Biography:
Dr. Colin Palmer is an Associate Professor of Theriogenology (Animal Reproduction) at the Western College of Veterinary Medicine. Originally from Nova Scotia, Dr. Palmer worked in mixed practices in Ontario and British Columbia and has owned/operated a practice in Saskatchewan. Dr. Palmer along with his wife Kim and children Lauren, Emily and Carter run a herd of purebred Red Angus cattle under the KC Cattle Co. name.

A Breeder's ... Veterinary Perspective

Don't Give Up On EPD's

I have been hearing a lot of frustration from fellow producers concerning the reliability and real value of expected progeny differences (EPDs); some to the point that they are no longer including these data in their sale catalogues opting instead to focus on the performance data of the animal or to highlight in words just how good that individual or breed line has performed relative to their own herd or in the show ring. On one hand, I am very sympathetic and can appreciate the frustration when a weaning weight EPD declines 20 pounds or more seemingly overnight while a birth weight EPD increases by 2 pounds, yet on the other I am disappointed that a very useful technology that has been around for over 40 years is being tossed aside in favour of much less reliable selection tools. Worse still is that this is happening just when we are getting into genomically enhanced EPDs that are helping us improve the reliability and the accuracy of those numbers. Like it or not, we owe a lot to EPDs for getting our cattle herds to where they are today. Loosely quoting Jim Leachman who spoke at a seminar I attended over 20 years ago – "no genetic progress was made in beef cattle between 1880 and 1980"; "It was only with the development of EPDs that real genetic change was made possible". On their website the Red Angus Association of America reports that the average weaning weight of Red Angus calves actually declined during the 20 year period before the introduction of EPDs and has been on a steady increase since. Without EPDs it is difficult to determine what proportion of an animal's performance is due to its environment (feeding, management) and what is due to true genetic value; the only part passed on to the next generation.

So what is the root of the frustration? My belief is that lack of understanding of what the numbers mean, where the numbers come from and how to actually use EPDs coupled with large, often unfavourable changes in the EPD values for our must looked at traits is the cause. The current fluctuations in EPD numbers are mostly occurring in the Angus breed with the most disappointment amongst the Red Angus breeders.

Expected progeny differences are calculated using production data from the individual animal and from its relatives... half siblings, parents, grant parents and so on. My favourite trait to discuss is weaning weight (WW) – the calculation of the WW EPD utilizes a direct measurement from the individual and it is the most economically relevant trait for the cow-calf producer. Not only is the individual's weaning weight, but those of numerous relatives are included in generating the EPD number. Most genetic evaluations of the growth traits utilize multiple-trait analysis which accounts for correlations that occur between them. For example, birth weight, weaning weight and yearling weight are related and each will have an influence on the other in the calculation of EPDs. Data from ancestors, the animals own performance and data gathered from progeny are all weighted appropriately in the analysis model. Full siblings can be vastly different, although in theory they share 50% of their DNA; it is only when the performance data from progeny are gathered that we gain a reliable appreciation for which genes were present in the parent. More data translates to more accuracy. If producer, "Go-it Alone," does not submit any information to the breed association for several generations then EPDs generated will only be based on pedigree estimates using data gathered from other herds with related animals. "GoIt Alone" may produce the next great outcross bull with an outstanding phenotype, but those

numbers may change dramatically when progeny data is entered from several herds and the true genetic value of that animal is revealed. Heavily used artificial insemination (AI) sires will have the most accurate EPDs – accuracy is reported as a number between 0 and 1 with those closer to 1 representing a great accuracy. A highly accurate EPD will not vary much more and can be counted on to be a true representation of the genetic value of that trait. A highly accurate EPD does not mean that the calves will perform like clones for a particular trait, it simply means that the EPD number will not change much provided it stays in the same data base. Young, unproven sires usually have reported accuracies for the growth traits in the range of 0.40 to 0.50; however, the accuracy will improve steadily with continued input of data from his calves. Accuracies associated maternal and carcass traits EPD will naturally take much longer to improve.

Regardless of the trait, the actual EPD number by itself has little meaning. Touting that your bull has a +60 yearling weight EPD has no relevance unless you know the breed, breed database, and when that number was generated. The numbers are for comparing two animals within the same breed - database. For example, Canadian Angus Association, January 2020; or Red Angus Association of American, Fall 2019; or Canadian Hereford Association, Fall 2019. For your information (FYI) - numbers from different databases are not directly comparable! If you take the time, you can easily find bulls in the popular sire catalogues that are evaluated in both databases and not surprisingly the EPD numbers are different. A handy tip is to also look at how the animal stacks up in the percentile rank or (rank %) – if the rank percentage is 50 or greater it means the bull is below breed-database average for that trait. For the birth weight EPD, the higher the EPD, the greater the birth weight and the greater the rank %. Higher birth weight is not considered to be a good thing! In contrast, a rank % of 10 for WW means the bull is in the top 10% of his breed database for weaning weight which is a very good thing!

A straightforward exercise is to compare two bulls from the same bull sale catalogue or simply check that the database is the same. One bull has +50 weaning WW EPD and one has a +35 WW EPD. If each sired 25 calves the average adjusted weaning weight for the +50 sire group should be 15 pounds greater than that of the +35 sire. Will this happen in reality? No, it is not likely that you will see exactly a 15 pound difference in 25 calves because of many factors the simplest of which includes dam variablility, how the calves were managed (twins, pastures, feed resources, castration, implanting) and really just biological variability. However, when calf age at weaning, dam age, sex of the calf and other variables associated with contemporary group are accounted for the +50 WW EPD bull will have heavier calves than the +35 WW EPD bull and as more calves are produced by these bulls, and the accuracy improves, the more likely you are to see that the average difference in weaning weight is 15 pounds.

Most of the beef breeds update their EPDs twice a year. Recently, the Canadian Angus Association moved away from including red cattle in the Red Angus Association of America database to evaluating both black and red cattle together in the Canadian database. This resulted in a change in numbers which is to be expected as the baseline numbers would be different. The real positive is that Canadian Angus Cattle can be compared regardless of coat colour. Yes, the average black EPDs are greater than the average red EPDs for the growth and carcass traits, however, the average birth weight EPD is lower for red cattle and the milk EPDs are similar. As always, genetics from both colours can be sampled to improve cattle and directly comparable EPDs can facilitate this.