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Beef Sire Selection Recommendations

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Introduction

The overall goal of a beef operation should be to increase net income. Net income is the difference between how much is spent on the operation and how much income the operation generates. Therefore, beef producers need to focus either on increasing income while minimizing additional cost or on reducing costs while trying to maintain current levels of income. Although the goal of increasing net income applies to the entire beef operation, this article will concentrate on the impact of sire selection decisions. Selecting the right bull for your operation is one of two practices available to improve the genetics of your herd and therefore increase net income. The other practice is crossbreeding, which has a major economic impact, particularly when crossbred cows are utilized, and is recommended for commercial herds. More information on crossbreeding can be found on fact sheet 2014-5.

When considering which bull to purchase, it helps to realize that as you take steps to improve one trait, you often lose ground with another. For example, selecting bulls that will produce heavier offspring, which has a positive impact on income, may inadvertently result in increased mature size and maintenance costs of cows if you are retaining replacements. Finding the right balance between the productivity level of your cows (growth and milk) and the energy required to maintain them is very difficult and, if not done properly, will likely result in decreased reproduction and, consequently, decreased income. Multiple traits selection can be cumbersome, particularly when traits are antagonistically related. Selection indexes can help alleviate the confusion that comes with trying to optimize selection for multiple traits. More information about selection indices can be found on fact sheet 2014-7.

Research has shown that cow efficiency depends on the cow's level of nutrition. Larger, high-producing cows are the most efficient in very lush, high nutritional environments, while smaller, low-producing cows are the most efficient in limited nutritional situations. With optimum nutrition, there are few differences between the breed types in cow efficiency. It is important to consider what resources (primarily nutrition) you have available before you select the breed and specific bull within that breed that best fits the needs of your operation.

It is also helpful to consider, both when setting your budget and selection priorities, the overall impact a bull will have on your herd in the future. If no replacements are kept, the bull's effect is limited to the marketability of your current calf crop. However, if you keep replacement heifers sired by your bull, the bull's genetics will have a long-lasting impact on your herd. Sires used

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Source: NBCEC Beef Sire Selection Manual, 2nd edition

Production Environment		Traits					
Feed Availability	Stress[2]	Milk Production	Mature Size	Ability to Store Energy[3]	Resistance to Stress[4]	Calving Ease	Lean Yield
High	Low	M to H	M to H	L to M	M	M to H	H
	High	M	L to H	L to H	H	H	M to H
Medium	Low	M to H	M	M to H	M	M to H	M to H
	High	L to M	M	M to H	H	H	H
Low	Low	L to M	L to M	H	M	M to H	M
	High	L to M	L to M	H	H	H	L to M
Breed role in terminal crossbreeding systems							
Maternal		M to H	L to H	M to H	M to H	H	L to M
Paternal		L to M	H	L	M to H	M	H

L = Low; M = Medium; H = High.
1 Adapted from Bullock et al., 2002.
2 Heat, cold, parasites, disease, mud, altitude, etc.
3 Ability to store fat and regulate energy requirements with changing (seasonal) availability of feed.
4 Physiological tolerance to heat, cold, internal and external parasites, disease, mud, and other factors.

in the last three generations contribute 87.5% of the genes in a particular calf crop, so it is important to consider all aspects of a sire's influence in your herd when making your decision.

Bull Purchasing Basics

When purchasing a bull, you should assess three primary factors: reproductive soundness, structural soundness, and genetic potential.

Reproductive Soundness—For a bull to have any value to a beef producer, he must be reproductively sound. The best means to determine the reproductive soundness of a bull is through a breeding soundness exam. If a bull passes this exam, he should have the physical capability to breed and settle cows. However, it is important to remember that this test is only valid for the day it was completed, so bulls should be retested each year or before each breeding season to ensure that they are still able to settle cows. This exam does not measure desire to breed (libido), however, so bulls should be observed for their interest in females in heat. Many breeders will guarantee the reproductive soundness of the bull, so it may be helpful to know whether the sellers will provide this service, both in terms of capacity and desire to breed.

Structural Soundness—To be an efficient breeder, a bull must be structurally sound. This means that it should move without pain or discomfort and should have appropriate angles at weight-bearing joints like the shoulder and hock. Ideally these angles would be 45 degrees.

