

EPDs and Classification how do they relate?

Kathleen Cullen & Dick Walker

Good question! Let's start with an explanation of EPD (Expected Progeny Differences). EPDs are about a male's ability to pass on a specific heritable trait to his progeny (offspring). So, let's say I have a male with fantastic luster and I want to know how likely it is for his superior luster to get passed on to the next generation. This would be valuable information to know when deciding which females to settle with this male. This is where EPDs come in handy as a way to take some of the 'guess work' out of sire selection. If we measure the luster of our male and compare it to that of his progeny, EPDs can calculate the positive or negative genetic impact our male had on his offspring's luster.

Luster, like all traits we see in our alpacas, is influenced not only by genetics but also by the environment. In determining the genetic merits of our male it is therefore important to factor out environmental considerations. EPDs are a powerful statistical tool based on the field of quantitative genetics. This technology takes measurable data (fiber diameter, luster, fleece weight, birth weight, etc) and applies a set of statistical equations. These equations are designed to discount the contribution of all inputs to a specific trait except the genetic component. The effects of environment, age, etc are therefore minimized and we are left with a **statistical prediction** of the **average improvement** we can expect in a males offspring for that particular trait.

We need to talk about statistics a little bit to understand how this calculation works. The term "statistically significant" is important here. It means the difference between **coincidence** and predictability. If I breed my male to 10 females and 6 of the offspring have fantastic luster, it may have been because of my male, but perhaps it was the quality of the females that made the difference. If I want to increase my confidence that my male was largely responsible for the offspring's fantastic luster, I need to breed him to enough females from various environments, so that **coincidence** can be mathematically (statistically) decreased. An EPD value can be calculated from a single breeding, however the **reliability** of that value for predicting the luster of his progeny would not be very high. As a male produces more and more offspring the EPD value may or may not change but the accuracy automatically improves with increased numbers. The calculation also includes the measurements of luster in a male's ancestors, and other relatives in addition to his progeny. Superior luster in those relatives mathematically increases the predictability that my male's genetic line does carry a very strong luster gene. In addition to luster, EPDs can be calculated for many **Quantitative** traits such as; birth weight, weaning weight, fiber diameter, and fleece weight. They can also be defined for **Qualitative** traits such as; lock style, head shape, and disposition.

EPDs aren't typically used for females because it would take too many years to gather statistically **reliable** data especially in alpacas since they only have one offspring per year. Any serious herd improvement strategy however requires that we identify not only our top males but females as well. This is where **classification** can be useful as an additional tool for herd management. Basic herd management starts with knowing the qualities of your individual alpacas, both their strengths and weaknesses, so you can make more intelligent breeding decisions. Classification involves taking measurements and visually assessing and scoring the conformation (body), fiber and movement (gait) of both male and female alpacas. For example:

body length, neck length, height, leg conformation and movement, head characteristics, proportions, fiber characteristics. Overall, about 60 items on an animal are assessed and recorded on a score sheet. Where EPDs focus on one trait at a time, classification is looking at all the major traits that your alpaca has. For Suri Classification the Suri Network has developed a classification score sheet based on the Suri Breed Standard. This system has been field tested over the past year on herds of all sizes and is working out quite well.

Once all these measurements are taken, you have a comprehensive assessment of each animal in your herd and knowledge of each animal's strong and weak points. With that information you can go looking for a herdsire that is strong where your female is weak and use him to compensate for that weakness. Once EPDs are available you can utilize them as a selection tool to find just the right male to maximize the likelihood of improving that weakness in the next generation. The goal, of course is to make the most informed breeding decisions possible and thereby increase the predictability of each and every sire selection. The importance of making these decisions correctly is very important for farms of all sizes but is especially important to the small breeder for whom every sire selection is a major decision. Consistent year after year improvement will increasingly depend on the adoption of these two separate but interrelated herd improvement tools.

EPDs and classification strategies have been used for many years with great success in cattle (meat and dairy) as well as other fiber industries to significantly improve the commercial value of these livestock breeds. Applying these technologies to alpacas has only been done on a very limited scale anywhere in the world. Once the US alpaca industry adopts this technology genetic improvements in those traits selected for EPDs will accelerate. The US alpaca industry should compete in the world market on the basis of quality, not quantity. Acceptance and industry wide application of EPDs are essential to becoming a world leader in Suri genetics.

For those interested in learning more about Suri Herd Classification and EPDs, there will be a seminar held in conjunction with the Suri Network Summer Symposium and Annual meeting August 13-16, 2009. Look for details at SuriNetwork.org. Also, for more information on EPDs, go to AlpacaAcademy.com for articles relating to this subject.