



Guide to Commercial Bull Selection

by **Lauren Hyde, Ph.D.**

NALF Director of Performance Programs

and **Kent Andersen, Ph.D.**

Former NALF Executive Vice President

Now that you've decided to breed your cows to a Limousin or Lim-Flex bull, it's time to select one. Selecting a herd sire is one of the most important decisions a cow-calf producer makes. A herd bull contributes half of the genes to the calf crop and plays an essential role in the herd's genetic improvement. While a female usually produces only one calf per year, a herd bull may sire 25 or more—contributing more to the genetic makeup of the herd in one breeding season than a cow contributes during her entire lifetime.

Bull selection starts with choosing a reputable breeder. NALF's online member directory at www.nalf.org is a good place to start. NALF can also provide you with a list of Limousin breeders in your area. Once you contact a breeder, you may want to find out what type of customer service programs he or she offers such as breeding guarantees, calf buy-backs, delivery and advice in selection as well as management and marketing.

Assessing Soundness

After you find a breeder and have some bull prospects in mind, assess whether the bull is reproductively and structurally sound.

The best way to assess reproductive soundness is through a breeding soundness exam (BSE). A BSE is performed by a veterinarian and consists of a physical exam, a scrotal circumference measurement and a semen evaluation. NALF recommends that bulls should have passed a BSE prior to sale or purchase. The seller should make the results of the BSE available as well as specify the guarantee of the bull's reproductive soundness and fertility.

Structural soundness is important in beef sire selection to ensure that a herd sire is capable of effectively breeding females. A breeding bull will need sound feet, legs and eyes in order to seek out females in heat and service them. The bull should have appropriate angles at all weight-bearing joints and move without pain and discomfort.

Other factors to consider in your purchase decision include the bull's conformation, body capacity, frame size, muscling/thickness, libido, disposition, color and presence or absence of horns. You may also want to limit your selection to a virgin bull to reduce the risk of any sexually transmitted diseases from occurring in your herd.

Understanding EPDs and Accuracies

Because a herd bull is responsible for 50 percent of the genes in the resulting calf crop, it is imperative to evaluate the performance characteristics of prospective sires. Selection among bulls for performance should be based on expected progeny differences (EPDs) whenever possible. EPDs provide predictions of the difference in the expected performance of calves sired by one bull compared to calves sired by another bull. EPDs are based on pedigree information and the performance records of animals and their contemporaries, relatives and progeny.

EPDs are much better indicators of a bull's genetic worth than actual and adjusted measurements and ratios. Although adjusted measurements and ratios are helpful when making comparisons between bulls from the same contemporary group, they can be misleading when they are used to compare bulls from different groups or even herds. Environmental factors like feed availability and weather conditions can affect an animal's performance. EPDs take environmental effects like these into account, so they can be used to



©2010 NALF

North American Limousin Foundation

7383 S. Alton Way, Suite 100
Centennial, CO 80112

303/220-1693 • FAX 303/220-1884

Canadian Limousin Association

#13, 4101 - 19th St. NE
Calgary, Alberta, Canada T2E 7C4

403/253-7309 • FAX 403/253-1704

Selecting for Profit the UltraMate Way

Genetic selection targeting specific carcass endpoints doesn't have to be complicated. The UltraMate Crossbreeding System provides a simple three-step plan to efficiently hit end-product and maternal profit targets.

1. Scope out your cows.

Determine the breed composition of your cow herd. How many of your cows are:

- **British and British-cross**
- **British-Continental cross**
- **Continental**
- **Brahman cross**

2. Determine your target market.

- **Mainstream**
Yield grade 1s and 2s
Low choice and select
Zero misfires
- **Muscle**
100% yield grade 1s and 2s
Tender and low fat
Zero misfires
- **Marbling**
Mid-choice and higher
Yield grade 1s, 2s and 3s
Zero misfires

3. Select your genetic solution.

Limousin and the Lim-Flex line of Limousin-Angus hybrids provide you with a full seedstock range to hit your carcass and maternal targets. Depending on your cow herd and your market, choose either Limousin or Lim-Flex bulls to put your next calf crop in the profit zone. The table below can help with your decision.

