

Policy Established for DD Genetic Condition

Technology ushers in new approach for handling latest genetic condition.

by American Angus Association

The American Angus Association announced Aug. 12 that a genetic condition has been identified and documented in Angus cattle through research initiated in Australia with Jonathan Beever at the University of Illinois. This condition, inherited as a simple recessive, has been designated as Developmental Duplication (DD).

The Board of Directors convened by phone Aug. 12 to consider the implications of this genetic condition. At the conclusion of that meeting, President Phil Trowbridge appointed a Task Force and directed it to report to the full Board as soon as practical how the Association should respond to this condition considering the best interests of the breed and the membership, the evolving scientific advances in the field of genetics, members' ability to manage such conditions, and the likelihood that the scientific community will continue to identify genetic conditions in all breeds with increasing frequency in the future.

Trowbridge announced and explained the policy established with regard to DD in a letter to Angus breeders posted on the Association's classic website (www.angus.org/angus.aspx) Aug. 14.

Letter from American Angus Association President Phil Trowbridge

Dear Angus Breeders,

Today, the Board of Directors voted unanimously to recognize Developmental Duplication (DD) as a genetic condition, inherited as a simple recessive. The Board also unanimously adopted a policy relating to the registration status of current and future animals determined to carry this mutation. This newly adopted policy does not require or mandate the testing of potential carriers as a precondition of continued or prospective registration. Rather, the policy assumes that members will follow sound breeding decisions and make strategic use of DNA testing in dealing with this genetic condition. Because this policy represents an evolution in the Association's approach to genetic conditions generally and, in some respects, a departure from those policies first formulated in the fall of 2008 and the winter of 2009, the Board asked

that I share some of its thinking with you on the subject.

With the onset of DD, it became clear that the discovery of genetic conditions will be a part of the future for all breeds of cattle. This Association's early "DNA era" began in 2008 with the development of policies related to first AM and then NH. Those policies were based on the perception that each represented catastrophic, once-in-a-lifetime events. Both conditions were lethal. These early policies were premised on the good-faith belief that the best way to eliminate the condition and, at the same time, protect the interests of our commercial customers, was to impose some form of testing as a precondition for registration. This mandatory-testing approach has undoubtedly resulted in a measurable decrease in the frequency of AM, NH and CA, but has come with a significant price tag for the membership.

As the article authored by Jonathan Beever, Ph.D. of the University of Illinois, that was posted on our website on August 12, 2013, makes clear, the discovery of DD appears to present another condition similar in scope to AM, NH and CA. Leading geneticists in the bovine academic community have increasingly observed that all breeds have hundreds of mutations in their genome and that an Association's approach to genetic conditions should be adapted to reflect the likelihood — indeed, the certainty — that the discovery of such conditions will continue in the future and at a pace accelerated by new scientific tools available at every turn. (See "Bad News: They're All Carriers of Something: Understanding the Impact of Broken Genes in the Beef Business by Dorian Garrick, Iowa State University on page 250 of this issue.)

There are alternatives to mandatory testing and, over the past five years, our members have shown a willingness to embrace them. These include a better understanding and acceptance of the ability to manage around a known genetic condition by avoidance of breeding carrier to carrier and by the use of voluntary, strategic DNA testing. Equally important, our commercial breeders also understand and embrace these management principals.

The Board has considered this condition, the best interests of the breed and the membership, the state of where the science of genetics is

moving with respect to the early detection of genetic conditions, and our members' and their customers' ability to manage such conditions. Based on its review of these factors, undertaken over an abbreviated period given the timing of the issue, the Board has adopted the attached policy (see "Angus policy for Developmental Duplication (DD).")

The Board thanks you for your patience.

Best regards,



Phil Trowbridge
President

Preliminary results of AI sires posted

Artificial insemination (AI) organizations requested the Association provide to the membership the identity of and preliminary test results for 1,099 Angus bulls tested by Beever to determine whether they were carriers or free of the mutation identified for this genetic condition. The Association Board of Directors' decision to provide that information to the membership is based in part on its understanding that the test used here was run on a set of animals requested by Beever from the AI organizations for research purposes and therefore remains preliminary in nature. (For an update on the research by Beever, the list of the animals and their preliminary test results, please visit www.angus.org/Pub/DD/DD_Update08122013.pdf.)

Commercial testing available

In late August, Angus Genetics Inc. (AGI) announced that it is accepting orders and samples to test for DD status (carrier or free) through Zoetis Genetics or GeneSeek. As with other tests, orders are to be submitted through the AGI ordering process available at the Association's AAA Login website (www.angusonline.org). Either Association archived or newly collected samples may be used for testing.

"Producers can use the current technology

to manage the incidence of these genetic conditions by avoiding the mating of carrier animals,” says Sally Northcutt, Association director of genetic research, encouraging cattlemen to use the DNA tests available as a strategic tool to enable sound

breeding decisions (see “Managing Genetic Conditions,” page 184).

