



# Developing Beef Cattle Breeding Objectives

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Breeding objectives serve as a genetic business plan for a beef operation, outlining the goals that a farmer or rancher sets for their cattle operation through genetic practices. Any beef operation that involves mating cattle, whether commercial cow/calf or seedstock, should establish breeding objectives and plan matings with these goals in mind. The purpose of a breeding plan is to breed the "best bull" to the "best cows," where "best" is defined specifically for each operation. Ultimately, breeding objectives impact various aspects of the operation including increased profitability, improved safety, and reduced environmental impact.

## Why Develop Breeding Objectives?

**Targeted Improvement:** Breeding objectives help producers identify traits that affect profitability and determine the economic significance of each trait. This allows for a focused approach to improving specific areas of the operation, rather than making broad, non-specific changes.

**Measurable Goals:** By setting specific, measurable, and attainable breeding goals, producers can track their progress and gain the desired level of change. This focus on measurable outcomes helps to ensure that the goals are not too vague to be attainable.

**Resource Alignment:** Breeding objectives must align with resource availability, especially nutrition, to optimize herd performance.

If the genetic potential of a herd is high but nutrition is limited, the cow herd will have difficulty maintaining condition and reproductive rates can be reduced.

**Market Alignment:** Breeding objectives should reflect how the cattle will be marketed, whether at weaning or through the feedlot. Different marketing endpoints require emphasis on different traits to improve profitability. The time of marketing (weaning, pre-conditioned, yearling, finished) and the pricing systems should also be considered.

**Profitability:** The main goal of most beef operations is profitability, and breeding objectives should target the factors of profitability that are influenced by genetics. This includes both income and expense factors. For example, selection practices to maximize growth can increase income but may also increase the mature weight of replacement females, which increases costs.

**Operational Efficiency:** Breeding objectives should consider management and available resources, including labor. For example, part-time farmers/ranchers may not have as much time to monitor heifers during the calving season and therefore would need to place a higher emphasis on Calving Ease than a full-time producer.

**Adaptability:** While it's important to have goals and targets, it's also important to be flexible because situations like drought or market changes may require re-evaluation of cattle marketing plans.

## Key Considerations When Developing Breeding Objectives (Table 1)

**Trait Identification:** Identify the traits that affect profitability within your operation and determine how significant each one is. These traits will depend on how animals are marketed and whether replacement heifers are retained.

**Desired Improvement:** State the desired level of improvement for each trait and the timeframe for achieving it. Remember, genetic changes in cattle are generally slow.

**Resource Availability:** Evaluate your available resources and identify traits that may be impacted by resource limitations. Feed availability and quality is often a limiting resource for operations. Selection of traits beyond what resources can support could have a negative impact on herd performance, or drastically increase input cost ultimately reducing profitability.

**Marketing Strategies:** Determine how the cattle will likely be marketed, as this greatly influences the traits that are relevant and the degree to which they impact profitability. For instance, if cattle are sold at weaning, then carcass traits will have a limited impact on the selection decision.

### Specific Breeding Objectives Based on Operation Type

#### Seedstock Operations:

**Customer Focus:** The primary breeding objective of seedstock operations should be based on the needs of their bull-buying customers.

**Targeted Genetics:** Seedstock producers should consider the geographical area where they market their bulls to establish the breeding objectives suitable to that environment.

**Marketing Alignment:** Consider how customers market their calves to determine which traits are important. For example, if customers market cattle on the rail, improved carcass traits would likely be important.

## Commercial Cow/Calf Operations:

**Environment and Management:** Breeding objectives should reflect the environment and management where the calves are raised.

**Profitability Drivers:** Focus on the factors of profitability that are influenced by genetics, balancing income and expense.

**Crossbreeding:** Consider a crossbreeding system to take advantage of heterosis and breed complementarity (<https://beef-cattle.extension.org/crossbreeding-for-the-commercial-beef-producer/>).

**Bull Selection:** Select bulls that match resources, management practices, and market opportunities.

## Conclusion

Developing clear breeding objectives is critical for beef farmers to improve efficiency, profitability, and overall sustainability of their operations. By setting specific, measurable, and attainable goals, farmers can make informed decisions that align with their resources, management practices, and marketing strategies.

The breeding program of seedstock producers should be to provide customers with cattle that fit their operations and production goals. Ultimately, targeted selection is essential for the efficient production of beef.

It is recommended that breeding objectives be written out and posted to provide a roadmap for owners, managers and employees; involving everyone in this process will create buy-in and improve the likelihood of success.



