MEMBERSHIP TIPS

by Jerry Cassady
director of member services

Parentage verification

There has been an abundance of recent discussion focusing on the issue of parentage verification, how our rules read and how they are enforced. Parentage testing, parentage verification, parents qualified, parents excluded … What does all of this mean?

I often hear members using these terms interchangeably, and I fear it may be an area of confusion. Let me try to clarify.

Using genetic markers for parentage testing is also known as parentage verification, and is based on each animal receiving one copy of each gene, called an allele, from each parent. We genotype animals to determine what markers were inherited, and then compare them to potential parents to determine if those markers are consistent with the individual in question.

The American Angus Association uses single nucleotide polymorphism (SNP) technology to genetically "fingerprint" each animal. More than 100 markers are used for this evaluation to give a level of accuracy necessary for a confident result. Understanding the basics of DNA testing is an important first step to knowing how parent verification might best be utilized.

Scenarios

Parentage testing technology can be used to confirm the accuracy of ancestral information in a pedigree. This can be especially useful when there is a tight gap between artificial insemination (AI) and natural-service bulls, and there would be potential for overlap of birth dates of resulting calves. A parentage test could clarify which calves are AI and which were born by natural service. Other scenarios using this technology include verifying matings for embryo transfer (ET) calves, and for producers utilizing multiple sires within the same pasture. Some progressive producers are using parentage verification on all animals born on their ranch. This becomes a marketing tool, providing an enhanced level of confidence for their customers.

One common misconception of parentage testing is that the test confirms parentage by matching offspring DNA to their parents. This is not the case. Rather, it is about excluding animals that cannot be the parents rather than proving that an animal is the parent. In the simplest terms, we use the genetic markers to exclude animals as a possible parent, leaving those remaining (hopefully only one) as the most likely parent for that offspring. If the potential parent shares the same markers, then that parent qualifies. If not, that animal is excluded as a possible parent.

Rules

The Association has established rules relating to parent verification (see definition of DNA Marker Typing). For example, all AI sires must have parentage markers on file

DNA Marker Typing – parentage testing effective date Jan. 1, 2019. In the context of parentage testing, DNA Marker Typing means the animal in question has had a blood, hair, tissue, semen, or other biological sample collected; DNA has been extracted; and the DNA used to determine the genotype for bovine parentage markers as defined by the International Society for Animal Genetics (ISAG). Extraction and genotyping must be conducted by an American Angus Association approved laboratory.

This definition applies to any sample submitted on or after the effective date. Furthermore, if the sire and/or the dam of the animal in question has parentage markers on file in the Association database, the markers from the subject animal and parents have been compared, and parents with parentage markers on file qualify as parents, both individually and as a mating when applicable, to the subject animal.

with the Association (see Rule 502 in sidebar). The same rule applies to donor females used for ET (see Rule 104.d in sidebar on page 80).

Animal cancellation

An animal will have their registration number canceled for parentage when a parent is excluded as a parent. Keep in mind that utilizing DNA can only address parentage markers in the previous

generation, meaning the parents of the animal being tested. It does not address previous generations in the pedigree. In addition, DNA parentage testing cannot guarantee breed purity. This technology can only determine if the two parents qualify based on the SNP markers evaluated. Once an animal is canceled for parentage, the animal will remain canceled until the parentage issue can be resolved with a qualifying parent (see Rule 103.b in sidebar).

Submit alternate parents

When submitting calves with unknown parentage, or if you use multi-sire pastures, it is highly recommended you test the calf for parentage prior to registering. At the time you submit the DNA sample on the calf for parentage testing, the calf will be assigned a temporary number in our system (BIR Number). The owner must then provide all possible sires by creating a sire group. This will allow the DNA to direct the system to the correct sire, allow us to make the correction on the calf's weight data, and then you can submit the registration application and then register the calf correctly.

This procedure will ultimately save you time, money and extra effort. To create a sire group, go to Member Login/My Herd/Animal Groups/ Create Sire Group. In the "Sire Group Identifier" box type in the name for your sire group. An example would be 2019 sires, North Pasture, etc. Click on "Add New Sire" and type in the registration numbers for your sires. Click on "Save" when finished. If you need to add additional sires you can do that by clicking on "Add Additional Sires." The final step includes checking out your cart, which submits the alternate parents

to the Association. Once you have checked out your cart, the process requires an overnight update of our system. Results would be available the following business day and posted in your Login account.

Why can't you just tell me who the parent is?

DNA testing can confirm parentage and exclude incorrect parents with a high degree of accuracy. However, in a large database like ours, false positive matches almost always occur. Some animals will match dozens of sires. Just because an animal matches on DNA doesn't mean it is the parent. We often have members send in DNA samples for parentage testing without providing any potential parents and want us to inform them of the qualifying results. Unfortunately, it just cannot work that way. For us to assign parentage to an animal, we must have a list of potential sires and dams provided by the breeder.

It's important we remain consistent with this requirement and that all possible parents be suggested only by the breeder. Then we can confirm if those potential parents match. Otherwise, we risk incorrectly assigning a parent because of a false positive match, when the actual parent may not even have parentage markers on file.

Cost and results

The cost for a stand-alone parentage test is $18; however, both of the genomic tests available for Angus producers (Geneseek Angus GS℠ and Zoetis HD50K™ Test for Angus) include the parentage test in the price of $37. Results can be expected within 3-4 weeks.
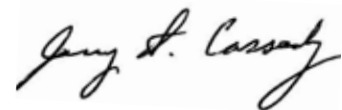
The only way we can test an animal for parentage is to have a viable DNA

Rule 502: DNA-Marker-Typing. All bulls that are the source of semen used for the purpose of Artificial Insemination must be DNA-marker-typed or must have been blood-typed before January 1, 2001.

Rule 104.d. Calves produced by embryo transplant. The Sire must be DNA-marker-typed or must have been blood-typed before January 1, 2001. The Embryo Transfer Donor Dam must be DNA-marker-typed or must have been blood-typed before January 1, 2001. Embryo calves resulting from the mixing of semen must be DNA-marker-typed.

Rule 103.b. Animals Ineligible for Registration. Uncertain or unknown parentage. Whenever the eligibility for registration of any animal is in doubt because of uncertain or unknown parentage, DNA-marker-typing or blood-typing by the Association shall be required. If through DNA-marker-typing or blood-typing the animal is found to have incorrectly listed parentage, the animal will not be eligible for registration unless parentage is confirmed.

sample on file. I highly recommend using this technology for peace of mind, knowing you are providing the best information possible to your customers. **AJ**

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If you have any questions regarding the issues discussed, please contact the Member Services Department at 816-383-5100.