Terminology:

Using Expected Progeny Differences (EPDs) is the fastest way to make genetic improvement in beef cattle.
Breed associations calculate EPDs using vast amounts of data collected on economically important traits. The power of this data is tremendous. Performance information used to calculate EPDs come from combinations of the following:

1. The individual's own performance record
2. Progeny records
3. Records of other relatives in the pedigree (particularly sire and dam)
4. Genetic correlations of traits

As progeny records are added to a sire's record, the accuracy of the EPD increases and becomes more reliable. Breeders need to remember that EPD values are not exact and actual progeny differences will vary from the predicted EPD values. Therefore, breeders should use proven bulls with high accuracies more heavily than young bulls with low accuracies.
Armed with sire summary data, you can make breeding decisions based on documented records for a variety of traits and breed cattle that work in your program. Although the EPDs reported in sire summaries might vary by breed, most breed associations commonly report these traits:

Calving Ease, Carcass Traits, Grid Value, Birth Weight, Scrotal Circumference, Beef Value, Weaning Weight, Yearling Height, Weaned Calf Value, Yearling Weight, Stayability, Cow Efficiency, Milk, Feedlot Value

EPD - Expected Progeny Difference - The expected difference in performance of a bull's progeny compared to the performance of another sire's progeny. In other words EPDs for one animal are meaningless until they are compared to EPDs of another animal. For example, if Sire A has a birth weight EPD of 4.0 and Sire B has a birth weight EPD of -2.0, then calves from Sire B would be expected to average 6 pounds lighter at birth than calves from Sire A if the bulls are randomly mated in the same herd. EPDs are designed to compare sires within the same breed.

Acc. - Accuracy - A measure of reliability of an EPD expressed between 0 and 1.0. Accuracies closer to 1.0 means the EPD is a more reliable estimate of a sire's true genetic value for the trait.

% Rank - Based on percentages, this indicates where a bull's EPD ranks him in the entire population of his respective breed.

CED or CE - Calving Ease Direct is the difference in percentage of unassisted births when a sire is bred to first-calf heifers. A higher number is desirable.

BW - Birth Weight EPD predicts the difference in average birth weight of a bull's calves compared to calves of another bull. Reported in pounds, a lower number is desirable.

WW - Weaning Weight EPD predicts the difference in average 205-day weight of a bull's progeny compared to calves of another bull. Reported in pounds, a higher number is desirable.

YW - Yearling Weight EPD predicts the difference in average 365-day weight of a bull's progeny compared to progeny of another bull. Reported in pounds, a higher number is generally desirable.

YH - Yearling Height (Angus) - The YH EPD predicts the difference in yearling hip height of a bull's progeny compared to progeny of another bull. Reported in inches, ideal values vary depending on production environment.

SC - Scrotal Circumference - The SC EPD predicts the difference in yearling scrotal circumference of a bull's male progeny compared to progeny of another bull. Reported in centimeters, a larger number is desirable.

CEM or MCE - Calving Ease Maternal is expressed as a difference in percentage of unassisted births of a sire's daughters as first-calf heifers when compared to daughters of other sires. Reported as a percentage, a higher value is desirable.

Milk - The milk EPD predicts the difference in average 205-day weight of a bull's daughters' calves compared to the calves from daughters of another bull. Reported in pounds, ideal milk values depend heavily upon the nutritional environment of the herd.

MWW - Maternal Weaning Weight (Simmental); M&G - Milk and Growth (Hereford); TM - Total Maternal (Red Angus) - The EPD predicts the Weaning Weight of a bull's daughters' progeny and reflects both the milking ability of a bull's daughters and the growth potential of their calves. Reported in pounds, higher numbers are generally desirable.

$EN - Cow Energy Value (Angus), expressed in dollars saved per cow per year, the EPD assesses differences in cow energy requirements for daughters of sires. A larger value is more favorable when comparing two animals (more dollars saved on feed energy expenses). $EN savings differences account for lactation energy requirements and mature size of cows.

Stay - Stayability (Red Angus & Simmental) - The stayability EPD predicts the probability of a bull's daughters staying in production to at least six years of age compared to daughters of another bull. Reported as a percentage, a higher value is desirable.

Carcass Traits – EPDs for carcass traits are calculated using weighted averages of yearling ultrasounds and progeny carcass data.

CW - Carcass Weight - The EPD predicts the difference in hot carcass weight of a bull's progeny compared to progeny of all other bulls evaluated at a given endpoint. Reported in pounds, a higher number is generally desirable.

Marb - Marbling - The EPD predicts the difference in average USDA marbling score of a bull's progeny compared to progeny of another bull at a similar end point. Reported in degrees of a marbling score, higher values are desirable.

REA - Ribeye Area - The EPD predicts the difference in ribeye area of a bull's progeny compared to the progeny of another bull and is an indicator of total muscle in the carcass. Reported in square inches, larger numbers are generally desirable.

Fat - The EPD predicts the difference in fat thickness of carcasses, measured between the 12th and 13th ribs, of a bull's progeny compared to progeny of another bull. Reported in inches, lower values are desirable.

