

Striving for Sampling Success

Do's and don'ts for DNA sample collections.

by Kindra Gordon

“Take the time to do things right.” That’s a mantra most of us are taught as kids, and with experience, we usually learn that it carries weight.

It’s also a message Gayla Fuston, Angus Genetics Inc. (AGI) Customer Service team leader, wants to remind Angus breeders of when collecting tissue (with tissue sampling units or TSU), blood or hair samples for DNA testing to be used for analysis of parentage verification, genomic expected progeny difference (EPD) data, or genetic condition testing.

Taking the time to collect good samples helps ensure AGI is able to process and provide the information customers seek, Fuston explains.

Being on the front lines and seeing submitted samples come in, Fuston has her fair share of sad stories — from empty or mislabeled vials to improperly packaged envelopes that allowed the samples to fall out somewhere in the shipping process. Fuston says breeders can avoid most of these mishaps by following some important guidelines. Here, she shares best handling practices for collecting blood, hair or tissue samples.

Plan ahead for success

To start, Fuston suggests breeders consider their timing and allow for the ordering of materials needed to collect samples, as well as time for those samples to be submitted and processed. As a rule of thumb,



she suggests allowing six to eight weeks for ordering sample kits, and expecting three to four weeks to get data back from the lab.

Breeders can order DNA cards for blood samples, hair cards or TSU kits with vials for the ear notch sample. These can be ordered by calling the AGI office or online with a member’s AAA login. Unthawed straws of semen can also be submitted and used for testing on bulls.

Fuston notes the TSU samples can be the quickest option to collect chuteside because handlers can extract the tissue from the ear while vaccinating or other protocols are being administered to the animal.

Additionally, TSU samples are the only ones that bovine viral diarrhea (BVD) testing can be added to if conducting genomic testing.

Also, if a breeder is testing twins,

only a tissue or hair sample can be used. Blood samples from twins do not work because the blood is a mix of the twins.

Additionally, if planning to use a sire for artificial insemination (AI) or a female as a donor dam, Fuston advises collecting your samples on those animals to ensure you can register progeny once they arrive.

Sampling do's and don'ts

Animals can be sampled at any age, but Fuston notes hair samples on calves younger than 4 months of age are not recommended.

For blood samples, Fuston suggests recording the animal’s tag number and/or tattoo identification (ID) on the DNA card, then wiping the ear area clean with a towel before pricking a vein in the ear with a sterile needle to draw blood to the



surface. Touch the circle on the DNA card to blood site of the ear to saturate the circle with the blood sample.

Then, allow the card to dry away from direct sunlight for 24 hours prior to mailing. Regarding the don'ts with this process, Fuston says no chemicals should be used to wipe the ear clean and the DNA card should not be stored or mailed in a sealed plastic bag.

For producers who use a tail bleed in to collect blood for DNA sampling, Fuston says, "If you are doing this, be sure to utilize sterile equipment to avoid contamination, and also be sure not to oversaturate the blood card."

With hair samples, Fuston again advises recording the animal's tag number and/or tattoo ID on the hair card, then using pliers. Pull up and away from the tail switch in order to collect 20 to 30 strands of hair with the root ball at the end. The hair card is sticky on one side. The hair root ball — which is the most important part of the sample — should be placed on the back flap of the card, and then the sticky side can be folded and pressed against it to adhere the hair to the card. Any excess hair beyond the edges of the card can be trimmed and discarded. Simply cutting a sample of hair from the animal and adhering it to the card is not sufficient to process the sample.

For TSU samples, use a damp towel

to wipe excess dirt from the ear. Make sure the tissue applicator is loaded with an unused tissue punch, then position the applicator 1 inch from the edge of the ear, avoiding veins. Squeeze the handles with just enough force to pierce the ear, doing so in one swift motion. Don't use as much pressure as you would when tagging a calf, Fuston adds. Then remove the punch from the applicator, and check that the sample has been successful. Fuston says you should see both a green and red ball in the vial.

Once the tissue sample has been collected, the product can be stored at room temperature for up to two weeks prior to submitting to the lab. If samples are going to be kept longer, they should be stored in a refrigerator or freezer.

With TSU samples, Fuston says some cautions include: don't sample wet newborn calves because the placenta fluid could cause a failed sample; don't use chemicals to clean the ear because the chemical or bleach may degrade the DNA; don't position the cutter over any tattoo ink; and don't forget to look and make sure tissue is present in the vial. Fuston says samples should not be left in direct sunlight or heat, and

they should not be kept in auto-defrost freezers for long-term sample storage.

