Part 3: Policy Regarding Specific Genetic Conditions and Genetic Factors

Rules 300 to 307 set forth the Genetic Conditions Policy of the American Angus Association and those rules relating to it. Rule 350GF relates to Genetic Factors. Please refer to this policy and set of rules for more information as well as for definitions of genetic conditions recognized by the Association.

The abnormalities listed there are considered pathological (disease) conditions of genetic origin. These "genetic conditions" include an impairment of health or a condition of abnormal function due to an abnormal or mutated gene. In instances in which a reliable DNA test has been developed and approved by the Association that conclusively identifies and separates carriers of a recognized genetic condition from those free of the same condition, Rule 307 delegates to the Board the discretion to develop, establish and implement a policy tailored to address the circumstances of a particular situation.

Set forth below is the American Angus Association's policy relating to arthrogryposis multiplex (AM), neuropathic hydrocephalus (NH), contractural arachnodactyly (CA), myostatin nt821 gene deletion (M1), PRKG2 gene mutation for dwarfism (D2), developmental duplication (DD), oculocutaneous hypopigmentation (OH) and osteopetrosis (OS).

Members with questions regarding the following policy or the Genetic Conditions Policy or Related Rules in general should contact Member Services for clarification.

Policy of the American Angus Association relating to the Registration Status of Potential and Known Carriers of Arthrogryposis Multiplex (AM), Neuropathic Hydrocephalus (NH), Contractual Arachnodactyly (CA) and Osteopetrosis (OS).

(As combined and amended on September 13, 2012, September 13, 2013 and September 13, 2017)

Preface

Pursuant to Rule 307 of the Rules of the American Angus Association (hereinafter "the Association"), the Board of Directors hereby adopts the following policy regarding the following separate genetic conditions:

Arthrogryposis Multiplex (AM)
Neuropathic Hydrocephalus (NH)
Contractural Arachnodactyly (CA)
Osteopetrosis (OS)

Definitions and Referenced Dates Used in this Policy

The phrase "impacted genetics" shall refer to any animal that is a descendant of a confirmed carrier of the AM, NH, CA or OS mutation that does not have an intervening descendant that has tested free of such mutation(s) at a laboratory approved by the Association. These currently identified references do not preclude other ancestors from potentially being identified as carriers at a later time.

Dates on which the Association Recognized the Conditions:

November 15, 2008 (AM)
June 12, 2009 (NH)
July 14, 2010 (CA)
April 15, 2016 (OS)

Dates on which the Association began to provide Commercialized Tests at Approved Laboratories:

January 1, 2009 (AM)
June 15, 2009 (NH)
October 4, 2010 (CA)
May 17, 2016 (OS)

Procedures and Qualifications for Registration

I. Status of Females and Bulls with Impacted Genetics Registered with the Association *Prior* to Those Dates on which Laboratories Approved by the Association began to Provide Commercial DNA Tests to the Membership

A. All such females and bulls with the impacted genetics in their pedigrees shall remain registered. Such registrations shall not be revoked, canceled or suspended.

B. All such females and bulls with the impacted genetics in their pedigrees that are subsequently tested shall remain registered regardless of whether they are determined to be carriers or free of AM, NH, CA or OS mutations.

II. Registration of Females and Bulls with Impacted Genetics

A. Females

1. In order for any potential female carrier of AM, NH or CA to be eligible for registration on or after September 13, 2012, and in order for any potential female carrier of OS to be eligible for registration on or after May 17, 2016, such animal must be tested for the mutation in issue at a laboratory approved by the Association. Following such test, the animal shall be eligible for registration regardless of whether it is determined to be a carrier or free of the mutation in issue. The test results shall be prominently denoted on such animal's registration and performance certificates in the manner prescribed below.

B. Bulls

1. In order for any potential bull carriers of AM, NH or CA to be eligible for registration on or after September 13, 2012, and in order for any potential bull carrier of OS to be eligible for registration on or after May 17, 2016, such animal must be tested for the mutation in issue at a laboratory approved by the Association and found to be "free" of such mutation.

C. Steer Calves

1. All resulting steer calves of potential carrier females or potential carrier bulls may be registered without submitting to testing.

