

# Alpha-Mannosidosis

Although Alpha-Mannosidosis (MA) is one of the oldest known genetic defects to be identified in Angus and Angus-derived cattle, awareness of the defect has been very limited among cattle producers. The knowledge of MA is largely due to the efforts of Angus Australia, as they met an MA outbreak head on and have since essentially eradicated the defect from their population. That eradication process was initiated in 1980 as the result of several Australian animals being diagnosed with MA. The development of a DNA test for MA in 1997 provided Angus Australia with an accurate tool for identification of carrier animals. Although Australia has the most experience with MA, it has been documented in other countries, including an American case in the late 1970s. In a preemptive move to prevent MA from having a large impact on the American Red Angus population, the DNA test for MA is now available in the United States.

## ***What is Alpha-Mannosidosis?***

Alpha-Mannosidosis is an inherited and lethal lysosomal storage disease of Aberdeen Angus cattle. Affected calves are born alive with no physical deformities. Prior to reaching sexual maturity, affected animals show severe, progressive neurological disease characterized by tremors of the head, loss of muscle coordination and aggression when disturbed. The net effect is eventual death.

## ***What is the inheritance pattern of Alpha-Mannosidosis?***

Identical to other genetic defects monitored by RAAA, the inheritance of MA is classified as simple recessive. Thus, only animals possessing two copies of the MA mutation will exhibit the genetic defect. Carrier animals (those animals possessing one copy of the MA mutation) will appear normal but, when mated to another carrier animal, will produce an MA-affected animal 25% of the time.

## ***Has RAAA Board of Directors implemented policy for Alpha-Mannosidosis?***

Yes, the RAAA Board accepted (with a unanimous vote) the Breed Improvement Committee's recommendation to implement policy for Alpha-Mannosidosis. The policy is identical to RAAA's policy for Arthrogyposis Multiplex (AM) and Neuropatheic Hydrocephalus (NH).

Beginning July 1, 2010:

- i. Animals applying for registration whose pedigree contains an MA-tested carrier within the first two generations (parents or grandparents) without an intervening MA-tested-free animal must be tested by an RAAA-approved facility to determine if the animal is a carrier or, free of MA. Registration of such animals will be placed on hold until approved test results are received by RAAA.
- ii. A.I. sires (sires with progeny applying for registration using RAAA mating code 1) and embryo donor dams (dams with progeny applying for registration using RAAA mating code 3) whose pedigree contains an MA carrier without an intervening MA-tested-free animal must be tested by an RAAA-approved facility to determine if the animal is a carrier or, free of MA. In the event that DNA is unavailable on an A.I. sire or embryo donor dam, then progeny will be required to be tested for MA as a requirement for registration.
- iii. Animals confirmed to be carriers of MA are eligible for registration.

***How do I send in a DNA sample for Alpha-Mannosidosis testing?***

Request a DNA collection device (hair or FTA blood card) from RAAA. Visit [redangus.org/registration/dna-parentage](http://redangus.org/registration/dna-parentage) for complete details.

***What tools will RAAA provide to assist members in managing Alpha-Mannosidosis?***

Identical to other genetic defects in which an approved DNA test is available, RAAA provides several tools that assist members in making the most informed decisions. RAAA's Genetic Defect Status Report will include MA, therefore, providing members with a tool to evaluate their active animals' exposure to each genetic defect. RAAA will maintain tested "Free" and "Carrier" lists which are available on the RAAA website, [redangus.org/genetics/defects/list](http://redangus.org/genetics/defects/list). Additionally, animals that have been tested for MA will be so noted by placing "MAF" or "MAC" following their registration number.