



# Selecting for Profit

*Potential profit is the primary goal when selecting and buying bulls.*

by Heather Smith Thomas

## Bull Management



Seedstock producers select and purchase bulls to add a new bloodline or to increase the impact of a desired bloodline in their herd — seeking to continually improve their cow herd “factory” for producing superior genetics. The goal is generally to increase their ability to raise better seedstock that will fit their commercial customers’ needs. Commercial producers select and purchase bulls for several purposes — to find maternal sires whose daughters will improve their cow herds or bulls that will sire good calves but be appropriate to use on heifers, eliminating calving problems and sometimes to select terminal sires whose progeny will all do exceptionally well in the feedlot.

Cattlemen utilize several methods and tools to aid the selection process and to help in their buying decisions. Traditionally a critical evaluation of phenotype and physical characteristics has been the tried and true way to select cattle. Visual appraisal is still important today, especially when looking at features difficult to measure

with mathematical and computer calculations — such as feet and leg conformation/soundness, athletic ability, udder structure or disposition.

Expected progeny differences (EPDs) have been a great selection tool for bull buyers over the past several decades, but now cattlemen have another tool, profit (\$) indexes, that can

be even more beneficial. Indexes are composites of some of the EPDs that breed associations calculate. Economic weightings are placed on the various EPDs to create the indexes.

### Using indexes to aid selection

Indexes have been in use for a long time in other livestock species like swine, poultry,

and dairy; the original research paper describing this methodology was published in 1943. Swine, poultry and dairy breeders have been using indexes, such as sow productivity, for multi-trait selection, but in the beef industry, this tool is relatively new. Yet, it is probably the most powerful tool for making genetic selections for progress in a herd or when selecting a bull whose calves will be most profitable in the feedlot. EPDs are helpful if producers want to predict an animal’s genetic level for a certain trait, but they don’t really answer the question producers usually want to know: how much more money will this bull make me than this other bull will?

Potential profit is the primary goal when selecting bulls. Having a dozen EPDs to compare poses a challenge, especially when sitting at a bull sale trying to make a decision. Indexes, by contrast,

answer the question of how much profit a certain bull might make, compared to another.

Indexes use multiple EPDs with input costs factored in. Everything from the cost of hay and corn to price grids on quality grade, yield grade and carcass weight is taken into consideration. Beef producers have had the benefit of EPDs for more than 25 years, but as one stockman commented, EPDs without economic selection indexes is like having highways without maps — you can drive fast but can't be sure you are traveling in the right direction. Indexes provide the maps.

The American Hereford Association (AHA) developed four profit indexes introduced in 2005 to enable breeders and their commercial customers to select bulls to maximize profits in different production settings looking at the relevant traits in these various situations. The relative economic values for each group of traits are paired with EPDs to produce the index dollar value. Comparing the index of various bulls can provide the difference in dollar value prediction for profit potential.

Many beef breeds have developed terminal sire indexes to predict profit potential of the offspring in terms of feedlot performance and carcass qualities. AHA has developed several maternal indexes as well as a terminal sire index. The maternally oriented indexes are designed to combine genetic factors that impact productivity and profitability of cows in a herd retaining its own replacements and markets calves at weaning.

The three maternal indexes in the Hereford breed include the Baldy Maternal Index (BMI\$), which can aid commercial producers maximize profits when they use Hereford bulls in rotational crossbreeding programs with Angus-based cows. This index helps the producer select bulls that will sire good females to retain in the herd, as well as produce calves that can be marketed profitably on a Certified Hereford Beef (CHB®) pricing grid.

The Brahman Influence Index (BII\$) helps producers select Hereford bulls that will create the most profit in a rotational crossbreeding system using Brahman-influenced cows. This index emphasizes age at puberty, fertility and maternal traits with less emphasis on growth. Offspring marketed is aimed toward a commodity pricing grid since Brahman cattle are not utilized in a CHB program.

The other maternally-oriented index is the Calving Ease Index (CEZ\$), which is used for selecting bulls to breed heifers. This index has the most emphasis on direct and maternal calving ease.

The Certified Hereford Beef Index (CHB\$) helps producers select terminal sires for British-cross cows, where all offspring are sold as fed cattle on a CHB pricing grid. This index evaluates growth and carcass traits, with no emphasis on milk or fertility.

### Simplified selection

Sean McGrath, a rancher and cattle management consultant, says indexes simplify a lot of things into one number.

“Part of the challenge with EPDs is that there has been so much work in developing them that there are a lot of numbers,” he says.

There are many EPDs to consider when selecting a bull, as a result, it can become overwhelming when deciding which bull to buy.

“If you are using bulls to create replacement

females, some of the maternal indexes will simplify the selection of those bulls,” he says.

“Those indexes take into consideration things like calving ease, longevity, growth performance,

how much calf you'll have at weaning to sell — all the things that go into low-cost, long-lived, productive females in the herd. It simplifies putting together all the information you'd need in order to figure out which cows will be good ones.”

Using indexes takes away a lot of the guesswork and mathematic calculations, especially when trying to balance the traits that can negatively impact one another such as milk (bigger calves) and longevity (the high-producing cows often wash out quicker) or going too far on calving ease and reducing performance or having more feed-efficient cattle that don't grow enough. Putting too much emphasis on any one trait or facet of production will affect other parts of the profit equation. The index puts all of these important factors into a good balance.

The CHB\$ does the same thing as the maternal indexes, but it's simpler because it's a terminal type index — all offspring are going to the feedlot so the emphasis is on carcass and feed efficiency.

