

EPDs and the Purebred Breeder

It is difficult to understand why cattlemen are slow to accept management tools and adopt practices that would benefit them. Most people pass off this concern because beef cattle are of low priority on most farms. Expected Progeny Differences (EPDs) should be of primary importance to the seedstock producer, regardless of herd size, breed, and program direction. Today, breed sire summaries and the EPD values for bulls save money for cattlemen because their use can manage genetic risk. These tools (sire summaries and EPDs) take much of the guesswork out of breeding programs. Sire summaries and EPDs not only reduce risk, they serve as a tremendous marketing tool for the seedstock producer.

Expected Progeny Difference is an estimate of how progeny of an animal are expected to perform as compared to the breed average or progeny of other animals within the breed. Our discussion will center on bulls and how to use EPDs to improve productivity through selection and to make certain the product produced is highly merchandisable. In past years, a bull's individual performance was used when making selections. Today, however, we know that EPDs are several times more reliable than individual performance when predicting progeny performance.

What makes EPDs more accurate than anything previously available? A sire's EPD accounts for the following factors:

- Genetic value of cows to which a bull is bred
- Environmental differences affecting contemporary groups
- Quality of other sires in the contemporary group
- Genetic trend

Upon reviewing these four factors, we find that genetic values (EPD) are available on both bulls and cows. Within each breed, there are reference sires

and, because of artificial insemination (AI), these sires are used under all environments. Genetic trend simply means that breeds upgrade their base for comparison from time to time. For reasons described, EPD values provide a tremendously accurate tool to evaluate genetics within beef breeds.

EPDs used in a breeding program will help:

- Improve Efficiency
- Increase Productivity
- Produce A Specific Product
- As a Breeding Tool
- Merchandise

EPDs describe the genetic value of an animal much like a feed tag describes the contents in a feed sack (Table 1).

Table 1. Read The Label

Feed Tag	Content	EPD
TDN		BW
Protein		WW
Salt, etc.		YW
		Milk, etc.

Every seedstock producer takes a different approach to the coming breeding season. What follows is a suggestion that might help when planning what bulls one might use. See Table 2.

A listing of all cows in the herd for column one is the starting point. Next, take one-half the EPD values and list beside each cow's number (name). This same procedure will be followed for each bull being considered. Only one-half the genetic material (EPD values in our case) is found in the egg pro-

Table 2. Calculating Progeny EPDs

Cow					Bulls																
					Trustmark					Skywalker											
1/2 EPD Values					1/2 of EPD Values																
					6.4	26.5	39.8	-9.4							.8	13.4	20.4	7.5			
Bess	0.0	2.0	4.0	1.0	6.4	28.5	43.8	-8.4													
Olive	.6	4.7	8.2	9.2	7.0	31.2	48.0	-0.2													
Donna	.3	2.6	5.3	12.9	6.7	29.1	45.1	3.5													

Table 3. Possible Change for Various ACC Values

(Plus or Minus)						
ACC	Birth Weight	Weaning Weight	Yearling Weight	Scrotal Circumference	Maternal Milk	
0.0	3.9	17.2	25.4	0.68	19.9	
0.1	3.5	15.5	22.9	0.61	17.9	
0.2	3.1	13.8	20.3	0.55	15.9	
0.3	2.7	12.1	17.8	0.48	13.9	
0.4	2.4	10.3	15.3	0.41	11.9	
0.5	2.0	8.6	12.7	0.34	10.0	
0.6	1.6	6.9	10.2	0.27	8.0	
0.7	1.2	5.2	7.6	0.20	6.0	
0.8	0.8	3.4	5.1	0.14	4.0	
0.9	0.4	1.7	2.5	0.07	2.0	

duced by the female, and in the sperm produced by the male. By listing one-half the EPD values, one simply adds the EPD values for each proposed mating to get a predicted EPD of the progeny. In columns two and three are the two bulls considered for use through an AI program. Simply add the half values shown to get the progeny EPDs.

At this time, the appropriate question would be, what progeny will market best based upon EPD values? In this example, the Skywalker calves have EPDs that are balanced over the EPD traits listed. They are low for birth weight, highly positive for milk, and have strong plus values for both weaning and yearling. These EPD values for progeny produced by Skywalker and the three cows listed are very acceptable within the industry and should demand attention in the market place. Many would say, they have balanced EPDs.

The Trustmark calves do not have balance for EPD traits. Birth weights are heavy and two of the milk values are negative. There are some that might get excited over the highly positive weaning and yearling values and they should. However, both birth weight and milk EPD values must be considered. The Trustmark bull has tremendous genetics for growth and, if he is used, he should be bred to the Donna cow. The progeny EPD values from this mating are certainly eye catching. Even the milk EPD value is a positive 3.5. The biggest concern remains the high birth weight EPD of 6.7.

When planning your breeding program, calculate the EPD values for each proposed mating and ask yourself if the resulting EPD values are acceptable to you, your customers, and potential customers? For whatever the reason, if the calculated progeny values are not acceptable, then the mating should not take

place. However, there are exceptions; we may want to make use of certain genetics and be willing to sacrifice in another area(s).

Accuracy values, EPDs, and the risk involved should be discussed in some detail. How reliable are EPD values? Accuracy (ACC) values are an expression of reliability. The accuracy range is from 0.0 to 1.0. The EPD is more reliable as accuracy approaches 1.0 and changes less as more progeny data are accumulated. EPDs should be used to determine which bulls to use while accuracy values suggest how extensively to use them.

