E-371
01/06

AgriLIFE EXTENSION
Texas A&M System

Buying Vs. Raising Replacement Heifers

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Should beef cattle producers raise replacement heifers, or buy them? Many pieces of paper have been scribbled on by producers trying to find the right answer. The problem is that no one answer is right for all producers. Each producer operates under conditions unique to that situation.

When deciding on the best strategy for replacing heifers, producers need to weigh the advantages and disadvantages of raising or buying replacement females as well as consider other economic and general management issues specific to their operations. Factors to consider include:

- Current and future market prices
- Herd size
- Pastures, facilities and management level
- Available labor
- Economics
- Herd health concerns
- Cow genetic base (crossbreeding system)
- Herd quality
- Purchase replacement alternatives

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To clarify which strategy is best for a specific operation, producers should develop individualized budgets and management plans for each option.

Current and future market prices

The beef industry is cyclical, with a series of high and low prices occurring about every 10 years. The law of supply and demand governs these cycles. As in other businesses, when supplies are down and demand is steady, prices tend to rise.

When cattle prices are high, producers begin to rebuild their herds by retaining “high value” heifers or by purchasing replacements. The thinking is that with high cattle prices, it is time to get into beef production or to increase current cow inventories. After the rebuilding phase occurs, supplies increase and prices drop. This is the beginning of the herd liquidation phase of the cattle cycle.

Another explanation of the cattle cycle is that cash flow often determines the number of heifers retained or purchased. When prices are low, producers often must sell more or buy

fewer heifers to meet cash flow demands. Conversely, as prices rise, producers are able to sell fewer heifers to meet cash flow demands. Thus, a common joke in the beef industry is "buy high and sell low."

Buying or retaining more replacements when prices are high is contrary to good business principles. Another problem with this practice is that heifers born during periods of high prices will produce calves during the following period of low prices, and vice versa.

To improve cow-calf profitability, producers need to adjust their replacement strategies. A study of replacement strategies by Iowa State University in 2001 examined production and financial data from 1970 to 1999. The strategies that were studied included:

- Maintaining the same number (SS) of heifers each year
- Maintaining the same cash flow (CF) each year—when calf prices are high, the producer retains or buys more heifers
- Retaining the same dollar value (DV) of heifers each year—when calf prices are low, the producer retains more heifers

The researchers found that the return over cash costs for the DV strategy was 55 percent higher than the CF strategy and 33 percent higher than the SS strategy. These findings indicate that it is more profitable to use countercyclical replacement strategies. That is, they should purchase more replacements when calf prices are low. However, producers using a countercyclical strategy must be able to weather large variations in cash flow.

Cycles are affected by changes in consumer demand, environmental conditions that affect production, and other unforeseeable events that can affect the market, such as the cases of bovine spongiform encephalopathy (BSE, or mad cow disease) in Canada and United States. To make informed decisions, the producer must evaluate the current market situation and develop an individualized budget.

Herd size

One of the first issues to address in deciding whether to buy or raise replacements is operation size. Typically, to maintain herd size, a producer must retain about 30 percent of the heifers

in the herd. For a 30-head herd, this means an average over time of five heifers per year.

Is it more economical for a producer to raise these five heifers, or buy replacement females? Usually, small producers find that buying replacements is more cost-efficient because of economies of scale. For this reason, larger producers find that raising replacement females is the more economical choice. However, even some large producers prefer to buy replacements to free up time and resources that could be better used elsewhere.

Pastures, facilities and management level

Young, growing heifers require more management than do cows. The amount of labor associated with heifer development can be substantial and should always be considered in making this financial decision.

To reach the optimal level of maturity for breeding, heifers must be managed separately from the rest of the herd. The higher level of management required for heifers begins when they are weaned. The first 14 to 21 days post weaning requires good management skills and an extra time commitment because of the increased risk of sickness during this period. Also, heifers must be developed carefully to ensure that they reach puberty and can be bred at about 14 to 15 months old.

Because their nutritional needs are different, additional pastures and facilities are necessary to properly wean and develop replacement heifers. Sound holding pens are required to keep heifers contained during the initial weaning period and to keep bulls away before the breeding season.

