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What Is An EPD?

I just finished up fall breeding, luckily ahead of this cold snap. Breeding decisions are some of the most important and longest lasting made, in any livestock enterprise. Ask my family, I spend hours working through the art & science of mating decisions, trying to make the best possible, most informed decision. Much of this is done looking at the science side of the equation, by evaluating EPDs. Today we will discuss the general principals behind EPDs.

Expected progeny differences (EPDs) provide estimates of the genetic value of an animal as a parent. Specifically, differences in EPDs between two individuals of the same breed predict differences in performance between their future offspring, when each is mated to animals of the same average genetic merit. EPDs are calculated for birth, growth, maternal, and carcass traits, among others, and are reported in the same units of measurement as the trait (normally pounds). These values are to be used relative to each other and should not be expected to be actual values.

EPD values may be directly compared only between animals of the same breed or same genetic base. In other words, a birth weight EPD for a Charolais bull may not be directly, fairly, compared to a birth weight EPD of a Hereford bull. Having said that, there has been a good deal of work done in across-breed adjustment factors, coming from the USDA Meat Animal Research Center in Nebraska, reported through the Beef Improvement Federation (BIF) <https://beefimprovement.org/> Additionally, some breeds are working together to evaluate EPDs through the same software analysis, allowing more direct comparison. For example, the breed I raise is part of the multi-breed database with in International Genetic Solutions (IGS) allowing across breed comparison to breeds within that database.

EPDs are reported by most major beef breed associations and are calculated using complex statistical equations and models. These statistical models use all known information on a particular animal to calculate its EPD. This information includes performance data (i.e., weight records) on the animal itself, information from its ancestors (sire and dam, grandparents, etc..) collateral relatives (brothers and sisters), and progeny. In short, virtually all performance data that relate to the animal of interest are used to calculate its EPD. This continual influx of data accounts for EPD movement and accuracy values that increase as data increases.

These performance records are adjusted for such factors as age and sex of the animal, and age of the dam prior to inclusion in EPD databases. These adjustment factors allow performance records to be fairly compared in the analysis. Genetic merit of mates is accounted in evaluating progeny information, thus, progeny records are not influenced by superior or inferior mates. Also accounted for are the effects of environment that exist between herds. These environmental effects can be estimated due to the widespread use of artificial insemination. The common AI sires create genetic links between herds with differing environments and serve as the foundation for evaluation of performance data and EPD calculation across herds.

In summary, EPDs are a tremendous tool to be used to improve genetics within herds. Since the majority of the genetic progress within a herd is a direct result of sire selection, EPDs should be given careful attention when choosing sires. Be careful to avoid single trait selection, and give emphasis to the traits important to your herd - IE growth, carcass, maternal, etc... Additionally, EPDs should be combined with other selection criteria, including: confirmation, structural correctness and reproductive soundness, to determine which sires are most suitable for the operation. Down the road we will look at genomics and selection indexes in articles as well, as these relate to this discussion. I wish everyone a very Merry Christmas and blessed new year!