EQUINE DISEASE QUARTERLY

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COMMENTARY

IN THIS ISSUE

UK
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College of Agriculture
Department of Veterinary Science

LLOYD'S

"PLEASE HELP! My 10-year-old Quarter Horse has been down in the pasture for two days and won't get up. What should I do?"

"A week ago I saw my horse bitten by a skunk in broad daylight. I dressed the wounds, but after searching the internet, I'm concerned about rabies. Should I vaccinate him?"

To an equine practitioner, these sound like typical telephone calls on a late Friday afternoon. However, the downed horse scenario was emailed to the editor of a national horse magazine; the skunk bite incident was emailed to an extension veterinarian in a state 500 miles away from the horse and owner.

The advice was the same in both cases: "Call your veterinarian immediately!"

We are in an information-rich technological society where people can find virtually anything (fact and fiction) on the internet via computer or even cell phones. Too often, people check out their animals' symptoms in chat rooms and at horse health sites, trying to make a diagnosis. In the cases above, "experts" for a free email consultation are also found online. With the advent of some internet sites selling prescription veterinary drugs without a legal veterinary prescription, individuals can try "cheaper" ways of treating animals without paying for the veterinarian's farm call and expertise.

Inherent dangers loom in shaving corners this tightly.

In the above cases, a horse that is down for two days is in serious trouble, and a veterinarian should have been called as soon it was determined the horse was recumbent and unable to rise. After 48 hours, veterinary treatment for such a case will have a significant cost, even if the horse can be saved.

Any domesticated animal bitten by a wild animal needs to be evaluated by a veterinarian. Skunks are nocturnal animals, and movement during the day is abnormal behavior, warranting suspicion of rabies, especially in endemic states. All animal mouths teem with bacteria, and serious bacterial infections can result from bites as well.

A working relationship with a veterinarian can *save* money in the long run. With an initial visit, a comprehensive, individualized vaccination and deworming program can be designed, eliminating guesswork by the owner and the using of products that might not be needed in his or her locale. According to the latest research, there is no one-size-fits-all for vaccination and deworming programs.

In cases of horse death or abortion, veterinarians can submit samples to diagnostic laboratories for a proper diagnosis in an effort to prevent further cases. With complex, unusual cases, the farm veterinarian can access expertise from veterinary specialists at universities or specialty practices with a phone call, an option generally unavailable to a horse owner.

All costs relative to owning a horse have risen significantly over the past year. Establishing a veterinarian-client-patient relationship with your local practitioner is the most cost-effective way to ensure the health and welfare of horses.

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INTERNATIONAL

Fourth Quarter 2007

THE INTERNATIONAL Collating Centre, Newmarket, England, and other sources reported the following disease outbreaks.

A clinically severe outbreak of Atypical Myoglobinuria/Myopathy (AM) was diagnosed among eight non-Thoroughbred horses on three premises in Switzerland. AM is a frequently fatal disease of grazing horses with unknown etiology. It is recognized in several European countries, including the United Kingdom, where it was first reported in 1942. The disease has a sporadic incidence and has been associated with adverse weather conditions. Diagnosis is based on clinical, biochemical, and pathological findings, including histopathology of muscle tissue.

Sporadic cases of Equine Herpes Virus abortion (EHV-1) were reported from Argentina, Germany, France, Ireland, Japan, the United Kingdom, and the USA. Multiple cases were reported from South Africa on four premises involving Thoroughbreds and Warmbloods. Respiratory disease attributable to EHV-4 was reported among foals on a premise in Argentina and among racehorses on a premise in Japan and to EHV-1 on multiple premises in France among various breeds of horses. A single case of EHV-1 infection was diagnosed at Churchill Downs Racetrack, Kentucky, attributable to the non-paralytic strain of the virus.

In France cases of Equine Infectious Anemia (EIA) were identified among eight horses on three premises in proximity to premises where EIA had been confirmed earlier in the year.

For 2007 the U.S. Department of Agriculture (USDA) confirmed 197 equine cases of Eastern Equine Encephalitis (EEE) throughout the USA, with the largest numbers recorded in Louisiana (42), Indiana (33), Mississippi (30), and Texas (30). Over the same period, 452 equine cases of West Nile Virus infection (WNV) were reported, concentrated in Texas (90), Montana (36), Colorado (29), and California (28). Cases of equine influenza were reported from Australia, France, Ireland, Japan, Sweden, Switzerland, the United Kingdom and the USA. Grass Sickness was diagnosed among two horses in Switzerland. Piroplasmosis was confirmed from South Africa, Switzerland, Turkey, and the United Arab Emirates. Two abortions attributable to *Leptospira* infection were diagnosed in the United Kingdom.