The extra management does not stop after the bulls are removed. Heifers need to reach 85 to 90 percent of mature weight by the time of calving to ensure high levels of breed back after calving. The development phase of heifers will affect their lifetime productivity. Taking shortcuts in management will affect the value of the female for its entire productive life.

Buying replacements can free up pastures for about 10 percent more cows in an operation. When making your economic analysis, be sure to factor in this additional income.

Need for additional heifers

Another factor to consider is the need to raise more heifers than will be retained. The average conception rate of heifers is 85 percent. Most producers will cull about 20 percent of heifers because of non-reproductive issues such as structure or poor weight gain. Consequently, raising replacement heifers requires keeping about 45 percent more heifers than needed. This ties up capital for an extra 10 to 12 months before the culled heifers are marketed.

When considering whether to raise or buy replacements, remember to factor in the cost of the additional heifers that will need to be kept. The cost adjustment for culling or death loss is shown in Table 1.

Economics

The decision on whether to buy or raise replacement females involves many economic factors. These include opportunity costs, feed costs, interest, labor, facilities, tax advantages, conception rates, replacement costs, bull costs and cull rates.

The cost of raising replacement heifers from weaning to first calf varies from operation to operation, depending on the resources available. As described previously, be sure to factor in your herd size, pastures, facilities, management and feed costs, which are a substantial portion of the total cost of developing heifers. Each producer must develop a budget that accurately reflects the individual operation.

In developing an individualized budget, assign a fair market value for weaned heifers as an opportunity cost. Also factor in the labor costs, which are often omitted in replacement heifer cost analyses.

The sample budget in Table 1 can be used as a guide. To make the most informed decision, substitute the data from your operation and add any extra costs based on your situation.

Assumptions:

1. The value of the retained heifers is for example purposes and will vary.
2. Estimated expenses will vary among producers; to make the most educated decision, you will need to develop your own budget.

Most economic analyses indicate that there is a slight advantage in raising rather than buying replacement heifers, especially for larger producers who can take advantage of economies of scale to reduce feed and labor costs. For the small producer with fewer than 50 cows, buying heifers is usually more economical because of feed and labor costs.

For detailed and interactive cow-calf budgets, see the Texas Cooperative Extension Agricultural Economics Web site at http://agecoext.tamu.edu/budgets/commodity/cow-calf/index.php.

Table 1. Sample budget for raising a replacement heifer from weaning to first calf.

Value of heifer at weaning (500 lb x $1.05)	$525.00
Cost of gain weaning to breeding ($0.45/lb x 250 lb)	$112.50
Cost of bull service	$35.00
Interest	$30.00
Management	$50.00
Grazing and feeding cost to calving	$150.00
Vet costs	$20.00
Cost adjustment for culls and death	$75.00
Total	**$997.50**

Herd health concerns

One reason producers choose to raise their own replacement females is to help prevent diseases from being introduced into their herds. Buying cattle from outside sources always carries a risk of introducing diseases into a herd. This is a valid issue because herd health affects profitability.

Taking action to prevent the introduction of disease-causing agents into a herd is called biosecurity. In cattle operations, the highest level of biosecurity is to maintain a closed herd. The lowest level is to introduce animals of unknown health without a quarantine period.

To minimize the risk of introducing disease when buying cattle:

- Buy only cattle that have clean health records and that are from reliable sources. Consult a local veterinarian about the health requirements that purchased females should meet.
- Quarantine new cattle.
- Maintain a sound vaccination program.

Cow genetic base

The U.S. beef industry has changed dramatically in the past 15 years and will continue to do so to satisfy consumer demands for consistent, high-quality beef products. To meet these demands, the industry is shifting toward a production system based on quality.

In the beef industry, quality begins with genetics. In making replacement female selections, cow-calf producers must realize that a cow's genetics can affect herd profitability for 8 to 14 years.

Raising replacement heifers allows producers to use genetic selection criteria to improve production and management. The producer can select cattle for maternal traits, performance traits or carcass traits for sires of heifers.

A major advantage of raising replacements is the opportunity to select heifers that are born in the first 60 days of the calving season and that are heavier at weaning. These heifers are more likely to reach the proper weight needed for onset of puberty. Also, these older heifers are usually from the most fertile dams that conceived early in the breeding season.