Genetic Merit—The primary reason for purchasing a bull is the expected performance of his calves. If replacement females will be retained, this decision should not be a hasty one because the effects will be long lasting. Breeds differ in their level of productivity; therefore, the first decision should be breed type. Once a breed is determined, selection between bulls for performance should be based on the Expected Progeny Differences (EPDs), whenever possible.

Remember, there is no such thing as the "best" bull - individual beef producers must make that determination based on their individual breeding program goals. There are too many traits to select for all at once, so it is important to choose those traits with the most economic importance for your scenario, and place the most selection emphasis on those metrics. It is also vital to consider the

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USDA NIFA United States Department of Agriculture National Institute of Food and Agriculture

production environment when setting your breeding program goals. Make sure to also place selection emphasis on these traits during selection so that your cattle fit the amount of labor, feed, and environmental resources you have. Common examples of these types of traits are calving ease, milk production, and mature size.

Bull Categories

The following categories are guidelines for finding bulls that meet some of the common needs of beef producers. Depending on your goals and management, you may need to focus on a more unique suite of traits, but this is a good guide for getting started. To find out where a bull ranks in his breed, refer to the EPD Percentile Table from the respective breed association.

• **Heifer Acceptable—**This is a specialty type bull that should be used when a high percentage of first-calf heifers are to be bred. Choose bulls in at least the top 25% of the breed for direct calving ease (usually abbreviated CED) and consider using proven bulls with high accuracy CED EPDs to minimize risk of dystocia. Typically, easy-calving bulls do not express as much growth in their calves as terminal or lower CED sires. To maintain an acceptable level of growth, bulls with extremely low weaning and/or yearling weight EPDs should be avoided.

• **Terminal—**This is a specialty-type bull that should be used when replacement females will not be retained. The purpose of this bull is to produce calves with exceptional feeder calf performance. Therefore, milk can be disregarded, and growth should be emphasized. Upper extremes should be avoided if the cow size is large and there is danger of producing carcasses that are heavier than the accepted standard.

• **Balanced Trait—**Bulls that fit these recommendations should be moderate for calving ease, growth, and milking ability.

• The purpose of this bull would be to produce calves that are acceptable feeder calves while keeping the mature size and milk level of replacement females in moderation. Selecting bulls that rank between the 25 and 75 percent level in their breed for both growth and milking ability should achieve this goal as long as you keep in mind the level of nutritional resources available.

• **Low Maintenance—**This category of bull is for producers who will be retaining and/or selling replacement females that need to have lower maintenance requirements. Unfortunately, cow maintenance EPDs are not currently computed for all beef breeds, but they do exist for some breeds. Typically, cows that have smaller mature size and less milking ability have lower maintenance requirements. Therefore, even if maintenance EPDs are not available, selecting bulls with below-average growth and milk values should produce replacement females that will have lower maintenance requirements. The trade-off is that their siblings, which will be sold as feeder calves, will have less growth as well. It is recommended to avoid the lowest extremes for either growth or milking ability.

• **High Productivity—**Producers with extremely good management practices and abundant feed resources may consider bulls that will greatly increase individual calf productivity. This is easily accomplished by selecting bulls that are in the upper third of their breed for both growth and milk. Feeder calves produced from this mating should exhibit good growth, and replacement females should have exceptional milking ability. The disadvantage is that replacement females produced from these bulls will be larger and have higher maintenance costs. If these cows do not receive adequate nutrition, they will lose body condition, and reduced reproduction rates will be

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observed. This option is not for everyone, and total herd performance should take precedence over individual calf performance.

• **Carcass Merit—**Producers who will be retaining ownership of their calves and who are being paid for carcass merit should place additional emphasis on these traits. A Carcass Merit bull may easily fit one of the above categories but would have the added ability to produce calves with exceptional carcass characteristics. Traits of economic importance would be carcass weight, marbling, and % retail product or yield grade. The pricing scheme that the calves will be sold under will determine the level of emphasis to be placed on each trait. For example, if the calves are to be marketed on a "High Quality Grid," then greater emphasis should be placed on increasing marbling while maintaining acceptable carcass weights. Also, remember that as you increase carcass weight, you also increase mature cow size of replacement females unless using a terminal sire.

Conclusions

Crossbreeding and bull selection have important long-term economic impact on your herd. Selecting the right bull for your operation is a decision that includes setting production goals, analyzing your resources and management, and locating the bull that best fits your situation. If done properly, this process can take considerable time and effort, but the financial and management rewards can be significant.

Beef Sire Selection Decision Flow Chart