



Parentage to Tenderness

MMI Genomics' DNA tools target added value.

by Barb Baylor Anderson

Breeding may not be an exact science, but using MMI Genomics' DNA-based breeding selection tools may move the Angus industry one step closer. For the last several years, the genomics technology research-and-development company has established successful results with its DNA products, including the parentage verification tool used by the American Angus Association. New desirable meat trait products are also now available.

"Our rationale is to create value for the majority of the genetic variation in the cattle genome," says Tom Holm, business development manager for MMI Genomics. "We are working with quantitative traits and perhaps 100 genes per trait in some instances. Application of the technology

allows producers to enhance their selection and breeding."

Specifically, MMI's Tru-Parentage™ test provides fast, accurate determination of parentage and verification of artificial insemination (AI) sires, natural sires and sires used in multiple-sire pastures. Producers can DNA-validate pedigrees vs. blood-typing for any animal and use the information to fine-tune their breeding programs.

"Tru-Parentage is not a trait test; it is a quality control for your purebred pedigrees," Holm explains. "DNA parentage verification

allows you to sell your pedigree, increase your breeding accuracy and decrease the traditional genetic selection time."

Sam Johnson, Summitcrest Performance

Angus, Summitville, Ohio, has been using MMI Genomics' products for about two years.

"We use Tru-Parentage

for donor dams and potential AI sires, and find the information is helpful and conclusive," he says. "Doing the testing means the information we communicate to our customers is that much more reliable. We can tell customers our bulls have specific parentage and have more accurate EPD (expected progeny difference) projections. The pedigree information is third-party verified. DNA provides specific and accurate verification."

Carcass characteristics

MMI Genomics last year introduced Tru-Marbling™ and Tru-Tenderness™ trait breeding tools. The products stem from a \$25-million collaborative research and development project with Cargill that began in 2002 with a focus on growth and carcass traits.

"Tru-Marbling and Tru-Tenderness account for a substantial proportion of the genetic variation of both of these traits. Producers who use these products can make early breeding decisions that increase the accuracy of their selection of bulls for these traits and decrease the age at which animals can be selected," Holm says.

Performance of both has been validated in Angus cattle. Tru-Marbling contains 128 DNA markers, where each marker is highly

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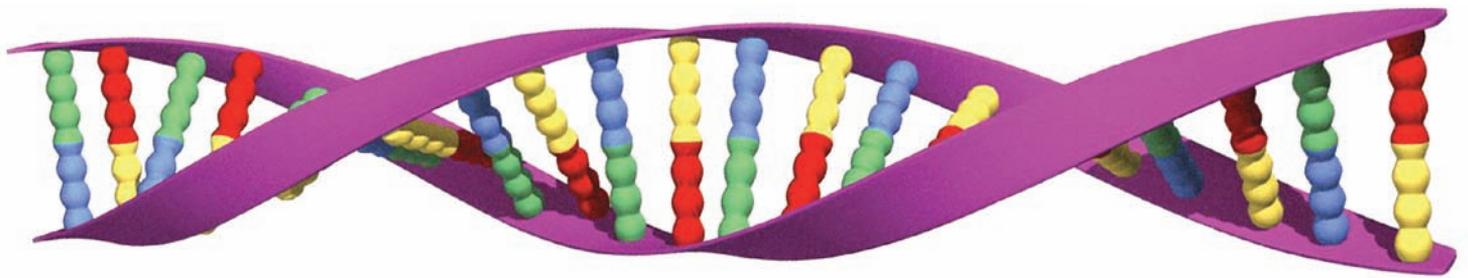


PHOTOS BY MATHEW ELLIOTT

▶ "Our rationale is to create value for the majority of the genetic variation in the cattle genome," says Tom Holm, business development manager for MMI Genomics.



▶ DNA testing for multiple traits, including marbling, adds value to the Summitcrest operation and the seedstock they sell, says Sam Johnson of Summitcrest.



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associated with expression of marbling score. Tru-Marbling measures cumulative effects of all the markers in an animal of any age. Results are expressed as molecular genetic value (MGV), a ranking system for genetic potential.

