YOUR LINK TO

by **RON BOLZE,** *director of genetic programs, Certified Angus Beef LLC*

Putting expected progeny differences in perspective

Due to progressive, forward-thinking Angus seedstock producers' data contributions to the Angus Herd Improvement Records (AHIR) program, the American Angus Association database remains the elite source of genetic information for any breed association worldwide. It's perhaps the singular most significant accomplishment of the Association in recent years.

Expected progeny differences (EPDs) on performance and carcass traits enable Angus seedstock and commercial producers to make directional genetic change in economically important traits at a rate that was beyond imagination just a few short years ago. This has been accomplished largely through extensive use of artificial-insemination (AI) sires in the seedstock sector and through their sons used for natural service in commercial herds.

As the words would imply, EPDs indicate how we would **expect progeny** *from a given sire to* **differ** *from progeny of a breed-average sire.*

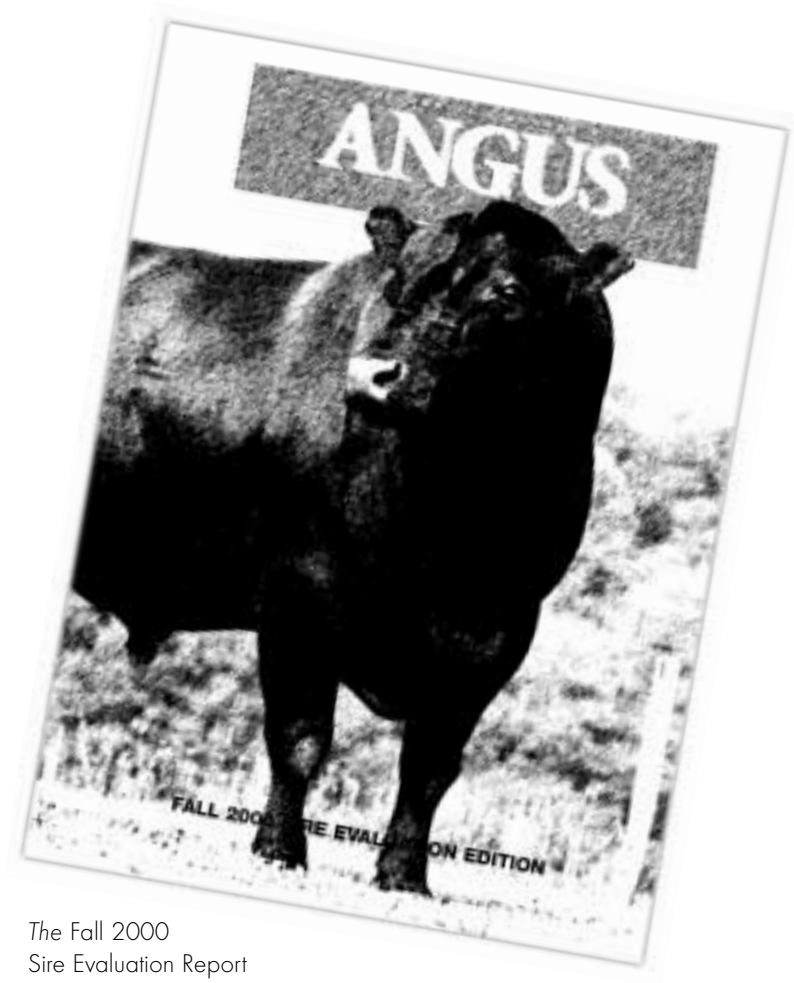
One of the most common misconceptions about EPDs may be the belief that breed-average EPDs are zero. Although near zero for a few traits, most Angus EPDs are above zero due to seedstock selection and the resulting genetic trend over time.

Angus seedstock and commercial producers alike need to have a working knowledge of the most current EPDs. Breed-average EPDs for the 19,220 sires in the Fall 2000 Sire Evaluation Report *are listed in Table 1.*

The current sires are those that have had at least one calf recorded in the herd book within the past two years. Note that these current sires represent a subset of 149,779 total sires with progeny records in the Association database. An Angus bull with a yearling weight (YW) EPD of 50 pounds (lb.), for example, would be below the current Angus breed average for yearling growth.

Another misconception about EPDs is that producers often use them to predict future progeny performance. This is not possible due to variations in factors beyond genetic control that affect progeny performance – variations in environment from year to year, for example.

Instead, EPDs do a masterful job of ranking individual sires for economically important traits. Understanding the concept of percentile rankings makes sire selection with EPDs easier. The Fall 2000 Sire Evaluation Report *percentile breakdown for the 19,220 current sires is presented in Table 2 (top 1%, 10%, 50% and 100% of sires).*



The Fall 2000
Sire Evaluation Report

These percentile rankings assume that minimum birth weight and fat thickness are desirable, as well as maximum weaning weight, yearling weight, milk, carcass weight, marbling, ribeye area (REA), percent retail product and scrotal circumference. Maximum or minimum EPDs may not fit the objectives of individual seedstock or commercial genetic selection programs, especially since no individual sire is the "best" in all traits.

As expected, to be in the top 50% of current sires, EPDs are breed average or higher. The top 1% merely displays the extremes for light birth weight, high growth, large scrotal size, and carcasses characterized by heavy carcass weights, high marbling scores, large REAs, minimal external fat and high percent retail product (obviously not all found in the same sire). The top 100% for individual traits merely presents the opposite extreme. Again, no single sire is at the bottom for all traits.

