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## Using Expected Progeny Difference (EPD) and Scenarios in Livestock Judging Contests

by

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### INTRODUCTION

Using Expected Progeny Difference (EPD) to more objectively evaluate livestock has been a means of selection by stockmen for many years. You can search through any purebred livestock journal and see pictures of livestock with their genetic profile (another name for EPD) right next to the picture. Recently, the Texas 4-H & Youth Development Program has implemented the use of EPD in livestock judging contests. This publication will provide a basic overview to county Extension agents, volunteers, and youth participants on how to effectively use EPD information with visual appraisal to logically place a breeding beef class.

The overall purpose of EPD is to compare the genetic merit of livestock based on specific traits. These traits can include birth weight (BW), weaning weight (WW), yearling weight (YW), milking ability (MA), total maternal, carcass cutability, carcass quality, gestation length, scrotal circumference, and pelvic area (PA). Breed associations are continuously developing data to establish more EPD categories and traits. For this publication we are going to focus on the most commonly referenced traits with regard to beef cattle in youth livestock judging contests. These include birth weight, weaning weight, yearling weight, and milking ability EPD. Selection decisions based on combining EPD with visual appraisal to improve decision making accuracy.

### BIRTH WEIGHT EXPECTED PROGENY DIFFERENCE

Birth weight has long been regarded as a major contributing factor associated with calving difficulty. Basically, the higher the BW EPD, the greater the calving difficulty is expected from the use of such sires. Consider the following example:

Bull	Birth Weight EPD
A	+5.0
B	0
C	-5.0

Imagine that a scenario says that these bulls will be mated to first calf heifers. Which heifer would you most likely prefer if this was all the information you were provided? You should have chosen bull C because this bull has the lowest BW EPD. This means bull C would have calves that will average five pounds lighter than bull B and 10 pounds lighter than bull A.

### WEANING WEIGHT AND YEARLING WEIGHT EXPECTED PROGENY DIFFERENCE

Weaning weight and yearling weight EPD are commonly referred to as growth data. These growth data are important because cattle are valued and sold by weight. Emphasis on positive growth EPD selection results in heavier calves returning more dollar value. Thus, larger WW and YW EPD have a positive economic impact on selection. Let's look at the example below:

Yearling

Bull	Weaning Weight EPD	Weight EPD
A	+12.0	+23.0
B	+6.0	+10.0
C	-8.0	-4.0

If the scenario tells you that the offspring of these bulls would be sold at weaning, which bull is the most desirable? The answer is bull A. This is the bull with the highest WW EPD. If you compared bull A and B's WW EPD, then you would say that bull A's offspring would be (on average) 6 pounds heavier than the average offspring from bull B at weaning. What if the scenario said the producer would retain ownership of the bull's offspring and they would be fed in the feedlot and marketed as finished cattle? Then, the YW EPD becomes more important. And the bull with the highest YW EPD will sire heavier offspring. Thus, bull A is still the correct answer.

### MILKING ABILITY EXPECTED PROGENY DIFFERENCE

Milking ability becomes much more complicated to explain. Without going into great detail, the basic formula involves measuring the additional pounds of weaning weight from daughters due to genes for milk. The following example should make this explanation clearer.

Bull	Milking Ability EPD
A	+8.0
B	-2.0

Notice that the difference in the MA EPD is 10 pounds. This does NOT mean that daughters from bull A produce 10 pounds more milk than bull B. It means that bull A's daughters would be expected to wean calves that average 10 pounds heavier because of genes associated with milk. So, which bull has a more desirable MA EPD? If higher milking ability is desired in daughters, Bull A should be chosen. However, if a scenario states that forage is low quality, then a high EPD for milking ability could lead to problems. Heifers and cows that have a high milk EPD will need a higher quality grass or supplement to reach these expected high maternal values. If the scenario dictates that forage is low quality, you should look for a lower value that is more beneficial to the scenario.