“The MGV is not a single number or an EPD, but it is used like an EPD to rank animals for breeding,” Holm explains. “Tru-Tenderness results are also measured by MGV. The test measures the cumulative effects of all 11 markers associated with meat tenderness.”

Johnson calls Tru-Marbling “the best genetic testing for marbling available. . . . It appears more accurate than either ultrasound EPDs and/or EPDs developed from carcass testing. We compared MGVs and EPDs of sires. We looked at marbling EPDs, IMF (intramuscular fat or marbling) EPDs, and ultrasound and actual carcass data of progeny. MMI’s MGV was far superior in predicting actual results.”

Johnson appreciates that the testing results are absolute and not subject to random chances of mating, or to phenotypic or management differences.

“An individual animal may not (ultrasound) scan well on a particular day, but the DNA results are precise and repeatable at any time,” he says. “Ultrasound is more demanding and must be done within a specific time period and within properly structured contemporary groups. DNA testing can be done at any age to any animal and can be compared to any other animal regardless of breed or phenotypic management group.”

With such accurate information, Johnson says test results are a sound marketing tool for Summitcrest cattle. “We can produce

economically beneficial traits with assurance the trait(s) passed on to our customers will help them make better, informed marketing decisions,” he says. “They have more details to market calves and manage risk. They can also use the information to seek out value-added marketing alliances for their cattle.”

Johnson believes DNA testing for

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— *Sam Johnson*

multiple traits, including marbling, adds value to the Summitcrest operation and the seedstock they sell, even with the added cost. He has used DNA to identify values for bulls, with estimates of \$10,000 differences between bulls over their productive lifetimes. He also calculates and identifies with DNA a \$40-per-head advantage for feedlot efficiency

over average calves, and believes he can increase stocking rates 15%-18% and raise profits \$100 per calf through DNA-assisted selection. That may not be achievable with current EPDs, he adds.

“You can raise more beef with fewer inputs and with a higher value,” he says. “For tenderness, it’s hard to discern market value for the trait. But if we can help eliminate the 10% to 20% of tough carcasses that depress the entire beef market, everyone benefits.”

Mike Siemens, director of animal welfare for Cargill, says that is the type of information that helps any producer. “Many people look at bull sales for help improving the quality of their herd,” he says. “These tools help level the playing field for smaller producers and provide an opportunity to buy a younger bull you know has genetic potential.”

That information can be both bad and good news for the Angus industry.

“If I have an unregistered bull to sell,” Johnson notes, “with DNA testing I can show the value of the bull is comparable to a registered bull. It mitigates the value of pedigrees to some extent because you do not need to infer from the parentage on the pedigree if the needed traits are present. With DNA, we’re no longer searching for a needle in a haystack.

“Our industry has a head start, but we need to be aggressive in using these tools,” he continues. “We have done the testing, developed feed-efficient, better-marbling animals. Now other breeds and commercial cattlemen can see our results and do the same.”

Johnson is optimistic DNA selection tools offer a bright future.

“There are many more markets out there, and I am highly encouraged Angus producers can stay in business a longer time,” he says. “For *Certified Angus Beef*[®] (CAB[®]), we can identify bulls at a higher rate, move more beef to a higher acceptance rate, export more and license more restaurants. At the same time, we don’t want to lose our focus on other production factors. DNA is not a magic bullet; it is part of a multidisciplinary approach to production.”

Easy test

Producers interested in MMI Genomics’ tests can call 1-800-311-8808 or visit www.breedtru.com and order DNA collection kits. The Micro-Card Sample Collection System requires a single drop of blood from the ear be blotted onto the card and mailed to the laboratory.

Once received, the samples are logged and results reported. Results take about two weeks for parentage verification and two or three weeks for marbling and tenderness analysis. Cost per test, depending on number sampled and test used, ranges from \$40 to \$85 per head.

MMI hopes to offer testing for traits like reproduction efficiency and fertility in the future.