III. Registered Animals Determined to Exhibit the Genetic Condition

Any registered animal identified as being homozygous for the mutation shall be considered to exhibit the genetic condition and shall be ineligible for registration under Rule 103d of the Rules of the Association. The registration of such animal shall be considered null and void and its Certificate of Registration should be returned to the Association by the member.

IV. Registered A.I. Sires Determined to be Carriers of the Mutation

A. All calves sired artificially by non-owned bulls (calves that would require an AI service certificate) shall be ineligible for registration if conceived after sixty (60) days following the date on which that sire is listed on the Association's website as a carrier of the mutation. Calves resulting from embryos conceived artificially by non-owned bulls with embryo removal dates after 67 days following the date on which that sire is listed on the Association's website as a carrier of the mutation shall be ineligible for registration.

B. The Association will publish the names and registration numbers of such sires on its website only upon receipt of a test determination from an approved laboratory.

V. Registration of Clones with Impacted Genetics

Clones of any animal determined to be a carrier of the mutation shall be ineligible for registration. Clones of untested animals with the impacted genetics shall also be ineligible for registration.

VI. Testing of Animals

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

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

VIII. 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.

IX. Notations on Registration and Performance Pedigree Certificates

A. Upon receipt of a test result from an approved laboratory, the Association shall place or electronically display the letter designation(s) "AMF," "NHF", "CAF" or "OSF" on the registration and performance pedigree certificates of any animal that has been determined by such a test to be free of the mutation. **AMF** shall mean "**Arthrogryposis Multiplex – Free**" or that an animal is free of the mutation. **NHF** shall mean "**Neuropathic Hydrocephalus – Free**" or that an animal is free of the mutation. **CAF** shall mean **"Contractural Arachnodactyly – Free"** or that an animal is free of the mutation. **OSF** shall mean **"Osteopetrosis – Free"** or that an animal is free of the mutation.

B. Upon receipt of a test result from an approved laboratory, the Association shall place or electronically display the letter designation(s) "AMC," "NHC", "CAC" or "OSC" on the registration and performance pedigree certificates of any animal that has been determined by such test to be a carrier of the mutation. **AMC** shall mean "**Arthrogryposis Multiplex – Carrier**" or that the animal is a carrier of the mutation. **NHC** shall mean "**Neuropathic Hydrocephalus – Carrier**" or that the animal is a carrier of the mutation. **CAC** shall mean **"Contractual Arachnodactyly – Carrier**" or that the animal is a carrier of the mutation. **OSC** shall mean **"Osteopetrosis – Carrier"** or that an animal is a carrier of the mutation.

C. Upon receipt of a test result on an affected animal from an approved laboratory, the Association shall place or electronically display the letter designation "CAA" on any registration and performance pedigree certificates on which the affected animal appears as an ancestor. **CAA** shall mean **"Contractural Arachnodactyly – Affected."**

D. The Association shall place or electronically display the letter designation(s) "AMP," NHP," "CAP" or "OSP" 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 AMF, NHF, CAF or OSF status eliminates all genetic ties to a known carrier ancestor (registered prior to September 13, 2012 for AM, NH and CA). **AMP** shall mean **"Arthrogryposis Multiplex –Potential"** or that the animal is potentially a carrier of the mutation. **NHP** shall mean **"Neuropathic Hydrocephalus – Potential"** or that the animal is potentially a carrier of the mutation. **CAP** shall mean **"Contractual Arachnodactyly – Potential"** or that the animal is potentially a carrier of the mutation. **OSP** shall mean **"Osteopetrosis – Potential"** or that an animal is potentially a carrier of the mutation.

Such notification will remain in place until the Association either receives an official determination from an approved laboratory that the particular animal has been tested and found to be free of or a carrier of the mutation or an intervening ancestor of the animal has tested free of such mutation. In such instances, the certificate on the animal will be denoted in accordance with Section IX.A and B of this policy.

NOTE: These procedures apply only to Arthrogryposis Multiplex, Neuropathic Hydrocephalus, Contractural Arachnodactyly and Osteopetrosis.

Policy of the American Angus Association Relating to the Registration Status of Potential and Known Carriers of Myostatin nt821 Gene Deletion (M1), Developmental Duplication (DD) and Oculocutaneous Hypopigmentation (OH).

