

## CURLY CALF SYNDROME INFORMATION FOR BULL BUYERS

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Curly calf syndrome is a lethal genetic defect that has been discovered in beef cattle. The calves are stillborn and have a twisted or curved spine and extended and contracted limbs. That is how it gets the term “curly calf syndrome.” This lethal genetic defect is called Arthrogryposis Multiplex (AM) with its name being of Greek derivation which means curved or hooked joints. It has been discovered in the Angus breed and genetically traced to a popular certain bull (GAR Precision 1680) in that breed.

It has been determined that the mode of inheritance for this condition is a simple recessive gene and can only be expressed when both genes are present. Its pattern of inheritance is similar to coat color for black and red in cattle or horned or polled. Animals with only one copy of the AM gene and one copy of the normal gene appear normal and are known as carriers. The condition (curly calf syndrome) can only be expressed when the individual is homozygous for the AM gene ( both genes are present in the affected calf) for the trait.

A DNA based test has been developed to identify individuals that have one copy or no copies of the AM gene. The American Angus Association designates those individuals as carriers with the letters AMC (AM carriers). Animals testing free of the AM gene are designated as AMF (AM Free). These designations will follow the animal's individual registration number on a pedigree. A large number of purebred Angus descendants of the known carrier have been tested AM Free. Those tested as known carriers are listed in the Angus homepage on the web ([www.angus.org](http://www.angus.org)). Not all animals need to be tested, only those that have ancestors in their pedigree that are known carriers would be necessary to eliminate the chance of the occurrence of curly calves in a breeding program.

Mating a carrier (AMC) bull to carrier females (AMC) will on the average result in 25% of the calves with the curly calf condition, 50% of the calves as carriers (AMC) and 25% of the calves as free of the lethal gene (AMF). These AMF calves if saved for replacements will never pass the lethal gene to their progeny. Mating a carrier bull (AMC) to non carrier cows (AMF) will result on the average of 50% of the calves as carriers of the gene and 50% of the calves free of the gene.

Sound selection decisions and breeding programs can be implemented to eliminate the occurrence of the curly calf syndrome. Commercial producers that use Angus bulls in their crossbreeding programs have a low probability of producing calves with the curly calf syndrome even if their bull they are using has an AMC ancestor in his pedigree. However, if they saved heifers for replacements from the previous bull that had an AMC in his pedigree, they need to make sure that their next bull purchase is not himself an AMC. The elimination of this condition can be very manageable if proper records are maintained in a commercial cow calf program.

Since the industry has now developed DNA markers for the AM gene, purebred breeders can now identify suspected carriers of the AM gene(those individuals that have GAR Precision 1680 in their pedigree). Because of the mode of inheritance, it is important to recognize that not all descendants of this bull are AM carriers. This test will provide the breed a very manageable means of eliminating carriers and eventually the gene from the population.