

The Angus Profile

AGI President Bill Bowman answers questions regarding the practical use of the Igenity® Angus profile and its incorporation into genomic-enhanced EPDs.

by **SHAUNA ROSE HERMEL**

In September, the American Angus Association (AAA) and Merial began offering an Angus-specific DNA profile to Angus members. Results of the Igenity® Angus profile will be incorporated into the Angus genetic database and used in the December running of the Spring 2010 National Cattle Evaluation (NCE) to provide Angus members genomic-enhanced expected progeny differences (EPDs).

Angus Journal visited with Bill Bowman, director of performance programs and president of Angus Genetics Inc. (AGI), about the new technology and what it has to offer members and their customers.

Why did the Association pursue DNA technology?

In our 2000 long-range plan, the Association set as a goal to aggressively evaluate programs that would permit incorporation of DNA technology into the genetic evaluation process. The AAA Board has continued to follow the development of DNA technology and how that technology could ultimately be used in genetic improvement. Historically, incorporating the use of science and technology to provide the beef industry with reliable information characterizing Angus genetics has remained a focus for the American Angus Association.

DNA has been on the radar for a while. In the past, the Association has been slow to promote its use in genetic selection. Why the change? Why now?

Early use of DNA to make genetic selection focused on the use of a single gene and its effect on a single trait, though multiple genes affected the trait. A limited amount of the genetic variation was accounted for with some of those early tests, and the correlations to the measures were many times fairly low or inconsistent. Today's

profiles utilize multiple informative SNPs (single-nucleotide polymorphisms) for a trait and, therefore, can account for a much larger portion of the genetic variation.

The evolution of the technology has also created an environment to allow the industry to consider how best to utilize the technology. The thought process has moved from developing independent selection tools using the genomic information to incorporating the genomic information into NCE procedures. The Beef Improvement Federation (BIF) has provided some guiding philosophy on the use of genomic information:

BIF believes that information from DNA tests only has value in selection when incorporated with all other available forms of performance information for economically important traits in NCE, and when communicated in the form of an EPD with a corresponding BIF accuracy. For

some economically important traits, information other than DNA tests may not be available. Selection tools based on these tests should still be expressed as EPD within the normal parameters of NCE.

The technology is bound to evolve. Will the Igenity Angus profile still have relevance five years down the road?

The continued expansion of panels to include more markers and more traits will further enhance the use of DNA into the selection processes. The Igenity Angus profile will continue to evolve to include additional traits, especially novel traits that are not currently analyzed with traditional performance data.

Is the Igenity Angus profile the only DNA data being incorporated into the Angus database?

At this time the Igenity Angus profile processed through AGI will be the initial molecular data incorporated into the NCE to generate genomic-enhanced EPDs.

Can I use another DNA test?

Yes. In no way do we want to discourage you from your existing breeding plan and the use of current technologies you have in place. We encourage breeders to select genomic service providers that they find are the best fit for their program. That information just wouldn't be incorporated into the database for inclusion into EPDs at this time.

Why did the Association choose the Igenity Angus profile?

This initial project is the result of some four years of development and two years of collaboration with Igenity to incorporate the DNA information into our genetic

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Getting Started

- 1. Order FTA cards for use with blood samples**
[Click here to place an order.](#)
- 2. Collect Blood Samples**
The preferred method of collection and submission is the FTA card. DNA samples can be collected using hair cards or tissue tags from AGI. Samples can be collected at any age.
- 3. Animal Data**
If animals have not been registered or submitted through the Electronic Calving Book or AMR, submission is necessary before AGI DNA requests can be ordered.
[Click here for Electronic Calving Book](#)
[Click here for AMR Calving/Wearing Data](#)
[Click here for EZ Registrations](#)
- 4. Order the IGENITY® Angus Profile**
 1. Create a file of animals and complete the profile order.
 2. Submit the completed file through the AAA Login cart check out.
 3. A confirmation email will be sent upon receipt of order.[Click here to submit your file of animals.](#)

DNA Test	Price
IGENITY® Profile	\$65.00
Add BVD PI	\$3.00
Add Coat Color	\$4.00
Add AM Test	\$24.00
Add NH Test	\$6.00
Arthropoiesis Multiplex (AM) Test Only	\$26.00
Neuropathic Hydrocephalus (NH) Test Only	\$26.00
- 5. Mail Samples to AGI**

AGI:
3201 Frederick Avenue
Saint Joseph, MO 64506
(816) 363-5100
- 6. Profile Results**
[Results will be available and posted on AAA Login under view work history.](#)

Step-by-step procedures for submitting a sample for profiling are available through AAA Login, available at www.angusonline.org.

collaboration with Igenity to incorporate the DNA information into our genetic

(Continued on page 2)

The Angus Profile (from page 1)

evaluation system. Scientists in the beef industry have discussed the methodology for incorporating genomics into EPDs, particularly at the recent BIF meetings. In our collaboration with Igenity, we had to analyze the relationships between phenotypic measures and the genomic pieces.

