

Evaluating Replacement Female Alternatives

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Ranchers should consider every alternative that fits their operation each year.

Selection of replacement females can be one of the most frustrating and risky management decisions ranchers make. Small errors in estimations of production potential, future prices, and annual costs can cause long-lasting financial hardship. To effectively evaluate alternatives, all available strategies must be considered. An objective approach to evaluation of alternatives and their potential contribution to production efficiency and financial sustainability is essential.

Under normal conditions the most common female replacement decision is whether to retain raised heifers or purchase replacement females from outside the herd. The decision to retain heifers is normally based on known price and availability of quality females, perceived or real advantages in genetic and production potential, and the total costs of developing retained heifers. Additional considerations should be given to herd biosecurity and the predictability of production potential when making the decision to buy versus retain ownership of heifers.

Other situations where the purchase of females commonly occurs are during initial stocking of an operation or restocking following drought or financially necessary herd reductions. In these situations, the availability of quality replacement heifers from the existing herd is insufficient to meet immediate stocking demand. Often the situation exists where a ranch realizes that its current genetic base, although predictable, is not capable of producing enough genetically superior females. Therefore, it may be quicker and less expensive to purchase the desired genetics than to change the genetic base of the herd through alterations in the breeding program.

Once the decision to purchase replacements has been made, there are 15 alternatives to consider. Each is listed below with a brief description.

1. Heifers less than 700 pounds—Open heifers that require development and breeding for their first calf.
2. Heifers more than 700 pounds—Open that heifers require breeding for their first calf.
3. Bred heifers—Heifers that are palpated pregnant.
4. First-calf pairs—Heifers with their first nursing calf at their side that are not exposed for rebreeding.
5. Three-in-ones (2 years old)—Heifers with their first calf at their side that are bred safely for a second calf.
6. Bred cows (3 to 6 years old)—Cows that are palpated pregnant.
7. Pairs (3 to 6 years old)—Cows with a nursing calf at their side that are not exposed for rebreeding.

8. Three-in-one's (3 to 6 years old)—Cows with a nursing calf at their side that are bred safely for the next calf.
9. Bred cows (7 years old or older)—Aged cows that are palpated pregnant.
10. Pairs (7 years or older)—Cows with a nursing calf at their side that are not exposed for rebreeding.
11. Three-in-ones (7 years or older)—Cows with a nursing calf at their side that are bred safely for the next calf.
12. Opens (2 years old)—Young females, which may or may not have had a calf.
13. Opens (3 to 6 years old)—Cows in good condition that are not bred.
14. Opens (7 years or older)—Cows in good condition that are not bred.
15. Stocker cows—Thin cows that are of unknown pregnancy or age.

Each operation may identify additional alternatives or eliminate choices to fit its individual circumstances. In addition to selecting the alternatives, there are at least 11 genetic, economic, and management factors to consider within each alternative (Table 1).

Availability of quantity and quality

Within a similar production environment, determine if enough target-quality females are available within each alternative to warrant consideration. If not, determine the cost of additional sources for adequate supplies. Environmental adaptability should be considered when broadening the search for replacements. Lower the expectations for production potential if replacements are not adapted to the environment where they will be managed.

Often there are mismatches of quantity and quality. There may be an adequate supply of heifers (alternatives 1 to 3) with undesirable quality. Very good pairs (4, 7, and 10) may be available in limited numbers. After supplies are identified, cost calculations can begin.

Initial investment expense

The initial investment expense is the total cost for each available alternative delivered to your operation. Consider all costs including travel, commission, trucking, inspection fees, processing fees, permits, health certificates, and the actual purchase price.

When considering the 15 alternatives, the classes with the greatest initial investment would normally be pairs (4, 7, and 10) and three-in-one packages (5, 8, and 11), particularly in the younger-aged classes. Bred females (3, 6, and 9) can normally be purchased at moderate prices. One exception might be bred heifers (3) of perceived excellent quality, which would result in high prices.

The lowest initial cost would normally be associated with young open heifers (1 and 2) or older open cows (14). Open 3- to 6-year-olds (13) would be considered in the low to moderate range. They are rarely a viable economic alternative unless the origin and culling circumstances are known.

Table 1. Summary of 16 Female Replacement Alternatives and 11 Genetic, Economic and Management Factors for Each¹