Accuracy is an abbreviated way of expressing the reliability of an EPD. In some sire summaries, there is a possible change chart or the standard error of prediction. Changes in EPD are expected to fall within the possible change range 67 percent of the time. Table 3 shows the possible change at different levels of accuracy for various traits. (This table is for Polled Hereford.)

For any one trait, as accuracy increases, the possible change decreases. For example, if the accuracy of a bull's milk EPD is .20, the expected possible change in EPD is ± 15.9 . If the milk EPD is +10, then the potential range in EPD = -5.9 to +25.9. There are a couple of ways to view the potential range figure. Sixty-seven percent of the time, progeny produced will fall within this range for milk. When final results are in, the worse scenario for this bull's milk EPD might be -5.9 and the best scenario might be a milk value of +25.9. Look how the possible change decreases when the accuracy of this same bull's milk EPD reaches .8 and his EPD milk value is +10. The possible change in EPDs decreases ± 4 , EPD = +6 to +14. Now, the worse scenario for this bull's milk EPD is +6 and at best it could be +14. As accuracy value moves upward, the possible change value decreases and one's confidence in outcome grows.

Table 4. Example of EPD Possible Change

Bulls	Maternal Milk	ACC	Possible Change (+)	High & Low
Trustmark	-18.8	.20	± 15.9	-2.9/-34.7
Skywalker	15.0	.81	± 4.0	19.0/11.0
38 Special	-10.0	.20	± 15.9	5.9/-25.9
Hotline 135	- 2.1	.55	± 9.0	6.9/-11.1
HHH Muchmore	19.4	.29	± 13.9	33.3/5.5

Table 5. Minimize Your Risk

Bulls	BW	EPD, ACC, Possible Change		
		WW	YW	Milk
Tomahawk	6.7	24.9	37.0	2.3
	.8	.76	.57	.51
	$\pm .8$	± 5.2	± 10.2	± 10.0
Butlers Image	2.6	17.6	26.8	22.9
	.56	.47	.16	.16
	± 1.8	± 9.4	± 21.6	± 16.9

Look at Table 4 or several examples of EPD possible change figures. Note that one's confidence can build even when accuracy values are low if the EPD value is larger than the change value.

The HHH Muchmore bull has an EPD of 19.4 and an accuracy value of .29. Many seedstock producers might see the low accuracy value (.29) and eliminate this bull. Look again at the possible change chart and you find the change value to be +13.9. When applied to EPD of 19.4 the range is +5.5 to +33.3 for milk. The very worse scenario for this bull's milk EPD might be +5.5 and at best +33.3. The possible change chart can be very revealing! This bull, even with the low ACC value appears to be a safe bet to always have a plus EPD for milk.

In the description about possible change, only one trait has been used as an example and that was milk. In Table 5, let's look at four EPD values and discuss how one might quickly look at the EPD, the accuracy value and the possible change to determine the risk of any one trait. Note how the values are listed, one under the other. If the EPD value is greater than (larger) the possible change value, then the EPD should always be plus, even in the worse scenario.

All EPD values for the bull Tomahawk are greater than the possible change values and should always be plus values, except for milk. For milk, the possible change (± 10.0) is greater than the EPD milk value and could easily change to a negative figure over time, -7.7 to +12.3 range.

All EPD figures for the Butlers Image bull are positive and larger than the positive change value for each trait. Therefore, even the worse scenario should leave plus values for each trait, including the milk value. The possible change for milk EPD (22.9) is ± 16.9 . The worse scenario is a +6.0 EPD for milk and could range to 39.8.

Much explanation has focused on the possible change figures with good reason. Even with low accuracy values, if the EPD value is greater than the possible change figure, one can use the bull with a degree of confidence. Therefore, while we often use bulls with high accuracy values that accompany the EPDs that best suit the needs of the herd, do not overlook those young sires with desirable EPD values. Simply use the possible change chart so you can find a degree of confidence, even when the accuracy value is low.

As we close discussion on EPDs and the seedstock producer, let us take a final look at your breed. Look at each trait and ask yourself what EPD values (what range) will allow you to sell your breed for the top dollar at your farm and in the market place (see

Table 6 for suggestions). Remember, these are only suggested ranges. Many believe the negative (-) values on milk are acceptable. I would only state that cattle with negative milk values will be discounted in most markets.

In the market place, regardless of one's belief, it is not impossible to be competitive when one chooses to use natural mating. However, the use of artificial insemination allows one to use the outstanding bulls of the breed without owning them. Certainly, the sire summary is the place to evaluate the bulls of the breed. Once you find the bulls that best meet your needs, their semen can generally be secured. Do not overlook the tremendous tool of AI. It can keep even the smallest producer competitive.

There are those who believe that certain breeds should be selected for growth and fit best in the commercial industry as a terminal cross. I believe that those breeds with good maternal qualities are the most acceptable. Therefore, emphasis on maternal values, regardless of the breed, is important. Use moderation in birth weight, push hard on the milk trait, and let weaning and yearling fall where they will, as long as they are positive. If your breed is to be considered a maternal breed, then make certain the breed has milk, can calve with ease, are easy keepers, and excel in disposition.

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Table 6. Suggested EPD Range for Various Breeds

	Polled Hereford Limousin Charolais Santa Gertrudis Beefmaster Salers	Anus Shorthorn Brangus	Simmental Gelbvieh
Birth Weight	-3/+5	-3/+5	-3/+5
Weaning Weight	+	+	+
Yearling Weight	+	+	+
Milk	+5/+25	-2/+20	-5/+15