(As combined and amended on September 13, 2017)

Preface

Pursuant to Rule 307 of the Rules of the American Angus Association (hereinafter "the Association"), the Board of Directors hereby adopts the following policy regarding the following separate genetic conditions: Double muscling (Skeletal Muscle Hypertrophy), Myostatin nt821 gene deletion (M1), Developmental Duplication (DD) and Oculocutaneous Hypopigmentation (OH).

Definitions and Referenced Dates Used in this Policy

The phrase "impacted genetics" shall refer to any animal that is a descendant of a confirmed carrier of the M1, DD or OH mutation that does not have an intervening descendant that has tested free of such mutation(s) at a laboratory approved by the Association. These currently identified references do not preclude other ancestors from potentially being identified as carriers at a later time.

Dates on which the Association Recognized the Conditions:

June 20, 2011 (M1)
August 14, 2013 (DD)
November 2, 2015 (OH)

Dates on which the Association began to provide Commercialized Tests at Approved Laboratories:

July 1, 2011 (M1)
August 27, 2013 (DD)
December 16, 2015 (OH)

Procedures

The following procedures shall be followed in connection with the registration status of potential and known carriers of M1, DD and OH:

I. Status of Currently Registered Females and Bulls

A. As used herein, the word "currently" in the phrase "currently registered" shall mean that date on which laboratories approved by the Association began to provide a commercial DNA test for the mutation to the membership.

B. All currently registered females and bulls with the impacted genetics in their pedigrees shall remain registered. In other words, their registrations will not be revoked, canceled or suspended.

C. All currently registered females and bulls with the impacted genetics in their pedigrees that are tested and determined to be carriers of the mutation 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 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
For the mutation M1 and OH, 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 cancelation. For the mutation DD, any animals identified as being homozygous for the mutation, shall therefore be considered to be affected by the condition. Such animals shall be eligible for continued and prospective registration.

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 condition. 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. Upon receipt of a test result from an approved laboratory, the Association shall place or electronically display the letter designation(s) "M1F", "DDF" or "OHF" on the registration and performance pedigree certificates of any animal that has been determined by such a test to be free of the mutation. **M1F** shall **mean "Myostatin nt821 mutation for Double Muscling – Free"** or that an animal is free of the mutation. **DDF** shall mean **"Developmental Duplication – Free"** or that an animal is free of the mutation. **OHF** shall mean **"Oculocutaneous Hypopigmentation – Free"** or that an animal is free of the mutation.

B. Upon receipt of a test result from an approved laboratory, the Association shall place or electronically display the letter designation(s) "M1C", "DDC" or "OHC" on the registration and performance pedigree certificates of any animal that has been determined by such test to be a carrier of the mutation. **M1C** shall mean **"Myostatin nt821 mutation for Double Muscling – Carrier"** or that the animal is a carrier of the mutation. **DDC** shall mean **"Developmental Duplication – Carrier"** or that the animal is a carrier of the mutation. **OHC** shall mean **"Oculocutaneous Hypopigmentation – Carrier"** or that the animal is a carrier 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) "M1A", "DDA" or "OHA" on any animal that has been determined by such test to be an affected animal. **M1A** shall mean **"Myostatin nt.821 mutation for Double Muscling – Affected"** or that the animal is affected by the mutation. **DDA** shall mean **"Developmental Duplication – Affected"** or that the animal is affected by the mutation. **OHA** shall mean **"Oculocutaneous Hypopigmentation – Affected"** or that the animal is affected by the mutation.

D. The Association shall place or electronically display the letter designation(s) "M1P", "DDP" or "OHP" 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 M1F, DDF or OHF status eliminates all genetic ties to a known carrier ancestor. **M1P** shall mean **"Myostatin nt821 mutation for Double Muscling – Potential"** or that the animal is potentially a carrier of the mutation. **DDP** shall mean **"Developmental Duplication – Potential"** or that the animal is potentially a carrier of the mutation. **OHP** shall mean **"Oculocutaneous Hypopigmentation – Potential"** or that the animal is potentially a carrier of the mutation.

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.A and B of these procedures.

NOTE: These procedures apply only to Myostatin nt821 Gene Deletion (M1), Developmental Duplication (DD) and Oculocutaneous Hypopigmentation (OH).

