies and research data are available to assist commercial cattle producers in producing quality replacement heifers that are more likely to be productive in a herd for many years.

Probably the most common selection criterion for commercial cow-calf producers is how the heifer looks. The best looking heifers are the ones that are chosen for replacements. This tends to pick heifers from the earliest calving cows, along with selecting genetics that emphasize growth. Both of these are positive contributions, and in many cases, breed composition and looks are the only selection criteria available to a buyer. While looks are important, using this as a sole means for heifer selection may not ensure selection for fertility and longevity.

One production strategy that can influence longevity is to use a good crossbreeding program. Research has shown for many years how using complimentary breeds can increase maternal heterosis and longevity in cows. Matching a good crossbreeding program and using EPDs to select sires that have desirable traits for size, milking ability and calving ease can also aid in producing replacements that can be successful in a herd.

Evaluating the reproductive tract of a heifer can be used to help determine if a heifer is sexually mature enough for breeding, as well as to detect possible reproductive problems associated with malformed uterine horns and ovaries. In return, this helps in selecting more fertile heifers. The reproductive tract scoring system ranges from 1 to 5, with 1 being a less developed reproductive tract and not yet cycling and a 5 being cycling based on the presence of a corpus luteum or large follicle on the ovaries and good uterine tone. Heifers with scores above 3 generally have higher pregnancy rates and conceive earlier than heifers that have a reproductive tract score of less than 3. Thus, using these scores to select heifers can increase the number of heifers being pregnant at the end of the breeding season, with a higher percentage of the heifers conceiving early in the breeding season.

Generally, the goal for a first calf heifer is to have a live calf and then to get rebred in a timely manner. Taking pelvic measurements and choosing heifers that have adequate pelvic size and culling the heifers with the smallest pelvic measurements can decrease the percentage of assisted births as well as increase the number of live calves born to heifers. Of course, breeding these heifers to bulls known to have low birth weights will also decrease the chances of calving difficulty. Reducing the trauma of calving allows a heifer to be more likely to recover and get rebred in a timely manner, thus increasing her chances of becoming part of the cow herd.

Many other factors should be taken into consideration when it comes to selecting replacement heifers, including environment, nutritional requirements and temperament, to name a few. It will take some time, effort and thought to fully utilize the selection tools mentioned in this article, but by using as much information as possible to select replacement heifers, you will be better equipped to choose a heifer that will become that productive cow that will last in the herd for many years.

## Replacement Economics 101 Program

Henry D. Dorough, CCA, PAS, Regional Extension Agent

When I was asked to author this article about the economics of replacement heifers and bulls, my first reaction was to laugh, which quickly turned into a mild panic. For one, I’m an animal scientist, not an economist, and I did not pay close enough attention in those Ag Econ classes at Auburn too many years ago. However, speaking from a common-sense perspective, every
Max Runge, an ACES agricultural economics specialist, calculates the cost of raising a heifer in Alabama to be more than $1,100, considering the opportunity cost of selling her at 500 pounds in a $1.35 market and the cost to breed, feed and care for her until she calves at 24 to 25 months of age. This would be reflective of a producer with plenty of available forage as the primary feed source. Producers struggling with drought-stressed pastures and hayfields would likely experience a higher cost of heifer production associated with larger feed and labor costs.

Another consideration for replacement heifers is selecting heifers that will provide significant genetic improvement within the herd. Granted, large changes can be made in short order by purchasing a genetically superior bull, but females usually remain in the herd much longer, provided they are not culled for health or reproductive reasons. Therefore, continued improvement in genetics should be a strong consideration when replacing females. A small herd of older females is not as likely to provide large changes in genetic potential through saved heifer calves when compared to purchasing top genetic females through a herd improvement sale.

Prices at recent heifer improvement sales indicate that producers are placing a high value on improving herd genetics through replacement females. The 2011 August Herdbuilder sale in Alabama averaged $1,434 per female, while the 2012 Tifton and Calhoun, GA sales averaged $1,846 and $1,754, respectively. The 2012 Missouri Show Me Select sales have averaged $1,948.

decision made on a cow-calf operation is an economic decision and can be viewed as an investment for future returns. So, with that in mind, let’s take a look at Henry’s rendering on the economics of replacements in a cow-calf operation.

Replacement Heifers

In Anthony Wiggin’s article on selecting the right replacement heifer, he mentioned three important factors: heifers should be fertile and produce a calf annually for many years; heifers should contribute a genetic improvement within the herd; and heifers are costly. The first question producers should ask is whether they want to raise their own replacement heifers or purchase replacements from an improvement program or sale.

The question of raising or purchasing replacement heifers is an age-old topic, and a quick search on the Internet found dozens of popular magazine and journal articles on the subject dating back many years. Texas Extension beef cattle specialist Jason Cleere (Buying vs. Raising Replacement Heifers, TheCattleSite.com, January 2006) noted that the decision to raise replacement heifers involves many factors including opportunity costs, feed costs, conception rates and tax advantages, to name a few. These costs vary from farm to farm, so an accurate budget must be developed for each operation. Cleere concludes that most economic analyses indicate there is a slight advantage to raising heifers as opposed to purchasing them, especially for larger producers who can take advantage of economies of scale to reduce feed and labor costs. Conversely, smaller farms with fewer than 50 cows would be better off purchasing replacements because of feed and labor costs.