Complete information about this condition is available at www.angus.org/Pub/DD/DDInfo.aspx.

Editor’s Note: At press time, the American Angus Association Board of Directors was scheduled to meet in Saint Joseph, Mo., Sept. 10-12, for its regularly scheduled quarterly meeting. For the latest information, visit www.angus.org/angus.aspx.



Angus policy for Developmental Duplication (DD)

(As adopted Aug. 14, 2013)

Preface

Pursuant to Rule 307 of the Rules of the American Angus Association (herein after “the Association”), the Board of Directors hereby adopts the following policy regarding the following genetic condition:

Developmental Duplication (Polymelia) genetic mutation (hereinafter “DD”). The Developmental Duplication mutation was recognized as a genetic condition on August 14, 2013.

The Impacted Genetics

For the purposes of the procedures that follow, the phrase “the impacted genetics,” as it references the DD mutation, currently refers to all confirmed carrier animals or animals with confirmed carriers of the DD mutation in their pedigrees. These currently identified references do not preclude other ancestors from potentially being identified as carriers at a later time.

Procedures

The following procedures shall be followed in connection with the registration status of potential and known carriers of DD:

I. Status of Currently Registered Females and Bulls

Notwithstanding any subsequent test results, all registered females and bulls with the impacted genetics in their pedigrees as of August 14, 2013, shall remain registered.

II. Resulting Progeny of Carrier Females and Bulls

All resulting progeny of currently registered carrier females or carrier bulls may be registered without submitting to testing. Notwithstanding such registration, the Association shall place or electronically display a notation, as described in Section VII.A. of this Policy, on each Performance Registration Certificate, Angus Performance Pedigree or any other pedigree displayed electronically.

III. Currently Registered Animals Determined to be Affected by the Mutation

Any animals identified as being homozygous for the mutation, shall therefore be considered to be affected by the condition, and are not eligible for registration under Rule 103d. In the event that a registered animal is discovered to be affected by the condition, its registration shall be considered null and void, and the Certificate of Registration must be returned to the Association for cancellation.

IV. Testing of Animals

A. Testing to determine whether an animal is a carrier of the mutation, is free of the mutation, or affected by it shall be conducted at those laboratories approved by the Association.

B. The results of such testing shall be provided to the Association and the submitting member as soon as practicable after the test results are available.

V. Publication of Test Results by the Association

Upon receipt of a test result from an approved laboratory that determines whether an animal is a carrier of the mutation, free of the mutation, or affected by it, the Association shall list the name, registration number and test result of each such animal on its website. The Association shall also maintain an updated list of each animal determined to be a carrier or determined to be affected, as

well as those who have tested free of such defect. Upon request, the Director of Member Services shall provide such a list at no cost to the requesting member.

VI. Right to Request a Second DNA Test

In those instances in which an animal previously registered or seeking registration is tested and determined to be a carrier of the mutation (and is identified as such on the Association’s website), the member owner of record may request that an approved laboratory conduct a second DNA test on a sample from such animal. In order to process a request for a second test, the member owner of record must provide materials or samples sufficient to permit the laboratory to verify the parentage of the animal in question.

VII. Notations on Registration and Performance Pedigree Certificates

A. Seven months following the availability of a commercial test for the mutation at laboratories approved by the Association, the Association shall place or electronically display the following notation on the registration and performance pedigree certificates of all registered animals that descend from an animal determined to be a carrier of the mutation, unless an intervening DDF status eliminates all genetic ties to a known carrier ancestor.

This animal has one or more ancestors known to carry a mutation that can result in calves with a genetic condition known as Developmental Duplication (DD). Avoidance of mating carrier animals is an essential component of managing the incidence of genetic conditions, as is the strategic use of DNA testing.

Such notification will remain in place until the Association receives an official determination from an approved laboratory that the particular animal tested as a carrier of the mutation or free of it, in which case its certificates will be denoted pursuant to Sections VII.B and C of these procedures.

B. Upon receipt of a test result from an approved laboratory, the Association shall place or electronically display the letter designation(s) “DDF” on the registration and performance pedigree certificates of any animal that has been determined by such a test to be free of the mutation. DDF shall mean “Developmental Duplication — Free,” or that an animal is free of the mutation.

C. Upon receipt of a test result from an approved laboratory, the Association shall place or electronically display the letter designation(s) “DDC” on the registration and performance pedigree certificates of any animal that has been determined by such test to be a carrier of the mutation. DDC shall mean “Developmental Duplication — Carrier,” or that the animal is a carrier of the mutation.

D. Upon receipt of a test result from an approved laboratory, the Association shall place or electronically display the letter designation(s) “DDA” on any animal that has been determined by such test to be an affected animal. The “DDA” letter designation shall be reflected on any registration and performance pedigree certificates where the affected animal appears as an ancestor. DDA shall mean “Developmental Duplication — Affected,” or that the animal is affected by the mutation.

NOTE: These procedures apply only to the Developmental Duplication mutation.