

NEW RESOLUTIONS

Require Disclosure of Cerebellar Abiotrophy and Lavender Foal Syndrome Carriers

by Scott Benjamin and Beth Minnich

In mid-November at the AHA Convention in Reno, Nevada, the delegation, with unanimous support from every committee to which the resolutions were referred, voted overwhelmingly to approve Resolutions 3-09 and 4-09 concerning the disclosure of cerebellar abiotrophy (CA) and lavender foal syndrome (LFS), respectively.

These resolutions mandate the addition of language to the AHA Code of Ethics that will require members offering horses capable of reproducing in any transaction such as breeding, leasing and/or transfer of ownership to disclose CA and LFS status of the horse in question, should that status be known via direct testing, progeny testing, or diagnosis. The resolutions also mandate mare owners to disclose CA- and LFS-affected status of all foals to the owner of the foal's sire and cooperate fully with the stallion owner to validate the findings via testing and verification. This now means that the ethical obligation, which has always been inherently present for stallion owners and sellers, now has a formal place in the code of ethics that applies to all AHA members.

This expansion of the AHA Code of Ethics language concerning CA and LFS joins the mandatory disclosure language for severe combined immunodeficiency (SCID) that has been in place since 1984. As breeders, owners, trainers, and agents operating according to the requirements of AHA, we have been responsibly and effectively managing SCID within the existent population of Arabian horses for 25 years. Disclosure of SCID status was the first step in ensuring a better and brighter future for the Arabian breed. The addition of CA and LFS disclosure will move us one step closer to the systematic control and potential eradication of these known debilitating genetic diseases from our breeding population, not only in the United States, but it is to be hoped, worldwide.

The genetic sequences that can result in both CA and LFS have been present in the breeding population for well over a century, and possibly centuries prior. These are not new conditions affecting the Arabian breed. What *is* new is the ability to test for the presence of the genetic sequences that can cause both CA and LFS. With these scientifically sound tests readily available and relatively inexpensive to conduct, we can begin to test our breeding population with confidence, and thoughtfully manage mating decisions based on the results.

Like SCID, CA and LFS are simple autosomal recessive traits. Simple recessive traits are much easier to manage with breeding practices and mating schemes than are dominant traits (such as HYPP [hyperkalemic periodic paralysis] in Quarter Horses). Recessive traits are not expressed when present on only one chromosome (of a pair) for any given horse — these individuals

The good news is that breeding clear tested individuals with each other, or breeding carrier tested individuals with only clear-tested horses will never produce an affected foal.

are known as carriers (and are considered heterozygous for the trait). Recessive traits can only be expressed when the gene sequence is present on both chromosomes — these individuals are referred to as affected (and are considered homozygous for the trait). In the case of LFS and SCID, affected (homozygous — two genes present) status is lethal; foals will not survive to adulthood. With CA, affected-status foals can appear normal for an extended period of time. As they mature, however, their physical condition will deteriorate, requiring either intense environmental and behavioral management or euthanasia.

The good news is that breeding clear (no genes for CA, LFS, or SCID) tested individuals with each other, or breeding carrier (only one gene sequence present for CA, LFS, and/or SCID) tested individuals with only clear-tested horses will never produce an affected foal. This breeding strategy has worked effectively in the management of SCID and has subsequently reduced the incidence of this condition in the

The understanding of SCID “high-profile” carrier horses has taught us that genetic diseases can be responsibly managed without eliminating carrier horses from the breeding population.

breeding population. That should be our aim and ultimate goal with CA and LFS as well.

Fortunately, the understanding of SCID and the management of several “high-profile” carrier horses over the last two and half decades has taught us all that genetic diseases can be responsibly managed and their incidence reduced, without altogether eliminating carrier horses from the breeding population. These success stories reflect progressive and responsible breed stewardship, ensuring the generational progress of the Arabian through the selection of those individuals with the desirable phenotypic traits of the carrier parent, while minimizing the occurrence of the undesirable genetic sequence that causes the debilitating disorder.

It is imperative to remember that random genetic

mutations that have resulted in physiologically detrimental genetic diseases occur in all purebred breeds of livestock and pets that have been domesticated and selectively bred by humankind. Ours is not the only breed of horse or animal to be affected by the laws of nature. The closure of any gene pool to establish “purebred” status of any breed of animal effectively reduces the genetic variance available in the larger species population as a whole. This reduction of variance inevitably results in higher gene frequency rates for any number of genetic combinations, especially those that manifest phenotypic traits considered desirable by breeders. As we employ the tools of selection and mating systems, we often breed horses of similar phenotype to “fix” desirable traits. These phenotypically similar individuals will often share the same common ancestors, increasing the likelihood that identical gene combinations may be inherited from both sides of the pedigree. This is the desired result when selecting for the traits we deem “advantageous.” Unfortunately, genetic combinations with recessive expression that result in physiologically debilitating diseases may also be inherited when mating related individuals. These undesirable combinations

(Continued on next page)

NEW RESOLUTIONS *(continued)*

would not have manifested themselves with notable frequency in the random mating of more unrelated individuals within the overall population.

The conditions known as SCID, CA, and LFS were present in the genetic code of one or more of the most outstanding individuals in the Arabian breed at some early point prior to global diaspora in the 19th and 20th centuries. It is because these individuals possessed the best combination of desirable phenotypic characteristics that breeders selected them to create subsequent generations of Arabian excellence. Over time, the descendants of these superior individuals would inevitably be mated to one another, whether closely or more distantly related to each other, resulting in the potential homozygous occurrence (pairing-up) of the genetic disease gene combinations that had been undetected prior to that point. Intensive inbreeding and linebreeding (especially with a more narrowly defined gene pool) within a breed may potentially increase the manifestation of these detrimental gene combinations in earlier generations. Even careful linebreeding of distantly related horses and outcrossing can result in the phenotypic expression of undesirable genetic

diseases. As breeders, we must understand and respect the laws of nature, and make sound and knowledgeable breeding and selection decisions.

As with SCID in the past, we must be proactive in our approach to cerebellar abiotrophy and lavender foal syndrome, disclosing results of carrier individuals, especially those high-profile horses with a broad genetic impact, and thoughtfully and carefully select breeding individuals with the most exemplary combination of phenotypic characteristics while reducing the incidence of genetic disease carriers in the overall population. This task will take decades and generations to accomplish and will require the combined effort of breeders and governing bodies around the world if success is to be realized. It is our mandate and responsibility as stewards of the Arabian breed.

These will not be the last genetic diseases we will encounter in our lifetimes. Learning to deal with these diseases effectively with the available knowledge and scientific tools will empower us all to meet more successfully the inevitable challenges ahead.