

Investing in Parent Verification

Parent verification uses DNA markers to exclude incorrect parent(s).

by *Leoma Wells*

A newborn bull calf awaits us on a chilly morning. What sire do we write down in the calving notebook? The answer is straightforward 90% of the time. However, experts estimate 10% of pedigrees are misreported.

Imagine that same bull calf goes on to be featured as lot 1 and the buyer pays \$25,000 for him. The buyer decides to collect the bull and submits a DNA sample. When the results come back, the bull does not qualify to the AI sire noted on his pedigree. Instead, DNA proves he was sired by the pasture bull. What is that phone call going to be like with the new owner?

animal. That on its own may be worth its weight in gold, or at least the animal's value.

Changing technology

As modern technology has evolved, the method used for parent verification has as well. As we moved from blood markers to microsatellites or short tandem repeats (STRs) and now to single nucleotide polymorphisms (SNPs), confidence in the technology has increased, while the cost has continued to decrease. Today, there are approximately 200 SNPs used to determine whether progeny excludes one or both parents. In

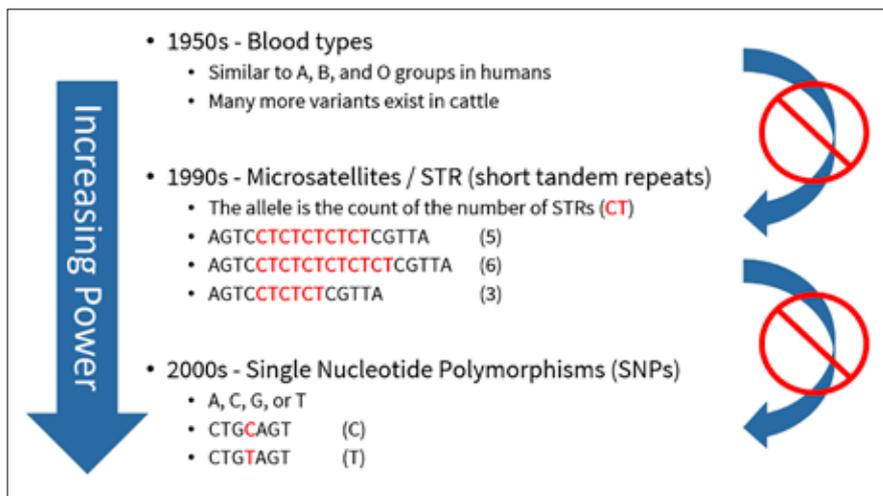
contrast, only 8-14 STR markers or 5-10 blood markers were used for comparisons (see Figure 1).

As different platforms become available, it is important to be aware that the different marker sets are not comparable to one another. For example, if you tested a sire with the American Hereford Association (AHA) in 2009, the bull would have STR parentage markers on file; whereas progeny tested in 2021 would have SNP parentage markers instead. Because of this difference in technology, the AHA would be unable to compare the SNPs to the sire's STRs. To rectify this, either the sire would need

to be genotyped using the GGP100K to receive SNP parentage markers, which would also add the bull's genotype to the AHA evaluation, or the progeny would need to be sent through STR testing for the comparison to be made.

Producers should feel very confident in the current GGP100K technology and its ability to accurately determine parentage.

Figure 1: The Evolution of Genetic Testing Technology



With parent verification included in every GGP100K profile, producers can easily locate these errors at an early age before the animal enters the herd or is sold. Being able to identify incorrect pedigrees via DNA testing becomes an insurance policy for your operation. A \$42 test can provide you with the peace of mind and confidence to fully promote and endorse an

The importance of parentage verification

If you are in the seedstock business selling bulls and/or breeding females, it is imperative to verify the pedigree is accurate. The genetic evaluation predicts the interim expected progeny difference (EPD) profile of the progeny based on that of its sire and dam. If the sire, dam or both parents are incorrect, the individual's EPDs will be impacted. For example, review the September *Hereford World* article on How Genomics Break the Tie. Commercial customers often make final selection decisions based upon critical EPD traits, such as birth weight, calving ease and milk.

Imagine selecting a bull based on his elite phenotype and EPD profile only to find out he may be vastly different than advertised. This error could have been resolved with a DNA test. If EPDs are used as selection tools, then parentage analysis is critical to maintain pedigree accuracy for both buyers and sellers.

Let's not leave out the commercial cattlemen wanting to capitalize on their genetic investments.

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The commercial cow-calf producer can benefit from implementing parent verification as well. Parent verification can be used in multi-sire pasture situations to identify which bulls are dominant, and if they are keeping heifers, determine which sires are producing the more desirable replacement females. The results always seem to shock producers the first year, as there tends to be one or two bulls that cover most of the females in a group. Armed with the parentage report showing which bulls are dominant allows the breeder to manage the bull turnout to ensure the best genetics have a fair chance of being distributed.

If you are currently calving fall cows or preparing to start with the spring crop, consider submitting DNA samples through the AHA. This strengthens the genetic evaluation and ensures the accuracy of pedigrees by providing parent-verified animals. **HW**

Editor's Note: Leoma Wells is the strategic account manager for Neogen Genomics.