An extensive outbreak of rotavirus infection among foals was confirmed on four premises in Argentina. Fatalities occurred as a result of multiresistant antibiotic *E. coli* septicaemia. An outbreak of salmonellosis was diagnosed on one premise and in a veterinary hospital in the United Arab Emirates. Strangles was reported from Ireland (19 premises), South Africa (five premises), Sweden (multiple premises), Switzerland (four premises), and the United Arab Emirates among two quarantined horses recently imported from Argentina and Uruguay.

CORRECTION

AN ARTICLE ON EQUINE GLANDERS published in the January 2008 issue of the *Equine Disease Quarterly* incorrectly included the United Arab Emirates (UAE) among countries in which the disease was stated to be endemic. While the disease was introduced into the UAE with a shipment of horses in 2004, the occurrence was confined to the post-arrival quarantine facilities. It should be noted that glanders has never been officially recorded in the country's resident equine population. The editors deeply regret any confusion that may have arisen over the misrepresentation of the glanders-free status of the UAE.

Equine Disease Quarterly

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NATIONAL

Fire Ants and Horses

FIRE ANTS DELIVER a simultaneous bite and sting that are very painful and give them their infamous name. The threat of fire ants to healthy, ambulatory adult animals is fairly minimal. However, fire ants can be a significant threat to recumbent animals and to newborns if they lie down or are born on or near an ant bed. Before any field procedure, an essential routine for veterinarians is surveying the planned work area for any fire ant beds.

Immediate clinical signs of fire ant bites include intense pain, pruritis, and erythema. Fire ant venom is composed mainly of piperidine alkaloids and is less than 1% proteinaceous. Stings usually develop into pustules within 12 to 24 hours due to local necrosis caused by the piperidine alkaloids. Sometimes only secondary lesions such as erythema and epidermal collarettes may be noticed; affected skin may feel thickened and corrugated.

Neonates can be killed if attacked by the many ants inhabiting a mound, but adult animals are unlikely to die as a result of fire ant stings. The overall severity of clinical signs and disease is likely due to the number of ant stings suffered. The author has seen a weanling horse that developed severe laminitis as a complication of multiple fire ant stings with nearly one entire side of the body affected, necessitating euthanasia. Anaphylactoid reactions are rare without massive exposure to stings and occur in those animals hypersensitive to the protein portion of fire ant venom.

Treatment of fire ant stings is largely symptomatic. The ants often remain attached, and mechanical removal or bathing is needed. The main goal of treatment is to reduce pruritis and pain using topical or parenteral corticosteroids (dexamethasone, 0.05-0.2 mg/kg, IV, every 12 to 24 hours) and nonsteroidal anti-inflammatory drugs (flunixin meglumine, 1.1 mg/kg, IV or PO, every 12 to 24 hours). Antihistamines (tripelennamine 1.1 mg/kg, IM, every 6 to 12 hours) may also be of benefit. Affected animals should be observed for any possible secondary complications such as laminitis, respiratory difficulty, abortion, etc. Most will have a full recovery after several days of mild to moderate pruritis and dermatitis.

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Managing Imported Fire Ants in Horse Pastures

IMPORTED FIRE ANTS (*Solenopsis invicta* and *Solenopsis richteri*) were accidentally introduced into Alabama from South America more than 75 years ago. The Southeastern United States and a few counties in New Mexico and California are infested (see Figure 1) with these insects, which produce painful stings to both people and animals. They live in the soil, with each colony having one or more fire ant queens that lay eggs and control activities within the colony. There can be 40 to more than 300 fire ant mounds per acre in a typical pasture. For an estimate as to how far north imported fire ants can spread, see: http://www.ars.usda.gov/Research/docs.htm?docid=9165.

If fire ants are present in horse pastures, owners need to decide if it is worth treating the pastures. Apart from horse health concerns, these pests can interfere with haying operations and damage electrical equipment. However, fire ants are good predators, and they help reduce tick populations. See http://www.extension.org/fire+ants for more information about the biology of imported fire ants and their impact.

To reduce the number of imported fire ants in pastures, several baits can be broadcast applied. The bait consists of an active ingredient and a food attractant that has been placed on a carrier particle. The baits are designed to be picked up by foraging fire ants, taken back to the nest, and fed to various members of the colony, including the queen. Depending on the size of the area to be treated, the bait can be applied using a small hand-cranked seeder, a motorized seeder, or an airplane. Cost of a bait application is about $10-$15 per acre. Choose a pesticide that is labeled for

pastures or hayfields (versus lawns, turf, and ornamental plants). A variety of baits can be applied to horse pastures, including hydramethylnon, pyriproxyfen, s-methoprene, and fenoxycarb. More information can be found at www.extension.org/faq/824.

