



# Genetic Defects... Better Safe than Sorry

by Larry Keenan  
RAAA Research/Special Projects Coordinator

Many breed associations have had the unfortunate experience of fighting through a genetic defect outbreak. Those of you who keep up with other breeds may be familiar with Tibial Hemimelia (TH) and/or Pulmonary Hypoplasia with Anasarca (PHA). Initially, attempts to control these genetic defects met with limited success because the respective breed associations had no policy for reporting abnormal animals and placing carrier animals on a published list. While implementation of genetic defect reporting rules are getting the outbreaks under control, the fact of the matter is, if a genetic defect reporting rule had been in place, and members reported all abnormal animals produced on their operation, there would not have been a widespread outbreak.

Although Red Angus is not experiencing a genetic defect outbreak it is important that we take a proactive stance to prevent such an outbreak. Therefore, a genetic defect reporting rule has been developed, approved by the RAAA Board, and placed into effect as of 1-1-2007. This rule requires Red Angus members to report all abnormal animals (fetuses, calves, cows, bulls, etc) to the RAAA National Office.

Approximately 90% of yearling Red Angus bulls are put to work in commercial cow/calf operations. Therefore, commercial producers are encouraged to report abnormal progeny out of registered Red Angus bulls to the RAAA National Office.

It is important to realize that no animal specie is immune from genetic defects. Several genetic defects have been discovered, and for the most

part eliminated, in breeds of cattle. Unfortunately, due to their inheritance pattern, genetic defects can remain hidden for many generations before showing up. For an explanation of inheritance, let's consider genetic defect "dd", with each d representing the genetic material inherited by the animal's sire and dam. D = normal gene, d = defect gene. Because the vast majority of genetic defects are only expressed in animals which possess two defect genes (d), animals that possess one normal gene (D) will appear normal. Animals that possess one normal gene and one defect gene (Dd) appear normal and are termed "Carriers".

**DD** = Normal appearing animal, no defect gene

**Dd** = Normal appearing animal, one defect gene. a.k.a Carrier

**dd** = Defect expressed

**Figure 1.**

		Sire	
		D	D
Dam	D	DD	DD
	d	Dd	Dd

**Figure 2.**

		Sire	
		D	d
Dam	D	DD	Dd
	d	Dd	dd

When a sire/dam passes on genetics to their offspring, they randomly pass on one of their two genes. As shown in Figure 1, all progeny from a DD animal mated to a Dd animal will appear normal. The mating that

will allow the defect to express itself is when a Carrier (Dd) animal is mated to a Carrier (Dd) animal. As presented in Figure 2, on average this mating will result in 25% DD, 50% Dd, and 25% dd. So, even in a worst case scenario 75% of the offspring will appear normal.

It is due to this inheritance pattern that defect genes can hide themselves for many generations before they are discovered. Obviously, the key to identifying and eliminating genetic defects from a breed is catching the defect gene before it is spread throughout the population. This is accomplished by observing all calves born on an operation and reporting abnormal appearing calves to the RAAA National Office. Do not pass off an abnormal animal as a "freak of nature" and fail to report it. If it happens once in your herd, it will likely happen again. Even worse, don't take matters into your own hands by not reporting an abnormal animal and simply eliminating the sire and dam from your herd. These erroneous mentalities greatly reduce the Association's ability to eliminate genetic defects from our breed.

If you become aware of an abnormal animal, immediately contact the RAAA National Office. To facilitate an accurate diagnosis, it is imperative that the abnormal animal is not destroyed as blood and/or tissue samples may need to be taken. Do your part in keeping our great breed free from genetic defects; report abnormal animals. To learn more about Red Angus' genetic defect reporting rule, visit [redangus.org](http://redangus.org). ■