One might assume that rapid genetic change could be made if only sires with EPDs in the top 10% for all traits were used. However, a sort of current sires with EPDs in the top 10% for all traits (no accuracy designation, including sires in the main sire evaluation and supplemental, or "young," sires) reveals that no sires are in the top 10% for all traits.

Numerous attempts have been made to determine objectively the economic value of using Angus sires with superior EPDs. Although no attempt to quantify the economic value of superior EPDs will be made at this time, the following selection criteria can result in the

corresponding potential change in progeny performance and enhanced income potential.

- **Lighter birth weight (BW) EPD.** Less calving difficulty, increased calf crop weaned, enhanced rebreeding date and rate.
- **Heavier weaning weight (WW) EPD.** Heavier weaning or sale weight.
- **Heavier yearling weight (YW) EPD.** Faster feedlot gain, improved feed efficiency.
- **Higher milk EPD.** Heavier calf weaning weight from a bull's daughters.
- **Heavier carcass weight (CW) EPD.** Heavier carcass weights.
- **Higher marbling EPD.** Increased Certified Angus Beef ™ (CAB®) acceptance rates, more favorable quality grade distribution.
- **EPDs for higher ribeye area (REA), lower fat thickness (FT) and higher percent retail product.** More favorable yield grade distribution.
- **Higher scrotal circumference (SC) EPD.** Earlier daughter age to puberty (however, unrelated to daughter pregnancy rate), shorter daughter postpartum interval.

Selection for EPDs in the indicated direction can result in favorable changes in many economically important traits. In this example, genetic selection resulting in less calving difficulty, faster rebreeding, increased calf-crop percentage, heavier sale weights, faster, more efficient feedlot gains, heavier carcasses with greater CAB acceptance rates and more Yield Grade (YG) 1s and 2s, and more reproductively efficient daughters appears to be a "no brainer." EPDs are the singular best genetic selection tool to make directional change in measures of output, resulting in greater income for commercial production.

Table 1. Angus EPD averages of current sires*

Birth weight (BW)	2.8
Weaning weight (WW)	31
Milk	15
Yearling weight (YW)	57
Carcass weight (CW)	7
Marbling score (MB)	0.07
Ribeye area (REA)	0.14
Fat thickness (FT)	0.00
Percent retail product (PRP)	0.10
Scrotal circumference (SC)	0.10

Source: Fall 2000 Sire Evaluation Report.

*Current sires are those that have had at least one calf recorded in the herd book within the past two years.

The rest of the story

Any business, including commercial cow-calf production, that is driven by profitability is constrained by the following formula.

Profitability = value of output (income) - cost of inputs (expenses)

Yes, selection for more extreme EPDs can be used to increase income, but what effect does this have on cost of inputs and profitability? Let's use some of the same selection criteria from the previous example.

- **Heavier WW EPD.** Larger mature cow size, increased cow maintenance requirements and cow costs, reduced carrying capacity, reduced cow longevity, increased replacement rates.
- **Heavier YW EPD.** Larger mature cow size, increased cow maintenance requirements and cow costs, reduced carrying capacity, reduced cow longevity, increased replacement rates.
- **Higher milk EPD.** Increased cow maintenance requirements and cow costs, reduced rebreeding dates and rates, increased replacement rates, reduced cow longevity.

Take-home message

Note that not all Angus sires that excel in growth produce daughters that are too large to be productive for their environment. Individual Angus sires do exist that excel in rapid, early growth (weaning and yearling EPDs), moderate mature daughter weight and height EPDs, and functional characteristics – simultaneously. Time and effort are required to find them, especially when a sire is a minimum of 5 years old before his daughters are in production.

Commercial use of EPDs requires a balancing act wherein some individual sires with extreme EPDs that contribute greatly to the enhanced-income side of the equation (value of output) fail miserably on the cost-of-inputs side (expenses) due to excessive mature cow size, excessive milk production and negative functional characteristics under practical commercial environments.

Unfortunately, objective measures for most functional traits do not exist at this time and only can be assessed through direct experience or through the opportunity to see a sire's daughters in production in numerous herds over time.

From a commercial perspective, EPDs are a selection tool – not a merchandising tool. Commercial producers need access to Angus genetics that have been sorted by the environment over time wherein functional traits (such as fleshing ability, udder quality, maternal instinct, feet and legs, and disease resistance) that determine longevity have been allowed to express themselves, not having been masked by oversupplementation.

Summary

As stated previously, EPDs are the best genetic selection tool to make directional change in measures of output and income and can contribute greatly to profitability. However, selection for traits that influence maternal function under practical commercial conditions will help balance the profitability equation.

The Angus mother cow has been the foundation for practical commercial production for years. A commonsense, judicious approach to the use of EPDs, coupled with intense selection for maternal function, will help ensure her continued role in the production of the highest-quality product at the least cost.

Table 2. Fall 2000 EPD percentile breakdown

Top	BW	WW	MK	YW	CW	MB	REA	FT	PRP	SC
1%	-2.2	54	29	96	35	0.59	0.61	-0.06	1.0	1.21
10%	0.3	43	23	78	21	0.31	0.36	-0.03	0.6	0.63
50%	2.8	31	15	58	7	0.07	0.14	-0.01	0.1	0.07
100%	11.8	-38	-19	-77	-40	-0.65	-0.59	0.09	-1.2	-1.67