FREQUENTLY ASKED QUESTIONS

April 2014

GENEMAX® ADVANTAGE™: THE SOLUTION FOR COMMERCIAL ANGUS HEIFER SELECTION

GENEMAX ADVANTAGE

Q. What is GeneMax Advantage?

A. GeneMax Advantage is a genomic test for 75% and higher commercial Black Angus females. The test ranks heifers for net return using three economic index scores, identifies genetic outliers for four additional traits and facilitates multi-sire assignment from candidate Zoetis® HD 50K-tested sires. GeneMax Advantage delivers more dependable information for heifer selection, mating and marketing decisions.

Q. What index scores are included in GeneMax Advantage?

A. GeneMax Advantage includes three economic index scores :

- Cow Advantage: Predicts differences in profitability from heifer development, pregnancy and calving, to the sales of weaned progeny.
- Feeder Advantage: Predicts differences in net return of feeder calf progeny due to growth, feed efficiency and CAB carcass merit.
- Total Advantage: Predicts differences in profitability from genetic merit across all economically relevant traits captured in Cow and Feeder Advantage index scores.

Q. What are the GeneMax Advantage index scores based on?

A. GeneMax Advantage index scores are based on comprehensive economic assumptions (costs and revenues) and genomic breeding values for ten economically important traits that span the beef supply chain from conception to carcass. The economic assumptions are consistent with those used for dollar indexes available for registered Angus seedstock computed by Angus Genetics, Inc. Genomic predictions were derived from HD 50K for Angus.

Q. How effective are the new GeneMax Advantage index scores?

A. Approximately 30% and 45% of the additive genetic differences across contributing traits are accounted for by Cow Advantage and Feeder Advantage scores, respectively. If Angus breed composition is lower than 75%, these benchmark levels of explained variation are expected to be reduced.

Q. What is the economic advantage of selecting commercial Angus heifers based on GeneMax Advantage scores?

A. GeneMax® Advantage™ scores range from 1 to 100. Higher scores are more desirable and represent combined genetic merit for greater expected net return. A 50-unit difference in Total Advantage score equates to between $75 and $80 per female advantage in net return from the first calf crop. Corresponding per calf values for a 50-unit difference in Cow and Feeder Advantage scores are approximately $35 and $50, respectively.

Q. How often will index assumptions and trait predictions be updated?

A. The economic assumptions behind GeneMax Advantage are based on the most recent three-year rolling average for cattle sale prices and costs of production.[1–7] The intent is to update these assumptions, as well as economic weighting factors and genomic predictions, on an annual basis to maximize their predictive value and economic relevance for historic and new animals tested.

Q. What is Smart Outlier reporting?

A. GeneMax Advantage includes Smart Outlier reporting for easy identification of animals that likely posess relatively extreme genetics—low or high—for the following traits:

- Cow Cost: Identifies highest cost cows from extremes in size and milk (Bottom 5%)
- Docility: Identifies genetic potential for less desirable temperament (Bottom 5%)
- Marbling: Identifies low and high marbling (Top and Bottom 25%)
- Tenderness: Identifies unfavorable tenderness outliers (Bottom 5%)

Q. How can producers utilize Smart Outlier reporting in decision making?

A. Outlier animals flagged for genetics associated with higher costs, potentially unmanageable behavior and notably less desirable eating experiences are candidates for culling or corrective mating.

Since marbling is the key qualifier for CAB, females with both the highest and lowest quartile for marbling genetic potential are identified. High marbling animals have greater mating flexibility and marketing value, while lower marbling animals are potential candidates for corrective mating.

Q. How many markers are in the GeneMax Advantage test?

A. The exact number of markers used for GeneMax Advantage scores varies for each underlying trait and index. While the genotyping platform is proprietary to Zoetis®, customers should know that GeneMax Advantage indexes are derived from thousands of marker genotypes from each animal tested.

Q. What is Sire Match, and how do I use this information?

A. GeneMax Advantage matches tested females to registered and transferred HD 50K-tested Angus sires. Sire identification enables complementary mating decisions and management of inbreeding. Angus bull buyers are encouraged to select bulls based on GE-EPDs powered by HD 50K.

Q. How can I receive Sire Match information if the bulls I used are not HD 50K-tested?

A. Angus sires must be Zoetis HD 50K tested for sire parentage to be assigned to GeneMax-tested daughters. Commercial cow-calf producers should request that Angus bull purchases be registered and transferred to their ownership to enable seamless sire parentage assignment for GeneMax-tested progeny. Sire candidates may be HD 50K tested either before or after potential daughters are tested with GeneMax.

