EPDs 101

Expected Progeny Differences (EPDs) are statistics that help us predict the performance ability of a sire or dam for certain traits relevant to beef production. Cattle breeders use EPDs to make comparisons between animals about their genetic potential. EPDs take into account an animal's performance data (their own and any related cattle), pedigree, and if available, genomic testing information in their calculation.

If we were comparing two bulls to buy at a Shorthorn sale, these are the EPDs you might see listed in the catalog:

Calving Ease Direct (CED): The CED EPD is listed as a percentage of unassisted calvings. A higher CED EPD predicts a sire that will have a higher percentage of unassisted calves.

Birth Weight (BW): Compares the differences in the weight of calves at birth. It is measured in pounds, and cattle with higher BW EPDs are predicted to produce heavier calves.

Weaning Weight (WW): The WW EPD is expressed in pounds and predicts differences in weaning weight of a sire's calves. Bulls with higher WW EPDs predict heavier calves across the scale at weaning.

Yearling Weight (YW): Just like WW, only at the next stage of life. The YW EPD is expressed in pounds. Higher YW EPDs are likely to produce bigger, heavier yearlings.

Milk (MK): The hardest trait to measure, since we don't measure milk production in beef cows. The MK EPD is measured in pounds of calf weaning weight due to his mother's milking ability. A higher MK EPD predicts that a bull will sire daughters who raise heavier calves due to their milk production.

Total Maternal (TM): Total Maternal EPD is a simple formula. TM= MK EPD + ½ WW EPD. It measures impact on calf weaning weight due to both milk production and the cow's genetics for growth. Bulls with a higher TM EPD should sire daughters with a bigger impact on their calves' weaning weight.

Calving Ease Maternal (CEM): Measures the ability of a bull's daughters to calves unassisted as two year olds. The higher the CEM EPD, the easier calving should be when a bull's daughters have that first calf.

Stayability (ST): Cows who work longer make more money. The ST EPD predicts the ability of a bull to sire cows that "stay around". The ST EPD is shown as a percentage of how much more likely a bull's daughters will stay in your herd to the age of 6. A higher ST EPD bull is more likely to have daughters stay around for a long time.

Carcass Weight (CW): The CW EPD is all about pounds of beef on the rail. Higher CW EPDs mean that a bull is more likely to sire feeders with heavier carcass weights.

Yield Grade (YG): The USDA Yield Grade scoring system is the unit of measurement for the YG EPD. Yield Grade 1 are leaner, more retail product carcasses. Lower, more negative YG EPD bulls are expected to sire calves that score better on the USDA Yield Grade scale.

Ribeye Area (REA): REA is measures the size of the muscle that gives us the ribeye in square inches. Higher REA EPDs indicate a bull is expected to produce larger ribeyes in their offspring.

Marbling (MB): The MB EPD is in units of percentage of intramuscular fat within the ribeye. Higher MB EPD bulls should sire higher marbling (and grading) feeder calves.

Fat Thickness (FT): Inches of backfat (in hundredths of an inch) is the unit of measurement for FT. More negative FT EPDs are indicative of a bull that should sire less backfat in his calves.

Selection indexes weight multiple EPDs with an economic value to create a simplified selection tool built to meet the goals of your operation. Whether it's production of superior replacement females, quality feeder cattle, or sleep all night calving ease, selection indexes combine the traits that drive profits to identify the Shorthorn genetics suited to meet your needs.

$Calving Ease ($CEZ): Genetics that you can trust to calve easy while keeping mature cow size in check. You'll sleep soundly and your heifers will thank you for selecting for high $CEZ sires.

$British Maternal ($BMI): A balanced, multi-trait index built to identify the ideal seedstock for crossbreeding on British breed cow herds. $BMI focuses on the traits you want in your cows: easy calving, maternal performance and moderate mature size, while keeping the growth and carcass merit in your steer calves.

$Cow Productivity ($CPI): An index focused on identifying the cattle that do the things we (and the Shorthorn commercial customer) expect of a productive momma cow: calving unassisted, raising heavy calves to weaning, keeping mature size in check, and staying in the productive herd for years to come.

$Feedlot ($F): For the cattleman who sees value in retaining ownership of feeder cattle. Growth, performance and carcass quality drive $Feedlot. Cattle bred to grow and grade excel in $Feedlot.

Accuracy

EPDs are able to give us an idea of what an animal can produce in our herd, but they aren't perfect predictors. They need information feeding the calculations to make them better. We use EPD accuracies to help us determine the reliability of an EPD. Accuracy is expressed as a value from 0 to 1, with higher values giving us more confidence in that EPD value.

The EPDs on a yearling bull start with a baseline of the average between his parents, a very low accuracy EPD (less than 0.20). As his data is recorded, his EPDs change to reflect his performance and his accuracy will increase. Genomic testing will further increase accuracy (up to about 0.40), but large volumes of progeny performance data are what lead to high accuracy EPDs on a sire.

	EPD Accuracies	
Very Low	Less than 0.20	Young cattle with little data
Low	0.21-0.40	Cattle with data and genomics
Medium	0.41-0.70	Young sires with progeny data
High	Greater than 0.71	Heavily used sires

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Performance with Purpose

EPD	Bull 1	Bull 2	Difference
CED	6	11	Bull 2 sires easier calving
BW	2.5	1.0	Bull 2 sires lighter birth weights
WW	58	49	Bull 1 sires heavier weaning weights
YW	93	85	Bull 1 sires heavier yearling weights
MK	22	26	Bull 2 sires cows who produce more WW because of milk
TM	51	51	Both bulls sire cows with equal impact on WW due to milk and growth genetics
CEM	7	10	Bull 2's daughters more likely to calve easily
ST	13	16	Bull 2's daughters more likely to stay in the herd
CW	15	5	Bull 1 sires heavier carcass weights
YG	-.33	-.39	Bull 2 sires better yield grad scores
REA	.31	.22	Bull 1 sires larger ribeyes
MB	.12	.19	Bull 2 sires more marbling
FT	-.11	-.14	Bull 2 sire less backfat