American Chianina Association (ACA)

Genetic Abnormality Testing Policy

1. Designation of Abnormalities with Monitor Status

It shall be the policy of the ACA to provide its member owners with as accurate information as possible regarding the status of known, recognized or scientifically suspected genetic abnormality. Subject to accepted and commercially feasible scientific procedures and technologies and depending on the severity of the abnormality at issue, the ACA shall attempt to eliminate or reduce, to the extent feasible, the introduction or continuation of such genetic abnormalities in the ACA registry *without knowledge or awareness*.

Recognizing the wide range of breeds included in animals eligible for registry in the ACA herd book and the potential introduction of genetic abnormalities from those sources the ACA will establish a listing of abnormalities to be monitored in animals and their progeny registered in the ACA herd book. From time to time, as needed, the Board of Directors will update the "Monitor" status to genetic defects of concern to ACA members. Testing requirements as outlined below will become effective once this status has been assigned.

2. Required Testing Populations:

A. A.I. Sires

As of July 1, 2011:

- *ACA registered A.I. sires will be required to be tested for genetic abnormalities recognized as monitor status by the ACA based on breed makeup* ***before calves will be registered in herds outside that of the current owner****, unless they are Expected Free by Pedigree (XX-EFP).*
- *If the AI Sire is not a registered ACA sire but is registered with another association, the sire's status for breed relevant genetic abnormalities must be known according to their breed makeup as outlined below.*
    - *If AI sire has Angus genetics – AM, NH, and CA status required*
    - *If AI sire has Maine-Anjou genetics – TH and PHA status required*
    - *If AI sire has Shorthorn genetics – TH and PHA status required*
        - *"status" meaning free by test, expected free by pedigree, suspect or unknown with validation from respective breed association.*
        - *The right to require subsequent testing based on current status is reserved by the ACA staff*

- *If AI sire is not registered or has a parent that is not registered with any association and thereby "commercial" – AM, NH, CA, TH, and PHA testing is required regardless of breed makeup or combination.*

These requirements are in addition to the long standing requirement of DNA parent validation of A.I. sires.

Both the abnormality testing and parent validation testing are at the expense of the bull owner.

B. Donor Females

Embryo donor dams currently registered in the ACA Herd book will only be required to be tested for genetic defect of which they have been identified as being a ***Suspect (XX-S)****.*

If the embryo donor dam is not registered in the ACA herd book but is registered with another association, the donor will subject to test genetic abnormalities according to their breed association requirements or with validation from their respective breed association that such requirements have been met.

If donor is not registered with any association and thereby "commercial" – testing for AM, NH, CA, TH, and PHA is required regardless of breed makeup or combination.

These requirements are in addition to the long standing requirement of DNA parent validation of donor females.

Both the abnormality testing and parent validation testing are at the expense of the donor animal's owner.

C. Clones

Verification of clone status is required through DNA sample submission to approved lab for testing.

Once proven to be a clone, genetic abnormality status of the animal in which the DNA originated from shall be assigned to the clone.

These requirements are in addition to the long standing requirement of DNA parent validation of clone animals.

Parent validation testing are at the expense of the clone animal's owner.

3. Testing of Influential Sires

- *The ACA will, in an ongoing effort to evaluate the risk in the ACA herd book, test a sampling of influential sires as a risk assessment tool at the expense of the ACA.*
- *Influential sires are identified annually as the top 25 sires for ACA registrations in each of the Chianina, Chiangus, Chimaine, Chiford and Red Chiangus Registry for each fiscal year.*
    - *Sires to be tested must have registrations from multiple herds and have sired at least 20 animals for that year.*
- *Suspect status and subsequent testing requirements may be assigned to a pedigree if a "Carrier" animal or an "Afflicted" animal is identified out of a parent verified pedigree.*
- *The ACA reserves the right to conduct testing on influential AI sires for genetic abnormalities in which they are expected free by pedigree (XX-EFP) for at the expense of the ACA.*

4. Breeds of Inclusion and Interest

Genetic abnormalities will be designated a two letter code. If testing is required on an animal:

Table 1 contains the Genetic defects recognized as Monitor Status by the ACA, their respected breed of origin, and the initial test date. The breed makeup of an animal required to test will dictate those defects in which testing will be required.

Table 2 contains abnormalities monitored according to breed of origin and their respective initial test date *in which the ACA reserves the right to require testing for*.

TABLE 1. Abnormalities with Monitor Status

Breed	Genetic Abnormality	Code	Test As Of:
Angus	Arthrogryposis Multiplex	AM	December 1, 2009
Angus	Neuropathic Hydrocephalus	NH	December 1, 2009
Angus	Contractural Archnodactyly	CA	October 24, 2010
Maine-anjou/ Shorthorn	Pulmonary Hypoplasia with Anasarca	PH	December 1, 2009
Maine-anjou/ Shorthorn	Tibial Hemimelia	TH	December 1, 2009

Table 2. Abnormalities with Monitor Status related to other Breeds

Breed	Genetic Abnormality	Code	Test As Of:
Hereford	Hypotrichosis	HT	December 1, 2009
Hereford	Idiopathic Epilepsey	IE	December 1, 2009
Red Angus	Osteopetrosis	OS	December 1, 2009
Limonsin	Protoporphyria	PT	December 1, 2009

5. Official Designations on Registration Certificates and other Animal Records

The ACA will initiate a genotype designation scheme for DNA tested cattle and non-tested cattle at risk of being a carrier. These designations will appear as part of the animal's record in all documentation available to ACA members and other interested parties.