### WHAT IS A SCENARIO?

A scenario is the situation or environment that these cattle (bulls or heifers) are going to be placed into once the selection process is complete. In other words, it is how they will be utilized. You should always read the scenario or situation first, so you can determine what traits to emphasize when evaluating the EPD and the phenotype. Here are some example statements that might be included in a scenario.

- All offspring are sold at weaning.
  - This indicates that the weaning weight EPD should be emphasized heavily.
- These bulls will be mated to first calf heifers and their offspring will be kept as replacements.
  - This indicates that birth weight EPD should be strongly evaluated and that weaning and yearling EPD's should be considered as well. Moreover, since the scenario says that all replacements are being kept, then the milk EPD is important, too.
- Forage is low quality for the heifers.
  - This should indicate that moderate milking ability should be emphasized. Thus, a high milk EPD should be discouraged in the decision making process.

4. Forage and feed are high in quality and abundant.

- This signals that a high milk EPD should be emphasized.

5. The producer is retaining ownership through the feedlot.

- This indicates that the owner does not sell the castrated bull calf (steer) or heifer until after they are fed in the feedlot and go to harvest. Thus, growth data (weaning and yearling EPD ) are important. Specifically, the yearling weight EPD is by far the most important trait to evaluate in this scenario.

6. The ranch labor is limited.

- This means that there is no one there to pull calves if cows or heifers are having trouble calving. Thus, a low birth weight EPD in potential sires is much more desirable economic trait.

Any one or combination of these statements as well as many other situations can be described in a scenario. Always read carefully and try to understand how the cattle will be expected to perform in the described situation. That will help you rank them in the class.

Here is an example data sheet, please read carefully and select the most appropriate bull based on the questions below.

Bull	Birth Weight	Weaning Weight	Yearling Weight	Milking Ability
A	+1.2	+9.8	+13.7	+8.4
B	+7.0	+12.0	+21.4	-2.3
C	-1.5	+6.8	+24.1	+12.1
D	+0.4	+17.1	+34.3	+11.8
<i>Breed Ave.</i>	<i>+1.4</i>	<i>+8.8</i>	<i>+18.2</i>	<i>+4.7</i>

### QUESTIONS

1. Which bull would you suspect to have the poorest milking daughters?
2. Which bull has the most desirable data, if forage and feed are abundant?
3. Which bull concerns you the most in regard to birth weight?
4. Between bulls C and D, which bull would you most likely use on first calf heifers that are on a ranch with low quality forage and limited labor?
5. If these bulls were going to be placed on cows to produce offspring that will be retained through the feedlot until harvest, which bull would you be least likely to place first?

### ANSWERS

1. Bull B because he has the lowest milking ability EPD.
2. Bull D because the data indicate that his offspring will be the fastest growing at all stages and pass on the best milking genetics as evidenced by the highest milk EPD.
3. Bull B should scare you! A birth weight EPD of +7.0 is extremely high. When bulls have this high of a

birth weight EPD, they are typically going to produce major calving problems, especially on first calf heifers. If a cow can not have a calf, then it becomes an economic disaster. High birth weight bulls are major problems, no matter how much labor you have.

4. Bull C should be your answer. It has the lowest birth weight EPD and has a more moderate milk and EPD.

5. Bull A because he has the lowest yearling weight EPD.

## OTHER NOTES

Each beef breed has different breed averages for all EPD. These are usually greater than zero and change yearly. If you are provided those, simply see how they relate to the four animals you are evaluating on paper and on foot.

One common question always asked is, *“how much emphasis should be placed on EPD compared to the actual animals in the class?”*

EPD and visual appraisal should be combined to improve accuracy, but there is no preset percentage (but the EPD and the individual animal should coincide). In other words, the biggest, widest heaviest appearing bull should have one of the highest EPD for growth. It only makes sense that these should match. If they do not, then the class loses its educational value and not much is gained from the experience youth should get with regard to decision making and making sound judgement decisions. In summary, EPD in judging contests should assist youth in placing classes and help prepare them to understand genetic performance profiles. Ultimately, this training should increase their livestock knowledge and build confidence in making accurate decisions.

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