By now, most everyone is familiar with DNA technology to some degree. We’ve all seen television shows that have used DNA data to capture the criminal or to prove parent-age of a person. The same technology is currently available in the cattle industry through several DNA testing companies. We now have the ability to not only determine “who’s the daddy of that calf,” but also to peel back the hide and genetically see how a calf is expected to perform for numerous traits. This industry has matured enough to provide suitable reliability at a reasonable cost for the commercial cattleman. So how should the commercial cattle producer embrace this relatively new technology?

First, ask yourself what goals you have for your beef cattle enterprise. Without sitting down and performing this critical step, it will be hard to decide which traits to...
emphasize within the herd. It will be difficult to find an animal that can excel in all traits. Therefore, you should pick the traits that will have the most economic impact on your operation and concentrate on them. Remember, it is not wise to perform single trait selection. A balanced selection approach will result in a cow that is more desirable for your ranch and subsequently a better calf for the industry.

The following are a few thoughts on how you can use the traits to identify a heifer that will become a profitable cow in your herd.

**DETERMINE WHICH TRAITS ARE IMPORTANT TO YOUR OPERATION**

These traits will be based on your marketing goals and endpoint. Are you marketing replacement heifers, and steers are a byproduct of your production system? Are you a 100 percent terminal operation that sells all calves at some endpoint before the packing plant? Or will you retain ownership and sell on a grid basis?

If you are breeding for replacement heifers, concentrate on the maternal characteristics (birth weight, calving ease maternal, calving ease direct, stayability, heifer pregnancy and docility), efficiency traits (residual feed intake and average daily gain) and carcass traits (marbling, ribeye area and fat thickness).

If you manage a terminal operation, you always buy replacement females and will sell before the calf goes to the packing plant, so concentrate mostly on maternal traits (calving ease direct and birth weight), performance traits (average daily gain, weaning weight and yearling weight). However, you should still have some selection pressure for carcass traits (marbling, ribeye area and fat thickness).

In my opinion, it is difficult to place equal selection pressure on the carcass traits and on the performance and maternal traits since you will be selling pounds of live product. It is difficult to get a buyer to truly pay enough for perceived carcass quality of the calf when not selling on the rail. Most times, the value of additional live weight will overcome any carcass quality premiums paid when selling a live calf before the feedlot phase of production. With that said, I believe it is good business to stay at least average or better for DNA carcass traits. Most breeds do a fairly good job of meeting industry expectations. The cow-calf producer should ensure the calf has the genetic potential to be profitable for the entire industry. The old saying is true, “A rising tide floats all ships.” Therefore, if one sector of the supply chain is not profitable, there is a trickle-down effect to those sectors that occur before it.

If you sell cattle on a grid basis, take a more balanced approach. You will need to pay attention to all the traits mentioned for terminal operations. However, you’ll also want to more closely consider carcass traits since you will receive the actual full value of the carcass since you are selling directly to the packer.

**SET ACCEPTABLE LIMITS FOR EACH TRAIT AND STAY WITHIN THEM**

Maximizing any one trait can be a mistake if you don’t consider the other traits that are economically important to the operation. If you have large-framed cows, overemphasizing calving ease direct and birth weight is not justifiable. Most Angus-type commercial cows already have enough milk built into them that going for the extremes is not justifiable. Middle-of-the-road story continues on next page
DNA values for milk are acceptable. Stayability has a low heritability estimate and can be impacted more so by heifer/cow management than DNA scores can currently predict. It’s important to consider, but placing emphasis of this trait over others may not be as impactful as one might believe.

UNDERSTAND THE GENETIC EFFECTS OF EACH DNA TRAIT AND HOW TO INTERPRET THEM

Just because you select an animal with a very high DNA score (10) for a trait does not mean the calf will exhibit that trait 100 percent of the time. Take calving ease direct (CED) for example. A DNA score of 10 has a 23.9 percent probability of being calving ease based on the factors used to develop this DNA score. A CED DNA score of 3 has a 5.3 percent probability of being calving ease. Therefore, if comparing two replacement heifers with DNA scores of 10 (23.9 percent) and 3 (5.3 percent), the numerical difference between the two probabilities (18.6 percent) is the relative difference between these two animals.

Likewise, a weaning weight (WW) DNA score of 10 (63.9 pounds) does not mean you wean off a calf that weighs 63.9 pounds heavier than current. If you compare a WW DNA score of 10 (63.9 pounds) to a score 3 (14.2 pounds), what you can assume is that the higher DNA score animal should have a calf that has a 49.7 pounds heavier calf at weaning.

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SET REALISTIC EXPECTATIONS OF THE GENETIC PROGRESS THAT CAN BE MADE

Management of the animal has a large impact on the ability of the animal to express its genetic potential. As demonstrated above, you should look at the relative differences between the DNA scores and how they translate in production values.

I do not recommend using DNA scores as the sole source of information for making selection decisions. Couple the use of DNA with all the other tools such as visual evaluation, history of the animal (how was she raised, vaccinations received, etc.), expected calving date, price, etc. Likewise, I cannot make the recommendation to use DNA to differentiate between two individuals that are fairly close in DNA score. However, DNA can be used to identify the outliers. Identifying those individuals that would be in the lower 25 percent, 33 percent or 50 percent of the DNA trait will help to remove those animals from consideration.

BOTTOM LINE: DNA CAN BE A USEFUL TOOL, BUT DON’T FORGET THE BASICS

DNA testing has become an economically viable tool that should be used when making selection decisions for commercial cattle producers. Without DNA, most producers are selecting their females the same way great-grandpa did back in the early 1900s — with limited empirical data, mostly based on anecdotal information and visual evaluation.

Oftentimes, the purchase decision on retaining or buying a replacement female is based on how she was raised and what she was bred to for her first calf. I encourage you to look further beneath the hide to know what genetics she can contribute to your operation, through every calf she has while on your ranch.

Remember, DNA testing is one of many tools that should be considered when making replacement animal decisions.

Finally, the best genetics in the world cannot overcome poor management decisions and environment. How an animal is raised and managed and the environment it lives in will allow the animal to either reach its genetic potential or not.