Policy of the American Angus Association Relating to the Registration Status of Potential and Known Carriers of PRKG2 Gene Mutation for Dwarfism ("D2")

(As adopted August 29, 2011 and amended effective September 19, 2011)

Preface

Pursuant to Rule 307 of the Rules of the American Angus Association (hereinafter "the Association"), the Board of Directors hereby adopts the following policy regarding the following genetic condition: PRKG2 gene mutation for dwarfism (hereinafter "D2").

D2 was recognized as a genetic condition on September 7, 2007.

The Impacted Genetics

For the purposes of the procedures that follow, the phrase "the impacted genetics", as it references the D2 mutation, currently refers to all animals with confirmed carriers of the D2 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 D2:

I. Status of Currently Registered Females and Bulls

A. As used herein, the word "currently" in the phrase "currently registered" shall mean that date on which the Board adopted its policy related to D2. Such date(s) will be published on the Association's website.

Note: With respect to D2, that date was August 29, 2011.

B. All currently registered females and bulls with the impacted genetics in their pedigrees shall remain registered. In other words, their registrations will not be revoked, canceled or suspended.

C. All currently registered females and bulls with the impacted genetics in their pedigrees that are tested and determined to be carriers of the mutation shall remain registered.

II. Resulting Progeny of Carrier Females and Bulls

A. Heifer Calves

All resulting heifer calves of currently registered carrier females or carrier bulls must be DNA tested for the mutation recognized under this policy at a laboratory authorized by the Association in order to be eligible for registration. The results of such test (reflecting whether the heifer calf so tested is a carrier of the mutation or free of it) shall be denoted on that animal's registration and performance certificates in the manner prescribed below.

B. Bull Calves

All resulting bull calves of registered carrier females or carrier bulls must be DNA tested for the mutation recognized under this policy at a laboratory authorized by the Association and found to be free of that mutation in order to be eligible for registration.

C. Steer Calves

All resulting steer calves of currently registered carrier females or carrier bulls may be registered without submitting to testing.

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 cancelation.

IV. Currently Registered A.I. Sires Determined to be Carriers of the Mutation
A. All calves sired artificially by non-owned bulls (calves that would require an AI service certificate) shall be ineligible for registration if conceived after sixty (60) days following the date on which that sire is listed on the Association's website as a carrier of the mutation. Calves resulting from embryos conceived artificially by non-owned bulls with embryo removal dates after 67 days following the date on which that sire is listed on the Association's website as a carrier of the mutation shall be ineligible for registration.

B. The Association will publish the names and registration numbers of such sires on its website only upon receipt of a test determination from an approved laboratory.

V. Registration of Clones with Impacted Genetics
Clones of any animal determined to be a carrier of the mutation shall be ineligible for registration. Clones of untested animals with the impacted genetics shall also be ineligible for registration.

VI. 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.

VII. 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 condition. Upon request, the Director of Member Services shall provide such a list at no cost to the requesting member.

VIII. 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.

IX. Notations on Registration and Performance Pedigree Certificates
A. Upon receipt of a test result from an approved laboratory, the Association shall place or electronically display the letter designation(s) "D2F" on the registration and performance pedigree certificates of any animal that has been determined by such a test to be free of the mutation. D2F shall mean "PRKG2 Dwarfism – Free", or that an animal is free of the mutation.

B. Upon receipt of a test result from an approved laboratory, the Association shall place or electronically display the letter designation(s) "D2C" on the registration and performance pedigree certificates of any animal that has been determined by such test to be a carrier of the mutation. D2C shall mean "PRKG2 Dwarfism – Carrier", or that the animal is a carrier 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) "D2A" on any animal that has been determined by such test to an affected animal. The "D2A" letter designation shall be reflected on any registration and performance pedigree certificates where the affected animal appears as an ancestor. D2A shall mean "PRKG2 Dwarfism – Affected", or that the animal is affected by the mutation.

D. The Association shall place or electronically display the letter designation(s) "D2P" 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 D2F status eliminates all genetic ties to a known carrier ancestor. D2P shall mean "PRKG2 Dwarfism – Potential", or that the animal is potentially a carrier of the mutation.

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 IX.A and B of these procedures.

NOTE: These procedures apply only to PRKG2 gene mutation for dwarfism.