

Genomics, Parentage Verification Explained

Workshop details how members can take advantage of DNA profiling and parent verification technologies.

by *Troy Smith, field editor*

During the 2016 American Angus Association Convention in Indianapolis, Ind., Jerry Cassidy, the Association's director of member services, talked about the improved predictive power of genomic-enhanced expected progeny differences (GE-EPDs). Speaking to attendees of a member workshop, Cassidy also discussed the application of genomics for parentage verification, and how parentage testing sometimes delivers a surprise. For example, it could reveal that a mating between certain animals did not produce the calf thought to have resulted from that mating.

Cassidy explained how traditional EPDs for a breeding animal are calculated on the basis of the performance of animals in its pedigree, its own performance and the performance of its progeny. Through DNA testing for the presence of gene markers associated with certain performance traits, genomic information can be incorporated into EPD calculations to improve the accuracy of prediction. Cassidy called genomics particularly useful for increasing the accuracies of EPDs for very young animals having few or no progeny.

"Genomics can make the predictive information on a 2-week-old calf as accurate as the information on an older animal with seven to 24 progeny," noted Cassidy.

Genomic testing for parentage is sometimes used by seedstock breeders and commercial cattlemen, perhaps most often when calves are born to cows that were or may have been exposed to multiple sires. However, some attempts to verify that a calf resulted from a specific mating between a registered cow and bull do not produce definitive answers. Comparing the calf's DNA against that of supposed dam and supposed sire sometimes results in an answer of "maybe" for both alleged parents.

According to Cassidy, when a calf is shown to possess gene markers possessed



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by the alleged dam, then the cow could be the mother. If the calf possesses markers possessed by the suspected sire, then the bull could be the calf's parent. The difficulty resides in the fact that animals of the same breed share some genetic material. So a calf may possess markers common to both alleged parents, but from which parent were they inherited? Either one might be the calf's parent, but one may not be.

"It is possible for a calf to match either potential parent, and the mating not qualify," said Cassidy. "This is a hard concept for many people to grasp, but the mating could be excluded."

Cassidy said situations resulting in mating exclusion, based on DNA testing, could come from using the wrong semen straw at the time of artificial insemination. It could also be the result of confused cows calving in close proximity, at about the same time, and "swapping" calves. In such cases, verification of the calf's parentage would require comparison of DNA from other possible parents and a search for markers providing the answer.

More information about the genetic services provided to members of the American Angus Association is available online at www.angus.org.

Cassidy's presentation was part of a series of half-hour workshops hosted Nov. 5-6 in the Angus booth within the trade show at the 2016 Angus Convention. To access the PowerPoint for this presentation, visit <http://bit.ly/AC16-Cassidy-genomics>. For comprehensive coverage of the Angus Convention, including speaker summaries, links to the full presentations, photos, videos and more, visit www.angus.media/news/Angus-Convention.

Editor's Note: *Troy Smith is a freelance writer and cattleman from Sargent, Neb.*