	Q/Q Avail	Initial Invest.	Devel. Phase	Rebrd. Potent.	Market Flex.	Genetic Potent.	Potent. Long.	Dyst/ Death	Wean Wts.	Nutrtn. Reqts.	Cull Rate
Retain Heifers	H	M/H	Long	M	H	H	H	M	M	H	M
1) Heifers < than 700 pounds	H	L	Long	L	H	L	H	H	L	H	H
2) Heifers > than 700 pounds	H	L	M	L	H	M	H	H	L	H	H
3) Bred heifers	M	M/H	None	L	L	M	H	H	L	H	H
4) First calf pairs	M	H	None	L	L	M	H	H	L/M	H	H
5) Three-in-ones, 2 years old	L	H	None	L/H	L	M	H	M	M	H	M
6) Bred cows, 3 to 6 years old	L	M/H	None	M/H	L	M	M/H	L	H	L	L/M
7) Pairs, 3 to 6 years old	L	H	None	M/H	L	M	M	L	H	L	L/M
8) Three-in ones, 3 to 6 years old	L	H	None	H	L	M	M	L	H	L	L/M
9) Bred cows, 7 years or older	M	M	None	M	L	M	L	L	M/H	L	M/H
10) Pairs, 7 years or older	M	M/H	None	M	L	M	L	L	M/H	L	M/H
11) Three-in-one, 7 years or older	M	H	None	M	L	M	L	L	M/H	L	M/H
12) Open, 2 year olds	L/M	L/M	M	M	L	M	H	M	M	M	M
13) Open, 3 to 6 year olds	L	L/M	M	H	M	M	L	L	H	L	M
14) Open, 7 years or older	M	L	M	M	M	M	L	L	M/H	L	M/H
15) Stocker cows	H	L	M	L	M	M	L	M	L	M	H

¹ Unless otherwise stated H=High, M=Moderate and L=Low

Development phase

Considering the development phase is critical. The development phase, as far as this evaluation is considered, is from the time an open, non-lactating animal (1, 2, 12, 13, and 14) is purchased until it is palpated pregnant for the first time. Any development phase adds to the cost of an animal and increases the reproduction risk (the risk of her not breeding, calving, and weaning a calf).

If the development costs are considered, purchasing a higher valued package with no development phase may be more economical. Bred, pairs, and three-in-one alternatives (3 through 11) have greater initial investment cost, but no development phase cost. Replacements with a moderate development phase are open females ready to be exposed for breeding. Females with a long development phase are those in any open class that require time to grow or regain body condition in order to be bred.

Rebreeding potential

The single greatest risk factor after purchases are females that fail to rebreed. Any purchased female under 3 years of age (1 through 5) should be assumed to have a lower rebreeding potential. If conception rates are expected to be lower than 90 percent, the potential rating should be considered low. Thin cows would also be considered a high risk for low rebreeding rates.

Cows that have already gone through their second successful breeding can be considered at least a moderate potential for rebreeding. Those that might be considered moderate to high would be the 3- to 6-year-old group (6, 7, 8, and 13).

Flexibility in marketing of extras or culls

Flexibility in marketing is rarely considered in most evaluations. However, it makes a significant difference in the actual cost of cattle left in inventory. If the extras or culls can be sold for a profit, it decreases the true cost of those remaining in the herd. If the extras or culls are sold for a loss, the expense needs to be allocated to those remaining in order to arrive at their true purchase cost.

This consideration has significant differences within and among classes. Young open heifers (1 and 2) have greater resale potential and marketing flexibility than any other class. Those that don't breed can be marketed as feeders or retained through the feedlot. Extra bred heifers can usually be marketed as replacements with increased profit potential.

Nearly all other classes have limited marketing flexibility. Bred cattle that lose a pregnancy or a calf prior to weaning can rarely be disposed of profitably. The loss potential is high. For example, a set of 100 heifers (3) is purchased short-bred (two to three months). Expected pregnancy loss is around 2 %. Calf-death loss at calving averages between 2 and 3 percent in heifers. Death loss in heifers is normally 1 to 2 percent. Calf loss from birth to weaning is usually 2 percent. Rebreeding rates on first calf heifers being exposed for their second pregnancy may be as low as 50 percent or as high as 90 percent. For comparison's sake, use an average conception rate of 75 percent on purchased bred heifers of unknown genetic background.

In this example, only 94 will wean a calf (2 percent pregnancy loss, 2 percent calf-death loss, and 2 percent calf loss from birth to weaning). Two heifers die at calving and only 74 rebreed (98 head x 75 percent).

Assume the heifers were purchased bred for \$1,800 dollars. Monetary losses include:

Death loss (2 @ \$1,800)	\$3,600
Lost income due to calf loss; (6 @ \$1250)	\$7,500
Loss on sale of opens (24 x (\$1800 - \$1200))	\$14,400
Total Loss	\$25,500
Average loss per remaining heifer (\$25,500 / 74)	\$345

The true cost of 74 heifers is \$ 2,145. This does not include vet bills, medicine, feed, labor, interest, or opportunity cost. If pairs could have been purchased for less than the total cost, they should have been seriously considered. Do not get locked into traditional approaches or sources. Consider all options.

Predictability of genetic potential

A primary reason to retain heifers is the predictability of their production potential. When purchasing cattle of unknown origin, predicting their genetic potential is difficult. When purchasing cattle already in production, whether it be as bred or pairs (3, 4, 6, 7, 9 and 10), it can be assumed that they are at least capable of conceiving and delivering a calf.