YG - Yield Grade (Simmental) – The EPD predicts differences in USDA Yield Grade of a bull's progeny compared to progeny of another bull. Reported in tenths of a USDA YG, lower numbers are desirable.

$Value Indexes (Angus):

Weaned Calf Value ($W), an index value expressed in dollars per head, is the expected difference in value of a bull's progeny at weaning compared to progeny of another sire. $W accounts for differences in birth weight, weaning weight direct, maternal milk, and mature cow size.

Feedlot Value ($F), an index value expressed in dollars per head, is the expected difference in value of a bull's progeny for post-weaning feedlot performance compared to progeny of another sire.

Grid Value ($G), an index value expressed in dollars per head, is the expected difference in value of a bull's progeny when sold on a carcass grid basis compared to progeny of another sire.
Beef Value ($B), an index value expressed in dollars per head, is the expected difference in value of a bull's progeny for post-weaning growth performance and carcass value compared to progeny of another sire.

Indexes (Simmental):

All-Purpose Index (API), expressed in net dollars returned per cow exposed, evaluates Simmental sires being used on the entire cowherd (bred to both Angus first-calf heifers and mature cows) with a portion of the daughters retained for breeding and the steers and remaining heifers fed and sold on a carcass grade and yield basis. With the exception of shear force (tenderness), all EPDs are considered in this index.

Terminal Index (TI), expressed in net dollars returned per cow exposed, evaluates the merit of sires when bred to mature Angus cows and all progeny are fed and sold on a carcass grade and yield basis. Consequently, maternal traits such as milk, stayability and MCE are not considered in this index.

$Value Indexes (Shorthorn):

$ CEZ – ($ Calving Ease) This index assumes a bull will only be mated to heifers, not cows. The potential profitability of the sire is measured by the incidence of live calves at birth. Moderate mature size is also emphasized in the index, but performance is not a priority. This index is also a good measure of Shorthorn females' ability to produce calving ease sires. Overemphasis of $CEZ may cause unwanted depression of weaning and yearling performance.

$F – ($ Feedlot) Similar to a Terminal Sire scenario, $Feedlot places strong emphasis on growth and carcass traits. This multi-trait index assumes the sire will be mated to a mix of heifers and cows and attempts to measure profitability when progeny are sold on the fed market. On the female side, mature size should be monitored closely when selecting for $F. Over-selection may cause detrimental harm to longevity, reproductive efficiency, and fleshing ability.

$BMI – ($ British Maternal Index) As the name implies, this multi-trait selection index attempts to measure a bull's potential profitability when complimenting the British cow base (Angus, Red Angus, Hereford, etc.). Shorthorn females can likewise be gauged at adding value to British or British-composite bulls of other breeds. A balance of growth and carcass traits is desired with a strong maternal component aimed at optimum reproductive efficiency and cow longevity

$Profit Indexes (Hereford):

Brahman Influence Index (BII), is a maternally-focused index based on using Hereford bulls on Brahman x Hereford cows. Emphasizes fertility, REA and IMF, with progeny harvested through a commodity market.

Baldy Maternal Index (BMI), is a maternally-focused index based on using Hereford bulls on Hereford x Angus cows with a progeny endpoint directed towards Certified Hereford Beef (CHB). Emphasizes fertility, CE, WW, IMF and REA with slight negative pressure on yearling weight to keep the mature size of cattle manageable.

Certified Hereford Beef (CHB), is a terminal sire index based on using Hereford bulls to sire calves for the CHB market. Some emphasis is applied to CE with positive pressure applied to WW and YW, IMF and REA. No emphasis is placed on fertility as all calves are harvested.

Calving EZ (CEZ), is a general purpose index that focuses on bulls that can be bred to heifers with resulting calves marketed through CHB. CE and MCE carry significant weight along with fertility. Little emphasis is placed on growth with less on carcass. This index is specifically designed to be used in a heifer program.

$Value Indexes (Red Angus):

HerdBuilder Index:

As the name indicates, implementation of the HerdBuilder Index will assist producers in building profitable herds. The HerdBuilder Index is built using the following production scenario:

- Red Angus bulls mated to cows and heifers (resulting progeny ¾ Red Angus, ¼ Simmental)
- Replacement heifers retained from within the herd
- All remaining progeny sold on a quality-based carcass grid.

GridMaster Index:

While Red Angus has traditionally been known as a superior maternal breed, those who have retained ownership in Red Angus calves know of their potential to excel in the feedyard and ultimately hang a premium carcass. The GridMaster Index is built using the following production scenario:

- Red Angus bulls mated to cows (resulting progeny ¾ Red Angus, ¼ Simmental)
- All progeny sold on a quality-based carcass grid.

Additional Terms:

Homozygous Polled - This individual is polled and carries two polled genes. The animal will sire all polled offspring regardless of whether the other parent is horned or polled.

Heterozygous Polled - The individual is polled but carries both a polled gene and a horned gene. The animal will sire both polled and horned calves.

Homozygous Black - This individual will always pass on a black gene for color to his offspring. When bred to a diluted cow, this bull can still sire gray color patterns.

Nondiluter - This individual does not carry the diluter gene and therefore will not pass on the diluter gene to his progeny.

Compiled from Current Sources – Year 2018

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