Raising replacement females also allows producers to cull those females that fail to conceive. Field trials in eight Texas herds in 2000 demonstrated that open heifers held over for a second breeding 6 months after first breeding had average pregnancy rates of 58 percent. In another study that year, calving data from five Texas commercial herds (1,500 calving events) was evaluated. This research found that the average lifetime calf weight was highest in females whose first calving date as a heifer occurred the first 21 days of calving.

This does not mean that buying replacement females is not an option for selecting the most fertile and productive females. There are many good replacement female sources that implement strict selection criteria and provide quality genetics. You may want to choose outside sources for replacement heifers if you want to improve the genetics of your herd quickly or if your herd's genetic selection is limited due to heavy culling because of drought or age.

Crossbreeding systems

When cattle are crossbred, the resulting offspring are often more vigorous or fast-growing than are the parents. This improvement from crossbreeding is called heterosis.

Research has shown that heterosis effects can increase production per cow by about 20 to 25 percent in *Bos taurus x Bos taurus* crosses (example: Angus x Hereford) and by 40 to 50 percent in *Bos indicus x Bos taurus* crosses (example: Brahman x Hereford). Most commercial beef producers use crossbreeding to take advantage of heterosis and genetic improvement from combining breeds with different characteristics.

For more information on crossbreeding, see *Texas Adapted Genetic Strategies,* a series of 10 Texas Cooperative Extension publications available at http://tcebookstore.org.

Another goal for producers is to select cattle that are genetically adapted to the local environment. A producer should match the cow to the environment and then use a bull that complements the cow to produce a calf to fit a specific market. But if the appropriate cow and bull are genetically different, a terminal cross is required. A terminal cross can be defined as a mating that produces progeny that are not suitable as replacement animals. Ultimately, producers strive for excellent maternal traits, longevity and efficiency in a cow that will produce a marketable calf.

In the southern United States, producers should choose cattle that are genetically adapted to hot, humid climates. Crossbred females with a combination of *Bos indicus* (typically Brahman) and *Bos taurus* genetics have become the female base for producers in the South. Producers often use *Bos taurus* terminal sires on *Bos indicus* cross females to maximize growth and performance, improve carcass quality and/or decrease the amount of "*Bos indicus* appearance" in the calves. However, when a terminal crossbreeding system is used, the daughters may not be as maternally oriented or environmentally adapted as their dams and are usually not kept as replacements.

The alternative is to use a continuous crossbreeding system that may not maximize growth, performance or carcass quality of the calves but will produce good-quality, marketable calves and females for replacement that are at least as productive as their dams. Producers must decide whether to give up some growth, performance and possibly carcass traits to raise their own replacements or opt to maximize calf performance and buy replacements.

This issue should be factored into the cost analysis. Larger producers can operate a split-herd design in which one group of cows is designated to produce replacement females and the other group is placed in a terminal system or rotational crossbreeding system.

Calving difficulty

Studies at the University of Nebraska Meat Animal Research Center and Colorado State University indicate that 2-year-old first-calf heifers are three to four times more likely to have calving difficulties (dystocia) than are 3-year-old cows. The two major causes of dystocia in heifers are small pelvic area in underdeveloped heifers and heavy calf birth weights. Heavy birth weights are most commonly attributed to genetics of the sire and can be reduced by using low-birth-weight or calving-ease sires on heifers.

A major concern when buying heifers is whether they are bred to a calving-ease bull. Producers raising their own replacement heifers decide which bull to use and so have more assurance that the heifers are bred to a calving-ease bull. Buying replacements from a reputable source can help reduce this concern.

The use of calving-ease bulls on heifers does not a guarantee a dystocia-free calving season. Calving problems can also occur because the heifers have not reached full maturity at calving, because the heifers lack calving experience, or because of improper calf presentation. Thus, producers without the ability, facilities or time to calve heifers may choose to buy second-calf heifers or cows.

Conclusion

Decisions on replacing females play an important role in the future profitability of the cow herd and should be considered carefully. Producers should address both economic and general management considerations when deciding whether to raise or purchase replacements. Always base your decisions on the circumstances of your individual operation.

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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. Edward G. Smith, Director, Texas AgriLife Extension Service, Texas A&M System.