

Genetic Defects: Policy and Related Rules

Abnormalities and Genetic Defects

Abnormalities are present in all species, including virtually all breeds of cattle. Some abnormalities can be identified visually because of the obvious differences between a normal animal and an abnormal one. Abnormalities in cattle may be caused by a variety of factors, including the environment, infectious agents and genetic mutations. Environmental factors, such as toxic plants, can cause an abnormal calf. Likewise, infectious agents (such as bacteria, viruses and fungi) may result in an abnormal calf. This policy and the rules that follow relate to those abnormalities that are pathological (disease) conditions of genetic origin. These types of abnormalities have come to be known as “genetic defects.” Genetic defects include an impairment of health or a condition of abnormal function, due to an abnormal or mutated gene. Before designating a condition a genetic defect, it is important to give consideration to environmental and infectious causes.

The Association currently recognizes the following genetic defects, each of which includes a brief description of the condition. These defects may result in either increased mortality, increased morbidity, decreased production, and/or decreased ability to market cattle. As such, their unchecked presence in the population is undesirable.

a. Dwarfism (snorter, bulldog, long headed)

There are several different types of dwarfism, but all dwarfs appear shorter and some smaller than normal. The legs and body are short, and the animal may appear to have a potbelly and a thick or blocky shape. The head may be normal (long-nosed or long headed dwarf) or the face may appear shortened. Muscling is often normal and thus calves may have a thick appearance.

b. Osteopetrosis (marble bone disease)

Calves are born dead, usually 10 to 30 days premature. The body can be small and a shortened (undershot) lower jaw (brachygnathia inferior) with impacted molars may be present. Bones are solid and do not have a normal bone marrow cavity. The bones are brittle. Diligence in examination of all late term aborted purebred Angus fetuses, particularly those with short lower jaws and those from lines that may contain the gene, is necessary as external signs can be overlooked.

c. Double muscling

Animals are extremely heavily muscled in appearance, including abnormally large, wide and rounded rump and thighs with prominent creases between muscle groups. There is usually little covering fat and bones are thin.

d. Syndactyly (mule foot)

The two toes are fused together to make one toe resembling the foot of a mule or horse. Front feet are most often affected, but the condition can involve any or all feet.

e. Arthrogryposis Multiplex (curly calf)

Calves are born dead or die shortly after birth. The spine and legs appear crooked or twisted and the joints of the legs are often fixed in positions. Front legs are contracted and rear limbs may be contracted or extended. Calves are small and appear thin due to limited muscle development. There may be a cleft affecting the nose or palate.

f. Heterochromia Irides (white eye)

Cattle usually have a dark black iris because of dark pigment in the eye. White eye is a condition where the pigment of the eye is absent, giving the eye a white or silver appearance.

This policy and the rules that follow address these genetic defects. In administering Rules 300 to 307, it is recognized that the Board may, and it is entitled to, rely upon the opinion and expertise of scientists, in cooperation with professional staff members, who have training in such matters.

Policy Overview

It shall be the policy of the Association to provide its member owners with as accurate information as possible relating to the status of known, recognized or scientifically suspected genetic defects. Subject to accepted and commercially feasible scientific procedures and technologies and depending on the severity of the defect in issue, the Association shall attempt to eliminate or reduce, to the extent feasible, the introduction or continuation of such genetic defects in the Angus breed.

On matters relating to issues involving the identification and detection of genetic defects generally, as well as the relative risks or lack of risks associated with such defects, the Board of Directors and the professional staff may, as needed, seek the advice of scientists versed in such matters. The ultimate decision as to any such matter will be determined by the Board of Directors.

As previously noted, the Association currently recognizes certain genetic defects that have historically affected some Angus cattle. In the case of many of these recognized defects, no DNA tests have yet been developed that allow the Association and its member owners to scientifically conclude that any particular animal is a carrier of a genetic defect – other than where an affected calf has been parent verified to a particular sire and dam. In such instances, Rules 300 through 306 focus primarily on the status of the parent carriers as well as the status of currently registered and future progeny of such carriers. Ancestors of such known carriers are currently unable to be scientifically implicated or dealt with.

In those other 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 defect from those free of the same defect, Rule 307 delegates to the Board the duty and the discretion to develop, establish and implement a policy tailored to address the circumstances of a particular situation. DNA testing provides the Association and its member owners with a greater level of scientific certainty by which they may classify and deal with registered animals and

future progeny impacted by such genetics. This includes ancestors. This rule shall also apply to those situations in which scientific knowledge suggests that the Association should depart from the approach historically taken in Rules 300 through 306.

Rules 300 through 306 below represent the historical approach that the Association has followed and will continue to follow in the absence of a DNA test that can determine the carrier status of an animal.

Rule 300: Notification to the Association

Any member owner who becomes aware of an unusual physical abnormality, either in an animal registered with the Association or in an offspring of an animal registered with the Association, is required to notify the Director of Member Services by e-mail or phone as soon as possible. Working with the Director of Member Services, the member owner may be required to take specific steps to best position the Association and the member owner to preserve as much information on the situation as possible to aid in the scientific determination process described in Rules 300 through 306.