The pipeline created to submit the DNA samples to the Association, where it is associated with the animal information, creates a platform Angus breeders can use with confidence. With samples arriving initially at the Association, a unique paper trail is developed for each animal. This allows a seamless transition of genomic results back to the AAA Login and ultimately the various genetic evaluations for Angus cattle.

Will the Association include other genetic panels into its genetic evaluation down the road?

For now, the research collaboration and Angus-specific panel provide for a natural place to start with the technology using this initial panel. Continued research to develop methodology that allows for the incorporation of multiple panel results is a focus of the industry in the near future.

If I'm a member, do I have to do the DNA test to register my cattle or to get EPDs?

No. The use of the DNA profile information is purely an option that producers can use to gather more information on their animals. Just like submitting other performance data, this is a voluntary program that is not tied to registration requirements.

What is the advantage of conducting the genomic profile?

The genomic profile provides a producer an opportunity to capture additional performance information on their Angus cattle. This information can be collected early in an animal's life, and it enhances selection tools so decisions can be made with more confidence, by both the breeder and ultimately the purchaser of Angus genetics.

The additional information and improved accuracy values will provide a continued confidence in the Angus genetic tools. A commercial producer using nonparent bulls with genomic profiles now has more insight into the genetic merit of these bulls, when only pedigree-estimated EPDs were previously available. This will be particularly important in traits that are more difficult or expensive to measure.

Molecular data from animals in limited contemporary groups still will contribute as additional performance data used in interim

EPDs and the NCE. If animals are profiled early in life, prior to any phenotypic measures, for example, then breeders are still able to receive selection tools and even EPDs for some traits in a faster time frame.

What traits will be affected?

Initially, the carcass traits (marbling, ribeye area, fat, carcass weight) will have genomic-enhanced EPDs. As additional evaluations are transitioned to accommodate the profile results, the EPDs will be incorporated into those evaluations as well.

The profile material lists other traits as being included. If those traits are not included in EPDs, how will that information be presented?

The profile scores will be reported on the traits until the genomic-enhanced EPDs are developed. More information about the scores and how to interpret them can be found on www.angus.org.

What will it cost?

The Angus-specific panel will be available to Angus breeders through AGI at a profile price of \$65 per animal. This genomic profile includes 14 traits: heifer pregnancy rate, docility, stayability, maternal calving ease, marbling score, ribeye area, fat thickness, carcass weight, tenderness, percent Choice (quality grade, QG), yield grade (YG), average daily gain (ADG), yearling weight, and feed efficiency. Additional options, such as testing for arthrogryposis multiplex (AM), neuropathic hydrocephalus (NH), coat color or the presence of bovine viral diarrhea (BVD) can be purchased by breeders.

Is parentage an optional add-on to the Igenity Angus profile?

At this point MMI is still the provider for parentage verification to meet the rules for AAA regarding artificial insemination (AI) sires and embryo transfer (ET) donors.

How do I submit a sample?

Members can purchase DNA cards online through their AAA Login account or by contacting the Association office at 816-383-5100. Use the FTA cards to collect blood samples, following prescribed procedures. In order to purchase genomic profiles for animals in your herd, these animals need to be identified in the Association database. A simple avenue to establish identification information on your calves is through a new feature called the electronic calving book, which is available through AAA Login. Next, breeders can submit the profile order online through their AAA Login account and mail the samples to Angus Genetics Inc., 3201 Frederick Ave., Saint Joseph MO 64506.

Pricing for DNA profile

DNA test	Price
Igenity® Angus Profile	\$65.00
Add BVD PI*	\$3.00
Add Coat Color	\$5.00
Add AM Test	\$24.00
Add NH Test	\$9.00

AM Test Only	\$26.00
NH Test Only	\$26.00

*Requires ear-punch sample.

Source: Angus Genomic Profile Orders page of AAA Login (www.angusonline.org).

We'll match the samples to the profile orders, matching the Angus ID to a barcode ID that will be sent to Merial with the DNA sample. Merial will process the profiles, sending the results back to AGI.

How long will it take to get a sample processed — from the time I pull DNA on an animal till the information is incorporated into an animal's EPD?

Allow three to four weeks for the sample to be sent to AGI until the results are available in the animal's EPDs.

If I use the DNA profile, should I quit taking weights and other phenotypic measures?

Phenotypic data are very valuable to continued enhancement of selection tools and improvements in future genomic panels, so we encourage their continued collection. One of the benefits of our EPD system is that a variety of information (phenotypic measures, genomic values, pedigree) can be evaluated simultaneously to allow the prediction of progeny performance, and the corresponding accuracy values inform cattlemen how much confidence they can place on the progeny prediction.

The *Spring 2010 Sire Evaluation Report*, available online in December 2009 and in print January 2010, will be the first to include genomic-enhanced EPDs. Nov. 6 is the deadline for submitting performance information for that evaluation, and producers should keep in mind the three- to four-week time frame needed to process the samples.

For more information about the genomic-enhanced EPDs available from the American Angus Association, contact your Angus regional manager or call AGI at 816-383-5100.