Q. What are the advantages of GeneMax Advantage if I am using Zoetis HD 50K-tested bulls?

A. Bull selection based on superior American Angus Association® GE-EPDs powered by Zoetis HD 50K sets the stage for producing the best calf crop possible. GeneMax Advantage enables selection of heifers for higher net returns. An especially valuable attribute of a Zoetis HD 50K–tested bull battery is that GeneMax-tested progeny are likely to have specifically assigned sires. This information can be used to make strategic marketing and mating decisions and minimize inbreeding.

Q. Can I use GeneMax Advantage in males?

A. GeneMax Advantage is only for commercial Angus females that are 75% or greater Angus breed composition.

Q. Can GeneMax Advantage be used in heifers that are less than 75% Black Angus?

A. GeneMax Advantage may be used in heifers that are slightly less than 75% Black Angus breed composition, but customers should understand that expected efficacy, or explained genetic variation, is anticipated to be compromised since animals are of lower percent Angus.

SAMPLE COLLECTION, SUBMISSION AND RESULTS

Q. What sample types are acceptable for GeneMax Advantage testing?

A. Blood cards and Allflex® tissue samples may be used for GeneMax Advantage. Blood cards are the recommended sample type for HD 50K and GeneMax Focus™, and Allfex tissue samples cannot be used for these tests.

Q. What is the turnaround time from submitting samples to receiving results?

A. Customers are advised to allow up to 30 days from the time of sample arrival at AGI to the delivery of results through the secured customer portal of the AAA/AGI website.

Q. How do I order tests and where do I send samples?

A. More information and electronic ordering of Zoetis HD 50K, GeneMax Advantage and GeneMax Focus can be found at www.angus.org/agi and all samples must be submitted to:

AGI

Angus Genetics Inc. (AGI)
3201 Frederick Ave.
Saint Joseph, MO 64506
Phone: 816-383-5100

Q. Can I send my samples directly to Zoetis?

A. AGI/CAB are the exclusive distributors of HD 50K for Angus, GeneMax® Focus™ and GeneMax Advantage™, and all samples for these tests should always be sent directly to AGI.

GENOMIC TESTING OVERVIEW

Q. What other genomic tests are provided by the partnership of Angus Genetics Inc. (AGI), Certified Angus Beef® (CAB) and Zoetis®?

A. These tests deliver Angus breeders and commercial producers a comprehensive and powerful genetic game plan to advance productivity and net returns.

- **HD 50K for Angus Seedstock Producers:** Genomic Enhanced Expected Progeny Differences (GE-EPDs) powered by Zoetis HD 50K deliver the equivalent of an initial progeny proof to the accuracy of EPDs for 15 traits. This is especially valuable for both commercial bull buyers and seedstock sellers of young Angus sire prospects, as well as for selection and mating of Angus females. The USDA SNP parentage markers included on HD 50K are used to verifying parentage and inform sire parentage assignment for GeneMax-tested progeny produced from multi-sire breeding schemes.
- **GeneMax Focus** provides genomic predictions for feedlot gain and marbling, as well as sire match.

Q. When should I use GeneMax Advantage and when should I use GeneMax Focus?

A. GeneMax Focus is recommended if only information about postweaning growth, grade (marbling) and sire match information are needed to inform feeder/fed cattle marketing and/or replacement heifer decisions.

GeneMax Advantage provides more complete genetic information across the broad range of economically important maternal, efficiency, growth and carcass traits that span the beef production chain. This test was developed specifically for replacement heifer decisions.

Q. Can GeneMax be used by seedstock producers on registered Angus animals?

A. GeneMax Advantage and GeneMax Focus are only intended for use on unregistered, commercial Angus animals. As such, GeneMax predictions do not contribute to GE-EPDs. Zoetis HD 50K for Angus and resulting GE-EPDs, accuracy and index values, are for registered Angus breeders.

References

1 American Angus Association/Angus Genetics Inc. 3201 Frederick Ave. St. Joseph, MO 64506.

2 Beal WE. 1998. More Milk – What's It Cost? *Angus Journal.* November 1998.

3 Beal WE. 1998. Will More Milk Mean Cows won't Rebreed? *Angus Journal.* December 1998.

4 CattleFax. 8110 East Nichols Avenue, Suite #301, Englewood, CO 80112.

5 Fox DG, Sniffen CJ, O'Connor JD. Adjusting Nutrient Requirements of Beef Cattle for Animal and Environmental Variations. *J Anim Sci* 1998;66:1475.

6 McCorkle D, Bevers S. Cow-Calf Enterprise Standardized Performance Analysis. 2009. Available at: http://hdl. handle.net/1969.1/86917. Accessed March 19, 2014.

7 NRC. 2000. Nutrient Requirements of Beef Cattle (7th Revised Edition: Update 2000). National Academy Press, Washington, D.C.

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