Breed Composition of Cows	Target Market	Limousin or Lim-Flex Bulls?
British and British cross	Mainstream	Limousin
	Marbling	Lim-Flex
British-Continental cross	Muscle	Limousin
	Mainstream	Lim-Flex
	Marbling	Lim-Flex
Continental	Muscle	Limousin
	Mainstream	Lim-Flex
Brahman cross	Muscle	Limousin
	Mainstream	Lim-Flex

Once you've decided on Limousin or Lim-Flex, select sires with the best combination of EPDs and ultrasound scans for your market.

Trait	Mainstream	Muscle	Marbling
EPDs			
Growth	X	X	X
Ribeye Area	X	X	
Yield Grade	X	X	
Marbling	X		X
Ultrasound Scans			
Ribeye Area	X	X	
IMF (Marbling)	X		X

fairly compare the genetic merit of animals not only across contemporary groups and herds but also across an entire breed.

EPDs are used to make genetic improvement in both seedstock and commercial herds. Genetic improvement can mean higher calf sale weights, enhanced female reproductive function and better performance on the rail—all of which can enhance the profitability and viability of the operation.

NALF publishes EPDs for 14 economically important traits in its summer and fall sire summaries, along with tables of EPD breed averages and percentile rankings. NALF's web site also has tools that allow producers to look up EPDs for individual animals and to search for sire prospects based on the producer's own EPD selection criteria.

EPDs can change over time as additional performance information is collected. Accuracy values are published with EPDs to give an indication of the reliability of the EPDs. Accuracies range from 0 to 1 with values closer to 1 meaning greater reliability. As more performance information becomes available on an animal, the more accurate its EPDs become.

Because most bulls purchased by commercial producers are young with few progeny, if any, their EPDs are usually associated with low accuracy values. However, EPDs with low accuracy are still better predictors of genetic potential than either adjusted measurements or ratios. What's more, the accuracies associated with the average EPDs of the sires in the entire bull battery can be quite high.

Suppose you are using three bulls with the following yearling weight EPDs and accuracies:

	Yearling Weight EPD	Yearling Weight Accuracy
Bull 1	75	.30
Bull 2	85	.30
Bull 3	95	.30
Average	85	.60

Although the accuracy of each bull's yearling weight EPD is only .30, it can be shown mathematically that the accuracy of their average EPD (+85 pounds) is approximately .60. As the number of bulls increases, the accuracy associated with their average EPD for any given trait also increases.

Before you can put EPDs to work for you, realize that as you make progress in one trait, you can lose ground in another. This is because of a phenomenon

EPD Target Profiles for Bulls in Different Production Scenarios

(based on the Spring 2010 International Limousin Sire Summary percentile rankings for 2008-2010 born calves)

EPD	Heifer Bull		All-purpose Maternal Bull		Carcass/Terminal Bull	
	Percentile	EPD	Percentile	EPD	Percentile	EPD
Calving Ease Direct	≥10%	≥13	≥60%	≥6	≥80%	≥5
Birth Weight	≥20%	≤-0.1	≥70%	≤2.5	≥80%	≤3.0
Weaning Weight	≥60%	≥41	≥50%	≥42	≥30%	≥47
Yearling Weight	≥60%	≥76	≥50%	≥80	≥30%	≥87
Milking Ability	*	*	≥30%	≥24	**	**
Calving Ease Maternal	≥50%	≥3	≥40%	≥4	**	**
Scrotal Circumference	≥50%	≥0.4	≥20%	≥0.6	≥70%	≥0.2
Stayability	≥60%	≥16	≥40%	≥18	**	**
Docility	≥40%	≥17	≥30%	≥19	≥60%	≥13
Carcass Weight	≥80%	≥9	≥60%	≥16	≥30%	≥27
Ribeye Area	≥70%	≥ 0.27	≥60%	≥0.36	≥30%	≥0.55
Yield Grade	≥70%	≤ 0.02	≥60%	≤ -0.02	≥30%	≤ -0.11
Marbling Score	≥60%	≥ -0.05	≥40%	≥ 0.00	≥20% ***	≥0.09
Mainstream Terminal Index	≥60%	≥43	≥50%	≥44	≥30% ***	≥46

* Match milk to available resources. ** Not applicable if daughters are not retained.