Actual Genotype designations (where XX is a two character abnormality code):

1. **XX-FT** = free by DNA test
2. **XX-C** = an animal that is determined to be a carrier by DNA test or is a confirmed parent of an afflicted progeny
3. **XX-A** = abnormality afflicted animal (homozygous recessive)designation for an animal, entered in the ACA herd book for parentage and official record reasons, reported to the ACA, diagnosed with the abnormality represented and parent verified. Parents would receive the XX-Carrier designation.

Inferred Genotype designations (where XX is a two character abnormality code):

1. ***XX-EFP*** *= expected free by pedigree; both parents are free of abnormality by test or expected themselves to be free by pedigree*
2. **XX-S** – designated on cattle with an ancestor with a XX-C designation or with a abnormality where no definitive ancestor has been identified as the initial pedigree source of the abnormality and in either case there is no intervening "Free" animal. This indicates the animal is a "Suspect" carrier until either a "Free" test result is submitted on an intervening pedigree animal or the animal itself has a test result submitted.

    a. As of August 2009 no animal has been identified in the Red Angus breed as the ancestor where the mutation occurred causing the OS genetic abnormality. All Red Angus animals will be designated with an OS-S status until an OS-Free animal is found within the pedigree.

3. **XX-U** – designation for animal with unknown parentage and/or untested lineage.

Inferred designations will be replaced with an actual genotype designation when an animal is DNA tested.

6. Testing Laboratories

The ACA will maintain a list of laboratories that can test cattle for each 'Monitor' status abnormality and will accept results from those labs.

Animals must be identified by registration number at the time the sample is submitted for testing.

Breeders should be aware that ACA's official lab for parentage, Igenity, provides abnormality testing services and if disputes occur that would require DNA parent verification of a sample it may be more cost effective for breeders to have the abnormality testing done at Igenity.

7. Testing and Shipping Fees:

Any DNA abnormality testing costs (including the diagnostic test, sample collection, preparation and shipping) associated with animals in any ACA members herd will be done exclusively at the expense of the member (unless animal falls into point 3. Testing of influential sires). A commercial producer (ACA non-member) that reports an abnormal calf (as outlined in section 8 of this policy) may be eligible for partial or full reimbursement of parentage testing costs. Abnormal calves reported by commercial producers, who's gross pathology indicates a novel defect or one not previously monitored by ACA through this policy and has an ACA registered sire, may have parentage validated by DNA testing at the request and expense of the ACA. The request for parentage testing and funding approval will be made by the ACA Board of Directors or a designated staff member assigned such discretion. The ACA may also provide funding to pay shipping charges associated with transport of the affected calf's carcass to the ACA's designated diagnostic veterinary laboratory.

8. Abnormal Calf Reporting

It is the duty of ACA members who become aware of an unusual physical abnormality, either in an animal registered with the ACA or in an offspring of an animal registered with the ACA, to notify the Executive Director of the ACA by e-mail or phone as soon as possible. Working with the Executive Director or other staff member designated by the Executive Director, the member may be required to take specific steps to best position the ACA and the member to preserve as much information about the situation as possible to aid in the scientific determination of the origin of the defect. Commercial producers utilizing ACA registered parents as breeding stock who produce abnormal progeny are also encouraged to contact the ACA to assist in resolution and determination of the cause of the abnormality. If a member or veterinarian employed by the member has questions as to whether or not the abnormality is severe enough to warrant such contact, should contact the Executive Director of the ACA at once to discuss and resolve the matter. Disclosure is ***always*** the best policy. Disclosure is especially important in the case in which abnormality appears in multiple animals in the herd or the member or consulting veterinarian are unable to identify a non-genetic cause for the abnormality.

Producers are encouraged to complete an official 'ACA Abnormal Calf Report' and photograph or video the affected animal as soon as possible. Additionally, the owner or

member should contact the ACA at once for further instructions. These instructions may include the collection of various tissues including blood for use in parent validation and the development of a pathology report by the ACA's designated veterinary diagnostic pathologist.

9. Breeder Awareness

The ACA will use its best efforts to alert members of potential carriers in their herd and will continue educational programs to assist breeders in their efforts to eliminate the 'monitored'abnormalities. However, the ACA assumes no liability for overlooking potential carriers or inadvertently naming potential carriers that may in fact not be carriers in member herds.

Staff will assist breeders in developing cost effective plans to test cattle, i.e. testing an old Angus suspect cow and finding her to be clean could eliminate the necessity of testing progeny and grand progeny.

10. Ethics

The ACA considers it an unethical practice to offer for sale a breeding animal or semen from an animal which is known to carry a deleterious genetic factor as defined by ACA without first informing the potential buyer or buyers of this fact. Any advertising, descriptive materials or pedigree initiated by the owner of a proven carrier or a potential carrier of a detrimental genetic factor as defined by ACA shall include a statement defining the deleterious factor or factors which the animal in question possesses. Any effort to conceal such information is considered to be equally unethical.