

Lavender Foal Syndrome (LFS)/Coat Color Dilution Lethal (CCDL)

Lavender Foal Syndrome (LFS) or more appropriately, Coat Color Dilution Lethal (CCDL), is a genetic disorder with neurological features thought to be caused by a brain lesion. An affected foal often has a difficult delivery (dystocia), cannot stand at birth and usually has episodes of tetany where the foal rigidly extends its limbs, neck and back. Although these episodes resemble a seizure disorder, this is less likely as these affected foals are not normal between episodes and their state of alertness is usually not affected. Affected foals are usually euthanized within days of birth.

LFS foals are frequently born with a telltale diluted coat color that lightens the coat hairs, giving the foal an unusual appearance that can appear pale lavender, pale pink or even silvery, hence the name "coat color dilution" or "lavender foal". The eye color has also been described as grayish-brown or having a bluish tint. However, not all foals will have the unique coat coloration (although they may be paler than a normal foal) and if the coat color is overlooked or not present, foals may be misdiagnosed as having neonatal maladjustment syndrome (known as "dummy" foals), due to a lack of oxygen from the dystocia or misdiagnosed as having some type of spinal cord injury. It is important to note that this coat color dilution differs from grey foals in that greys are born a dark color and lighten with age. It is also different from roan, because the hair is of a uniform shade, not of intermingled light and dark hairs.

A disturbance in the nervous system prevents foals with LFS from being able to stand, and often they cannot attain sternal recumbency (to roll from their side to sit upright, resting on the sternum). They generally lay with their head and neck drawn back, with the body and legs rigid (this is known as opisthotonus) and the foal may make paddling motions with their legs. The paddling movement seen in LFS foals may be the result of the foal's effort to correct their position and gain sternal recumbency. Or alternatively, these movements could represent partial seizures. Involuntary, rapid eye movements (nystagmus) are also present in some LFS foals.

Although unable to right itself, a LFS foal may have a strong suckle reflex and may be bottle fed. However, these efforts are usually futile. Foals with LFS often have tetanic episodes and if they do not die, they are usually euthanized within a few days of birth on humane grounds, as they are incapable of survival.

Necropsy studies have found no gross or microscopic abnormality in the central nervous system of these foals. It is suspected that a neurochemical or submicroscopic structural abnormality is the cause of the clinical signs.

LFS is relatively rare and the mode of inheritance has not yet been determined. However, it has been proposed by some researchers to be an autosomal recessive trait (meaning that it is not sex linked and both parents must carry and pass along a copy of the mutated allele for an affected foal to be born). There has also been some discussion that multiple genes may be involved. Some researchers have also proposed a potential genetic relationship between LFS and Juvenile Epilepsy. It is important to note that while LFS is usually associated with horses of Straight Egyptian or heavy Egyptian breeding, it has been reported in other breeding groups.

UC Davis in California and Cornell University in New York have been involved in LFS research. Interested persons should contact:

Dr. Cecelia Penedo
Veterinary Genetics Laboratory
One Shields Avenue
Davis, CA 95616-8744
Phone (530) 752-2211
Fax (530) 752-3556
Email: mctorrespenedo@ucdavis.edu

Dr. Doug Antczak
The Equine Genetics Center.
James A. Baker Institute for Animal Health
College of Veterinary Medicine, Cornell University
Ithaca, NY 14853, USA
Phone (607) 256-5621
Fax: (607) 256-5608
Email: dfa1@cornell.edu

Reference Materials

1. AHA Equine Stress, Research and Education Committee. "Caution & Knowledge." *Modern Arabian Horse*, August/September 2007, pp. 100-105.
Online version: <http://modernarabianhorse.epubxpress.com/link/ahorse/2007/aug-sep/102>
2. [Fanelli, H.H. "Coat Color Dilution Lethal \("lavender foal syndrome"\): A Tetany Condition of Arabian Foals" *Equine Veterinary Education*, 2005 17 \(5\) 260-263.](#)
3. Page P, Parker R, Harper C, Guthrie A, Nesar J. "Clinical, clinicopathologic, postmortem examination findings and familial history of 3 Arabians with lavender foal syndrome." *J Vet Intern Med*. 2006 Nov-Dec;20(6):1491-4. Department of Companion Animal Clinical Studies Faculty of Veterinary Science, University of Pretoria, Onderstepoort, South Africa. PMID: 17186871
4. ["Lavender Foal Syndrome Fact Sheet." James A. Baker Institute for Animal Health, Cornell University.](#)
5. [Judd, Bob, DVM. "Lavender Foal Syndrome: 11/23/05" *Texas Vet News*, Texas Farm Bureau Radio Network.](#)

Compiled by Beth Minnich with contributions from Dr. Alexander de Lahunta, Brenda Wahler and Lisa Goodwin- Campiglio. A special thank you to Dr. de Lahunta for his assistance in preparing this article.