“Indexes are probably not the ‘be all, end all’ solution in selection, but if you know what you are buying the bull for, these indexes certainly help you in that direction,” McGrath says. “The way they are created and

designed, the market can change a lot, the price of beef can change, and the price of hay or corn can fluctuate, but the relative importance of those things doesn't change much. If you are selecting a bull to produce replacement heifers, we know that over the next 10 years the markets will probably keep changing, but an index still puts the right amount of emphasis on the right traits.”

McGrath says the price of calves can change 50% one way or another and it won't affect

how those animals should rank in terms of being profitable.

“It may change the total profit at the end of the day, but it won't change the ranking of the more profitable animals versus the less profitable ones. So you will always be making progress in the direction you want to go.”

Indexes help narrow the list, he says, as long as cattlemen are looking at the right index for their production goals.

*continued on page 46...*



## Real-world scenario

Economic selection indexes allow cattle producers to select animals with the most favorable combination of EPDs to maximize profit in a given situation. As an example, EPDs for four fictitious Hereford bulls are listed in Table 1.

Of these four sires, which would be expected to generate the most profit in a rotational crossbreeding program, when mated to Angus-cross cows and heifers?

Each of the four bulls excels in at least one economically important trait. Bull A is the most favorable for scrotal circumference, an indicator of early puberty and increased lifetime female fertility. Bull B has the most favorable combination of calving ease and growth, but is less desirable than breed average for both fat and ribeye area. The bull with the highest milk and marbling (MARB) EPDs is C, but he is the least desirable for calving ease. In contrast, Bull D is the calving-ease sire of the group, but is only average for growth, and in the bottom 5% of active sires for MARB.

The answer to this question is found by comparing the index values in Table 2. Bull B would be expected to sire the most profitable calves for this scenario, slightly better than A, and significantly better than D or C. His BMI\$ value is the highest of the four bulls. His calves should generate \$2.14 more profit per head, compared with A (\$25.35 – 23.12 = \$2.23), and \$19.86 more profit per head than C. If B and C each produce 25 calves per year for four years, a producer should realize \$1,986 more profit using B compared to C, including the cow herd contributions of daughters of B compared with daughters of C (25 calves x 4 years x \$19.86 per head = \$1,986).

Note that each of the four bulls is best for one of the indexes. While B is an excellent choice for the scenario just discussed, he would be only second best as a terminal sire (CHB\$) or a sire of heifer bulls (CEZ\$). When crossed with Brahman-influenced females, A would be a somewhat better choice (BII\$), largely the result of his high scrotal circumference EPD. Bull C's favorable carcass genetics make him the most profitable terminal sire, while D is the best choice as a sire of heifer bulls, given his genetic values for calving ease. **HW**

**Table 1. EPDs for four Hereford bulls.**

Bull	CE	BW	WW	YW	MM	M&G	MCE	SC	FAT	REA	MARB
A	-3.0	5.0	35	65	25	40	-3.0	2.0	-0.01	0.30	-0.05
B	4.0	1.0	55	70	10	35	2.0	1.5	0.02	-0.20	-0.10
C	-4.0	4.5	45	75	30	50	-3.0	0.0	-0.03	-0.30	0.10
D	10.0	1.5	30	60	20	35	7.0	0.8	-0.02	-0.20	-0.25

**Table 2. Index values for the four Hereford bulls in Table 1.**

Bull	BMI\$	BII\$	CEZ\$	CHB\$
A	23.12	26.76	14.06	14.25
B	25.35	23.86	20.77	18.49
C	5.49	4.45	7.67	22.50
D	17.16	13.54	25.86	10.37

**“If you are selecting a bull to produce replacement heifers, we know that over the next 10 years the markets will probably keep changing, but an index still puts the right amount of emphasis on the right traits.”**

**— Sean McGrath**



Economic selection indexes enable cattlemen to select bulls with the most favorable combination of EPDs to maximize profits.

“Some ranchers feel that a bigger number is always better, no matter what the trait, so the indexes are nice because a bigger number moves you toward the goal of the index,” McGrath explains. “Sometimes a bigger number is created by having smaller numbers in certain areas like milk. A higher maternal index bull might have a lower milk EPD and a higher stayability/longevity number, and at the end of the day, those daughters may be more profitable. Lower milk might be what many ranchers need, for their cows to stay in the herd a long time. The index blends everything together.”

Indexes do a great job in balancing various traits to meet production goals. “This means that even with large swings in the market or inputs — or significant differences in management — these cattle consistently maintain their relative rankings in the index,” McGrath says.

Economic selection indexes enable you to select bulls with the

most favorable combination of EPDs to maximize profits whether in a rotational crossbreeding program, breeding heifers or for a terminal sire program, where all calves go to the feedlot under retained ownership. When you are simply looking at EPDs, it can be difficult to select between several bulls, whereas an index can allow favorable EPDs for one trait to compensate for less favorable EPDs in another trait. The index does the math for you and can identify the bulls with the overall most profitable genetics.

When you study index values you may discover milk EPD has very little effect. The economic value of milk is nonexistent in the terminal index and plays only a very small role in the maternal indexes. In fact, increased milk has a negative value. This is partly because most breeds, including Hereford, have selected for higher milk EPDs over the past two decades, and many cows now produce too much milk to be profitable. They require higher feed inputs and also may not have the longevity desired to stay in the herd a long time. Using an index to help you make genetic selection can put these things into their proper perspective. **HW**