Also important with the TSU sample process is ensuring the samples clearly identify which sample goes with which animal. AGI has a spreadsheet for breeders to record the animal's tag number and the corresponding bar code on the TSU sample vial.

Mail with care

Finally, Fuston emphasizes breeders' samples are valuable and should be mailed to ensure safe delivery. TSU or semen samples should be mailed in a padded bubble envelope or box. If time is of the essence to get the data back, the samples should be mailed overnight or priority with a tracking number.

Additionally, Fuston says TSU samples should be mailed with the corresponding spreadsheet identifying the samples. As well, that spreadsheet should be uploaded in AAA login. All DNA samples, regardless of type, should be accompanied by an order confirmation to expedite the testing process. Samples arriving at the Association without an order confirmation are subject to delays.

The animal's registration or beef improvement record (BIR) number is required to process TSU, blood or hair samples. For animals that are not registered, breeders should include the tag number, sex, date of birth, registration number of the sire and dam, and requested testing. For parentage verification, including a list of all possible sire groups can help provide quicker results.

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Q&A with South Dakota Breeder Lee Kopriva

In northeastern South Dakota, Lee Kopriva and his father, Jim, run a seedstock Angus operation. They rely on DNA testing to enhance their herd and provide data for the bulls and females they offer customers each May in their annual DVAuction video production sale. Here, Lee answers questions about the value he sees from their DNA collection efforts.

Q Which type of samples do you collect (blood, hair, tissue), and do you have a preference for one over the other?

A We started collecting blood samples on blood cards as this was the best way to archive samples early on. However, with the advancements in tissue sample units and the ease of collection, we have switched solely to TSUs. We had used hair samples for twins, but now TSU samples can be used [for twins]. I really like how quick and simple the Allflex tissue collection tagger works. We get a neat clean sample that is safe in the sample vial.

Q What type of data do you want to get from DNA sampling?

A We like to verify parentage in addition to running the AngusGSSM profile to increase the accuracy of the EPDs, which provides more confidence and less guesswork for unproven young animals. By running the AngusGS analysis, it is reassuring that non-parent animals can be proved up as if they had already sired more progeny than they could with natural use in one season for several traits.

Additionally, because we run multiple-sire breeding pastures, which allows us to better utilize and manage our grass efficiently, having the ability to verify sires works well. We can also see which bulls are siring the most calves.

As well, we have had neighboring bulls crawl into our pastures a few days before we turn in bulls, so luckily in this instance, the traveling bull had parentage on file. There is also the occasional chance that cows calve at the same time and swap calves, so being able to confirm parentage before registration is important to eliminate surprises later on.

We are also able to test for persistently infected BVD with the same TSU samples. Previously, we would have collected ear notches and sent them off to a different lab.

Q Is there a certain time of year that you have found best to collect samples to fit with your management?

A We usually let the calves get off to a good start and collect samples midsummer when we are running them through a chute. We also collect samples at weaning time when we are taking weaning weights. The earlier the samples are collected reduces the chance for an ear tag to be lost. Also, testing earlier allows the breeder more time to use the data to make keeping and selling decisions.


Q What do you find most challenging or cumbersome about collecting your samples?

A The TSU collection process is simple and quick. We record the sample numbers and animal ID on paper, however the TSUs are smart-coded, and an electronic wand could be used to scan, helping to keep the information organized and have less chance for mistakes or error. It would work best having a person who can solely collect samples while running them through the chute. However, with a two-man crew, we are able to run them through timely since the TSU collection process is so simple

and quick. After the samples are collected, the process is fairly smooth to submit the samples for testing as long as the animal has been enrolled in the electronic calving book or has Angus Herd Improvement Records (AHIR[®]) calving/weaning data turned in. Make sure when mailing in the TSU samples to put them in a box with bubble wrap, as they could get damaged in mail using regular mailing envelopes. Regardless of the chosen sample method, there is a very small incidence that a sample would fail and a new sample will need to be collected and sent in.

Q Any tips you'd offer to other breeders about the sampling process?

A I would encourage breeders to start by testing a few animals. I think with the technology that we have available, verifying parentage is a must for breed purity. Since we started testing animals, we have been able to increase our certainty that an animal is who we say they are. With the number of animals that we have tested over time, we have been able to correct parentage issues, which do happen occasionally.

When collecting samples make sure that the ear is dry, free of dirt and dander to ensure that a good sample is being taken. Double-check animal ID numbers and TSU sample numbers to reduce the chance of error when submitting samples. 

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