*** For mainstream and marbling markets. Not applicable to muscle markets.

called pleiotropy, where one or more genes affect either negatively or positively more than one trait. A classic example of pleiotropy occurs with growth traits. As producers select for increased weaning and yearling weights, birth weights also increase, leading to more dystocia. As well, the mature size of retained replacements can increase causing higher maintenance costs and decreased reproductive function. Using tools like NALF’s online sire selector, you can identify animals with favorable EPDs across all antagonistically-related traits.

Matching the Bull to the Production Environment

Bull selection for any cow herd should target an acceptable combination of traits that complements the strengths and weaknesses of the cow herd. You should try to strike a balance among the various traits and avoid extremes. Bulls should match the cows, markets, management and environment of the operation.

To get a clearer picture of the type of bull that’s appropriate for your needs, develop goals for your operation and evaluate your herd critically to determine if it will help you meet them. Be prepared to ask yourself some questions: Have you been having problems during calving season? Limit your search to calving ease bulls. Are calf weaning weights lower than you’d like? Then choose a bull superior in growth traits.

Ultimately, based on the strengths and weaknesses of

your cows and the goals for your next calf crop, you’ll want to determine a target EPD profile for prospective purchases. NALF’s table of EPD percentile breakdowns, published with every sire summary, shows you how animals rank within the breed. The table of percentile rankings can be very helpful in setting minimum or maximum standards for each trait of interest.

The following provides EPD selection guidelines for different types of bulls needed for some of the more common production scenarios. Target EPD profiles are given in the accompanying table.

• The Heifer Bull

Use when breeding first-calf heifers. Select a bull with high EPDs for calving ease direct. Because birth weight is a component of calving ease, there is little reason to also select for low birth weight. Extreme selection on both calving ease and birth weight EPDs may result in too much selection emphasis on birth weight and in turn sacrifice growth.

• The All-purpose Maternal Bull

Use when retaining females as replacements and marketing feeder calves. Not only should this bull enhance early puberty and longevity in replacements and keep the mature size and milking ability of the cow herd at moderate levels, but also he should produce superior feeder calves. Select bulls with moderate EPDs for growth and milk. Avoid extremes for these traits. Milk EPDs should be matched to the available forage and feed resources. Consider high scrotal

circumference and calving ease maternal EPDs to reduce age at puberty and the incidence of dystocia among daughters. Above average stayability EPDs can enhance longevity and sustained reproductive function among the cows. If temperament is a problem within the herd, look for bulls with high docility EPDs.

• **The Carcass Bull**

Use when retaining ownership of calves through the feedlot. The purpose of this bull is to produce calves with superior carcass characteristics for the targeted grid. For lean carcass yield grids, emphasize bulls with high ribeye area and low yield grade EPDs. For carcass quality, choose bulls with superior marbling score EPDs. In both cases, target superior EPDs for growth and carcass weight, but avoid upper extremes if cow size is large to prevent heavy carcasses. If you do not intend to retain any heifers for breeding, there's no need to select for traits like milk and calving ease maternal.

Putting It All Together

Selecting the right bull depends on your breeding objectives, determined by understanding the strengths and weaknesses of your cow herd and the goals for your next calf crop. The best bull for one producer may not be the best for another.

The more information you use in bull selection, the fewer surprises. It is important to use both performance information and visual appraisal in choosing a breeding bull. If you select solely on performance numbers, you may inadvertently choose structurally unsound or infertile bulls that will do little for calf crop percentage and herd improvement. On the other hand, if you select bulls based only on visual appraisal, you will almost certainly overlook bulls with genetics more appropriate to your situation.