**Table 1.** Examples of Some Common Breeding Objective Traits

<b>Breeding Objective Trait</b>	<b>Actions Needed to Meet the Objective<sup>1</sup></b>
<b>Reduce dystocia (calving problems)</b>	<ol style="list-style-type: none"> <li>1. Consider a breed of bull with improved calving ease</li> <li>2. Select bulls with higher Calving Ease Direct EPD – avoid using this EPD in combination with actual measurements, BW EPD and/or visual assessment, this will reduce effectiveness of reducing dystocia</li> <li>3. If retaining daughters, you should also select for higher Calving Ease Maternal EPD</li> </ol>
<b>Improve reproductive performance</b>	<ol style="list-style-type: none"> <li>1. Implement/Improve crossbreeding system (commercial)</li> <li>2. If heifers are retained, select bulls with higher reproduction EPDs - Heifer Pregnancy EPD, Stayability EPD, Sustained Cow Fertility EPD, Preg30 EPD</li> <li>3. Consider selecting bulls based on an index that includes reproductive traits along with other traits to help meet those goals simultaneously</li> <li>4. Select herd bulls with large scrotal circumference to ensure adequate serving capacity</li> </ol>
<b>Improve longevity of the cow herd</b>	<ol style="list-style-type: none"> <li>1. Implement/Improve crossbreeding system (commercial)</li> <li>2. If heifers are retained, select bulls with higher Stayability EPD or Sustained Cow Fertility EPD</li> <li>3. Select for improved udder quality when available</li> <li>4. Select for improved structure; including Claw and Angle EPD</li> </ol>
<b>Increased weight of marketed calves</b>	<ol style="list-style-type: none"> <li>1. Implement/Improve crossbreeding (commercial)</li> <li>2. Select bulls with higher EPD for the weight traits that best fits your marketing endpoint (i.e. Yearling Weight EPD for increased weights of backgrounded calves)</li> </ol>
<b>Improve feedlot performance when finishing calves</b>	<ol style="list-style-type: none"> <li>1. Consider selecting for improved feed efficiency EPD, such as RADG, combined with good growth traits (YW, CW)</li> <li>2. Select bulls with lower DMI EPD combined with good growth traits (YW, CW)</li> <li>3. Consider using an index that fits with your management and marketing philosophy</li> </ol>
<b>Improved carcass traits for marketing finished cattle on the rail</b>	<ol style="list-style-type: none"> <li>1. Select bulls with higher carcass quality traits (Marbling, IMF EPD) and/or improved carcass yield (lower Backfat, higher Ribeye, lower Yield Grade EPD)</li> <li>2. Select bulls with higher EPD for Carcass Weight being cautious not to exceed weights that will result in “Overweight” discounts – Caution: if retaining replacement heifers mature cow weight should be monitored</li> <li>3. Consider using a selection index that is based on marketing cattle on the rail</li> </ol>





Breeding Objective Trait	Actions Needed to Meet the Objective <sup>1</sup>
<b>Lower maintenance costs of cow herd<sup>2</sup></b>	<ol style="list-style-type: none"> <li>1. Moderate mature size of the cows through selecting bulls with lower Mature Weight EPD when retaining replacement heifers<sup>2</sup></li> <li>2. If Mature Weight EPD is not available consider moderating a correlated trait such as Carcass Weight EPD – Caution: if your marketing endpoint is carcasses, this can reduce revenue</li> <li>3. Moderate milking ability of cow herd through selecting bulls with lower Milk EPD when retaining replacement heifers<sup>3</sup></li> </ol>
<b>Produce no horned calves</b>	<ol style="list-style-type: none"> <li>1. If you have any females that are potentially horn allele carriers, then only use homozygous polled bulls</li> </ol>
<b>Produce a certain coat color</b>	<ol style="list-style-type: none"> <li>1. If you desire to produce only black calves and you have any females that are potentially red allele carriers, then only use homozygous black bulls</li> <li>2. If you desire all red calves then you must use both homozygous red females and breed to homozygous red males</li> <li>3. If you desire to produce smoky/grey/off-white calves then some percentage of Charolais breeding should be in the herd</li> </ol>
<b>Maximize safety of workers</b>	<ol style="list-style-type: none"> <li>1. Select bulls with higher Docility EPD<sup>4</sup></li> </ol>
<b>Improved adaptability</b>	<ol style="list-style-type: none"> <li>1. If replacements will be located in higher elevations, consider selecting for lower Pulmonary Arterial Pressure EPD</li> <li>2. If in heat stress regions or replacements will be grazing endophyte infected fescue, consider selecting for lower Hair Shed EPD, introduce the slick gene or consider breeds with Brahman influence</li> </ol>
<b>Improve structural soundness</b>	<ol style="list-style-type: none"> <li>1. Select bulls with lower Claw Set and/or Foot Angle EPD</li> <li>2. Visually appraise bulls for structural soundness and select bulls that are functionally sound</li> </ol>
<b>Improve scrotal circumference of seedstock bull calves for improved serving capacity</b>	<ol style="list-style-type: none"> <li>1. Select sires with higher Scrotal Circumference EPD<sup>5</sup></li> </ol>

<sup>1</sup> Consider selecting bulls based on an index that includes several traits to help meet multiple goals simultaneously

<sup>2</sup> Monitor your market weight trait simultaneously to avoid losses in revenue that exceeds gains in cost savings

<sup>3</sup> Reduction in milking ability of the cow herd can lead to reduced weaning weights

<sup>4</sup> It is important to also assess the temperament of the bull that is being purchased. Even though, with higher Docility EPD, the genetics he is passing to his calves for temperament are good, he may not have been handled correctly and could be a safety concern

<sup>5</sup> Commercial breeders should buy bulls based on their actual/adjusted scrotal circumference measurement, not the bulls SC EPD – increased SC in the bull improves his carrying capacity and his calves will be castrated so the SC EPD is of no value