On the other end of the spectrum is the purchase of lightweight heifers (1). Their ability to gain weight, cycle, conceive, and deliver is unknown, not to mention their ability to rebreed, maintain body condition, and milk sufficiently to wean an acceptable calf. Three-in-one packages (5, 8, and 11) are the only class that gives any indication of their total production capabilities.

Purchasing cattle from a known source over an extended period of time can also help in achieving some level of predictability. These relationships should be sought when the decision to purchase replacement heifers is made.

Potential longevity

The potential for longevity in the herd is an important consideration in purchasing decisions. Current economic analyses indicate that females with a \$1,000 purchase cost will have a five- to seven-year payout. Potential longevity is difficult to predict in cattle from an unknown origin. The longer a female stays in the herd, the greater the opportunity for her to be profitable.

The greatest potential for longevity is in younger females. However, younger cattle (1 through 5) also have the greatest chance of not rebreeding or not weaning a calf, increasing their probability of being culled. The classes with the least potential longevity are the 7 years and older females (9, 10, 11, and 14). If purchased, these females will not remain in the herd for an extended period of time. As such, their purchase value must be nearer to their cull value than in the case of purchasing younger cattle. Moderate longevity is expected in 3- to 6-year-old cows (6 through 8). Similar to genetic potential, ranchers must know why these cattle are being sold.

Dystocia/death loss

Heifers purchased with an unknown genetic background or calf sire should be considered to have a greater risk of dystocia and death loss. Older cows (6 through 15) can normally deliver without trouble. One exception might be small cows bred to high-birth-weight bulls. Stocker cows should be considered at moderate risk of experiencing dystocia or death when calved out after grazing lush pastures in the last trimester of pregnancy.

Weaning weight of first calf

Weaning weights should be considered light for most heifers (1 through 5) and 3-year-olds when compared to cows. Any females bred to unknown sires or having unknown milking ability

should not be considered more than moderate quality. Take into account death losses as discussed earlier when projecting average weaning weights and actual head weaned. In addition, lower weaning weights would be expected from thin-condition cows. Calf weaning weights can be up to 60 pounds lower for each Body Condition Score below 5 (average flesh).

Nutritional requirements

Rarely is this adequately considered when budgeting for replacement female purchases. Requirements for quality pastures and supplements will be highest in younger classes (1 through 5), especially first-calf heifers on through their third pregnancy. The additional requirements through the third pregnancy must be budgeted. Moderate levels of nutrients will be needed for open 2-year-olds (2) and stocker cows (15). Most other classes can be considered low except when purchased in a thin condition. Requirements in this situation may range from high to moderate depending upon the amount of time until their next breeding season.

Cull rate

Cull rates will be highest for cattle under three years of age (1 through 5 and 12) and stocker cows (15). Normally, the lowest cull rates would be for mid-aged cows (6, 7, 8, and 13) and moderate rates for cows more than 7 years of age (9, 10, 11, and 14). Cull rates are one of the most difficult numbers to estimate in a budget.

Most projections grossly underestimate cull rates of purchased females. In most cases, only 50 to 60 percent of the cattle purchased will remain in the herd after three production years. Initial cull rates of 25 to 30 percent should be expected in the first year. This will include cows culled for failing to rebreed, poor udders, structural unsoundness, health-related problems, disposition, and any possible death loss.

Cull rates of 15 to 20 percent should be expected in the second year. In some cases, cows that should have been sold for poor performance will be held for this second year, ultimately lowering weaning weights again. Structure, udder, and rebreeding considerations will remove the majority of these cows in the second year. By the third year, normal cull rates of 10 to 15 percent for rebreeding are expected. In the case of older purchased females, age becomes a factor.

Summary

There is no easy answer to the question of which replacement alternative should be chosen. Carefully consider all of the factors mentioned above and build a three-year budget projection for each alternative. This gives the females the opportunity to achieve a “static” production level. Static production is defined as the point in a female's life where her production risk and potential are comparable to the remaining mature females in the herd.

Budgets need to be developed until all cattle are palpated pregnant for at least the third time following purchase. This will allow for the inclusion of all the culling factors discussed as well as reduced weaning weights on the first two weaned calves.

In addition to carrying this plan through to the third pregnancy, the budget analysis for any development phase must be completed as accurately as possible. A true reflection of accumulated cost is a must if this type of alternative evaluation is to be successful.

Careful consideration of alternatives and evaluations of all factors in the decision process are critical for a sound budget projection for replacement females. Due to its complexity, this is not an easily managed problem. Table 1 summarizes each alternative and their considerations. Consult with others who have gone through similar scenarios. Capitalize on their experience and rely on sound professional advice.

Do not get locked into one option. Consider each alternative that could fit your operation every year. Market changes may affect the most feasible scenario from year to year. Once the budget process is in place, quick analyses of options are possible.

Do not hesitate to purchase a seemingly expensive alternative up front if it has the greatest potential for long-term economic benefit. Likewise, do not purchase expensive alternatives when they clearly will not produce the desired economic returns and sustainability of the ranching enterprise.