If a member owner or a veterinarian employed by such member owner has questions or concerns as to whether or not an abnormality is serious enough to warrant such contact, they should contact the Director of Member Services to discuss and resolve the matter. Disclosure is always the best policy. This is particularly the case in which an abnormality appears on multiple occasions and the member owner or a consulting veterinarian is unable to identify a non-genetic cause of the abnormality.

Rule 301: Information for the Association

Following receipt of a member owner's notification, the Director of Member Services may request that the member owner (or other unrelated member owners with relevant information) provide the Association with specific materials or information, including but not limited to, photos of particular animals, tissue, DNA samples, or, if possible, the affected animal itself. Information so requested shall be promptly provided to the Association. The reasonable costs for complying with such requests will be borne by the Association.

Rule 302: Determination Process

Upon receipt of such information (which the Director of Member Services may request in writing), the Association will normally direct that the reported information and other relevant materials be transmitted to a scientist (e.g., a veterinary pathologist) approved by the Association. Following an examination, the designated scientist shall notify the Association and the submitting member owner whether there is, in such individual's professional opinion, a basis to conclude that the abnormality is a recognized genetic defect within the meaning of these rules. Such an opinion shall be referred to in these Rules 300 through 306 as a "determination."

In reaching such a determination, the Association shall verify that the affected animal has been parent verified.

Rule 303: Notice to the Member Owner

In the event that the abnormality is determined to be a genetic defect within the meaning of the Association's policy, the Association will confirm notification of that determination to all member owners of record of the parents as soon as practicable.

Rule 304: Member Owner's Right to Contest the Determination

A member owner so notified in accordance with Rule 303 shall have fourteen (14) days following the giving of such notice to notify the Association in writing of an intent to contest the determination. Such written notice, which may be voluntarily waived, must be directed to the Chief Executive Officer of the Association by email or overnight mail service and include a preliminary statement of the member owner's basis for contesting the determination. Failure to provide notice within this fourteen-day notification period, or voluntary waiver, will result in the determination becoming final and the registered animals shall be subject to the publication requirements set forth in Rule 305.

Upon receipt of a timely written notice to contest the determination, the Executive Committee of the Board shall schedule a hearing to be held before it as soon as practicable. Such hearing shall proceed pursuant to those procedures established in Article VIII, Sections 8.4.(d), (e), (f) and (g) of the Bylaws, and shall include a right to appeal the finding of the Executive Committee to the Board of Directors.

Rule 305: Publication of Carriers of Genetic Defects to the Membership

Upon a final determination that an animal is a carrier of a genetic defect, the Association will promptly publish the name and registration number of the animal on the Association's website (www.angus.org). A notation to be placed on the animal's registration and performance certificates shall plainly state that the animal has been determined to be a carrier of a specific genetic defect. That animal's status as a carrier will also be displayed on all registration and performance pedigrees in which such animal appears as an ancestor. The Association shall also maintain an updated list of each animal determined to be a carrier of a specific genetic defect as well as those who have tested free of being such a carrier. Upon request, the Director of Member Services will provide such a list at no cost to the requesting member owner.

Rule 306: Registration Status of Animals Determined to be Carriers of a Genetic Defect and Current and Future Progeny of such Animals

a. Registration Status of Carrier Animals

Any animal determined to be a carrier of a genetic defect for which no DNA test has been developed and approved by the Association shall remain registered in the American Angus Herd Book but its carrier status will be denoted as such on its registration and performance pedigree certificates.

b. Registration Status of Previously Registered Progeny of Carrier Parents

Previously registered progeny of animals determined to be carriers of a genetic defect for which no DNA test has been developed and approved by the Association, shall remain registered.

c. Registration Status of Future Progeny of Carrier Parents

Future progeny of registered animals determined to be carriers of a genetic defect for which no DNA test has been developed and approved by the Association shall be ineligible for registration unless such animals are first tested in accordance with an Association-approved test that can be monitored by the Association. In the event that such progeny are tested free of the genetic defect, they will be eligible for registration and their resulting registration and performance pedigree certificates will record that such animal tested free of a particular genetic defect.

Rule 307 applies to those situations in which there is a reliable DNA test approved by the Association that conclusively identifies and separates carriers of a recognized genetic defect from animals free of such defect. It may also apply in those situations in which there is scientific knowledge to suggest that the Association should depart from the historical approach contained in Rules 300 through 306.

Rule 307: Board of Director's Discretion to Address Specific Circumstances

In those instances in which there is a reliable test (capable of being conducted by laboratories approved by the Association) that the Association believes will conclusively identify and separate carriers of a recognized genetic defect from animals free of such defect, the Board shall have the discretion to develop, establish and implement a specific policy to address a particular set of circumstances.

In those circumstances in which there is scientific knowledge to suggest that the Association should depart from the historical approach contained in Rules 300 through 306, the Board shall also have the discretion to develop, establish and implement a specific policy to address a particular set of circumstances.

In doing either, the Board shall take into account the purpose of the Association's policy as well as any additional factors it determines are of importance in a given situation. Such policy may differ or depart from the directives contained in Rules 300 through 306 as the Board, in its discretion, determines is necessary or appropriate under the circumstances.