Why would you say EPD don't work?

Geneticist Sean McGrath dispels some common myths surrounding Expected Progeny Differences

I often hear the comment that Expected Progeny Differences (EPD) don't work. This is an interesting and unusual comment to someone in my field since EPD simply describe genetic differences between cattle. The "work" that EPD do is to inform seedstock breeders and/or their customers how progeny from available seedstock should perform relative to the rest of the population.

EPD do describe the genetics of cattle. I am privileged to work with a number of breeders in a wide variety of breeds, and the data reported by breeders fully supports the EPD in over 99% of cases. The exception would be where data may have been incorrectly reported and subsequently changed.

It is important to note that EPD cannot be compared across breeds. They also cannot replace the professionalism of your seedstock supplier. EPD are not "newfangled", they have been around for decades, although they've only really been commercially available for the last 2 decades or so.

So why do breders say EPD don't work? Obviously they would not make this comment unless there was some reason. I can think of 5 based on my experience.

1 LACK OF DIRECTION
— Often seedstock producers and their customers do not know what their overall goal is when they purchase a bull. This leads to a "bigger is better" mentality for many traits. Remember, for any trait in any breed only 1% of the population can be in the top 1% for that trait. Often cattle that excel in one trait are dismal failures in another. This may also be the primary reason why producers with average EPD are concerned or even denounce the system.

Does a producer using a bull to produce feeder calves need a bull with milk in the top 25% of the breed? Probably not. Does he need a bull with good post-weaning growth rate? Probably. "What is the role of this bull?", is a great question to ask. You may operate a herd where a bull must be multipurpose, siring replacements and feeder cattle. Some scenarios may require a more specific type of sire, such as in a terminal crossing situation, or a straight replacement heifer generating program. If you are putting cattle on the grid, then specific carcass characteristics such as marbling may become important in driving your profitability.

Having a written mission statement and a defined selection goal puts EPD into perspective as a tool to help achieve a specific goal. It also helps breeders determine how much emphasis to put on each trait. EPD cannot help breeders achieve a goal that does not exist. A written direction moves the focus from "more production" and "bigger EPD" to more profitability.

2 NO EPD FOR MANY IMPORTANT TRAITS
— This is true, and it is one of the greatest excuses not to use EPD ever invented. EPD don't represent every important trait in beef cattle production or selection, but they do represent many important traits. Calving ease, growth rate, longevity, temperament, and carcass characteristics are all good examples of traits for which EPD are available and they should be part of a selection program.

Data collection is currently ongoing in many breeds to be able to report several important traits to genetic evaluation. This includes such things as pregnancy rate, longevity and even feet and leg structure. As data collection and evaluation develops, more important traits are added all the time.

3 BREEDER INTEGRITY
— It is always surprising to me how breeders can question another breeder's data, and yet will buy a bull based on actual performance measures of a lone animal. The greatest effect any breeder's data can have is on the EPD for their own cowherd. As soon as cattle from a herd enter the general population (other breeders' herds) or a breeder uses external genetics (such as A.I.) the EPD are either reinforced or rapidly corrected for misreporting. In this respect they are much more powerful and accurate than a simple performance measurement such as birth weight.

Generally speaking, honesty among breeders is not an issue. Incomplete reporting is a much more relevant issue. For most major breeds EPD are calculated using the breed's North American database. Failing to report all cattle means that not all cattle can be compared. For example, trimming the bottom portion of the herd effectively raises the average and drags down the remaining upper portion of the animals in the herd.

Breeders need to focus on complete, and correct reporting of their own data to produce EPD that accurately represent the genetics in their herd. Customers need to ask whether or not their bull supplier participates in a genetic improvement program.

Unfortunately this is one of the most common excuses in use today. When producers look at an animal and the actual performance measures (example: 85 lb. birth weight) they are making a mental comparison of where that bull fits in their operation. Unfortunately what that producer cannot do using actual performance measures is accurately sort out management effects, determine actual genetic merit and assess where the animal fits within the entire population.

EPD are not presented using the typical scales cowboys are used to seeing. A weaning weight (WWT) EPD may appear as +20 pounds rather than 720 pounds. The important thing to remember is that EPD describe genetic differences in cattle, regardless of

environment. An animal with a +20 WWT EPD will sire calves that are 20 pounds heavier at weaning than a sire of the same breed with a 0 EPD. In some herds that may mean weaning weights of 680 vs. 660, in other herds that may mean 740 vs. 720. The important thing is the differences between animals.

A good practice is to look at the EPD profiles of cattle that work in a given scenario or on a given ranch. If Bull A produced heifers that were substantially better then bull B, look at the EPD of Bull A and select more bulls with similar profiles.

Seedstock producers need to give their customers some credit. Many, if not most, are very savvy business people and understand EPD. Failing to understand and provide the information is a disservice to potential customers and can limit marketing options.

4 EPD AREN'T ACCURATE — EPD have an associated accuracy value. This number indicates

how much information we have on an animal's true genetic merit. If the breeder has reported data, most yearling and 2-year-old bulls will have accuracies somewhere around the 30% mark. In cowboy terms, we think of a birth weight or a weaning weight as 100% accurate. That is what the animal weighed on that day. What the EPD tells us is how that animal's progeny will compare against progeny from our other sire choices within the breed.

The 30% accuracy EPD contains a lot more information than the 100% measurement, although it contains that information as well. For example, the Birth Weight EPD on a bull with a low birth weight, but a family pedigree full of high birth weight cattle will include information on the bull's birth weight, and on his high birth weight relatives.

While EPD can change as we obtain more information, the vast majority of animals will not see their EPD change, but will simply have increases in accuracy. Accuracy is a tool to tell us how much information is available on a bull and to

inform the user of the potential risk associated with using that sire. The risk of using a young sire does not change by using EPD instead of raw or adjusted performance measures, but it is quantified in the accuracy value.

These are pretty basic arguments that I run across repeatedly. EPD are not rocket science. They are based on data and the relative performance of animals raised in the same environment. It is the same process an optometrist uses to determine which lenses you need. "Is this clearer, or this one?" — but on a grand scale.

Breeders and their customers have selected a breed to help meet their targets for their operation. They need to be concerned with selecting cattle within that population that move them towards their selection goals. No one is forced to use EPD when making selection decisions, however moving towards defined selection goals is the one thing that EPD can help you do more effectively than any other tool currently available.

Where to from here?

There are significant

advancements occurring in animal breeding and genetic selection; new tools for DNA profiling, and EPD for new traits such as heifer pregnancy rates.

Selection index and decision support tools are also making their way into the industry and have real power as they boil down all of the relative genetic information into a specific management value based on relative profitability of potential seedstock. Early Canadian examples of this are the Herefords' Maternal Productivity Index, or the Charolais' Terminal Sire Value. Other breeds are rapidly advancing on this front as well. Advancements in computer technology are producing improvements in decision support systems that allow farm managers to sort through volumes of data on thousands of animals in a manner specific to enhancing the profitability of their own operation.

— Sean McGrath

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