A particular fire ant control product may not be registered (legal to use) in every state. This is especially true for states with very few fire ant-infested counties. Purchase fire ant control material in the state of residence, and ensure the pesticide is labeled for fire ants and pastures. As with all chemicals, follow manufacturer's directions for safe application.

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KENTUCKY

Equine Placentitis: Common Causes and Newly Emerging Pathogens

DURING THE PAST SIX YEARS (Jan. 2, 2002 – Jan. 31, 2008), 1,429 cases of equine placentitis have been diagnosed at the University of Kentucky Livestock Disease Diagnostic Center (LDDC). Of these, 1,189 cases had an infectious agent identified. Various bacteria were isolated from 1,125 cases (Figure 2), and 64 had fungus cultured.

Since the 1998 and 1999 foaling seasons, in which 94 and 144 cases of nocardioform placentitis cases were diagnosed respectively, the number of nocardioform placentitis cases has decreased dramatically, with only 93 cases over the last six foaling seasons (2002-1/2008).

Two bacterial agents have been diagnosed over the past six years that represent potential newly emerging abortigenic pathogens and causes of placentitis: *Mycobacterium spp.* and *Cellulosimicrobium cellulans* (formerly called *Oerskovia xanthineolytica*).

The LDDC received six cases of mycobacterial abortion and placentitis with the diagnosis confirmed by microbiologic, polymerase chain reaction (PCR), and/or histochemical staining procedures. Mycobacterial isolates were cultured and sequenced by the use of PCR analysis identifying isolates of the atypical Runyoun groups. These atypical mycobacteria are within the non-tuberculous group and are classified as saprophytic and opportunistic microorganisms acquired from the environment (soil, water, and/or decaying vegetation). Gross lesions observed within the submitted cases varied from none to those of a "nocardioform-like" placentitis, which is characterized by the presence of variable amounts of thick, mucoid, viscous exudate and placentitis predominantly located on dependent regions of the chorion, particularly at the base of the horns and body region. Affected fetuses had variable degrees of emaciation and chronic placentitis. Several fetuses had granulomatous to pyogranulomatous pneumonia, and one fetus without pneumonia contained disseminated granulomas in various organs.

Cellulosimicrobium cellulans is a gram-positive, branching bacillus that forms vegetative hyphae on nutrient agar and is an opportunistic microorganism insidious to the environment (particularly the soil). While these organisms have been referred to as "nocardia-like" organisms based on their basic morphology, *C. cellulans* bacilli are motile and do not form aerial mycelia like *Nocardia* species. The nine equine cases of *C. cellulans* abortion and placentitis submitted to the LDDC were noted to produce "nocardioform-like" placentitis lesions as well as granulomatous pneumonia. These findings make it difficult to differentiate a true nocardioform placentitis from a *C. cellulans*-induced placentitis solely on gross examination; therefore, bacteriologic and molecular biologic testing are essential for differentiating these two agents.

Placentitis continues to represent a significant problem and common cause of equine abortions. It is important to recognize that newly identified bacterial causes of placentitis and abortion are being diagnosed and may be emerging as potentially significant abortigenic pathogens. Atypical *Mycobacteria* and *C. cellulans* can cause similar gross and histologic lesions within the fetus and/or placenta and should be considered as differential diagnoses when encountering lesions suggestive of nocardioform placentitis.

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CONTROL OF EASTERN TENT CATERPILLARS (ETC)

The main preventive approach on many farms has been removal of wild cherry trees (the favorite "host" tree for ETC) in fence rows. Check for any regrowth of trees that might have occurred during the past few years. Insecticidal products and application methods are available if caterpillar populations rebound (For more on ETC control strategies, go to http://www.ca.uky.edu/gluck/mrls/2007/info%20pages/040507Strategies.htm).

If insecticides are to be used, they must be applied after egg hatch is complete and when softball-sized tents are visible in trees.

Four elements of an ETC control program are:

- Timely detection of active ETC nests and feeding caterpillars in trees
- Application of an appropriate insecticide with proper equipment if ETC populations are judged to be moderate or greater
- Protection of people, animals, and the environment
- Follow-up inspection of treated areas five to seven days later to evaluate results and to check for additional tents

Except for some specific isolated areas where black cherry trees are abundant, ETC numbers in Central Kentucky have decreased significantly since 2002.

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Mare Reproductive Loss Syndrome Update

AN ABORTIGENIC DISEASE known as Mare Reproductive Loss Syndrome (MRLS) significantly impacted the horse industry in the Ohio Valley in late April and early May, 2001 and 2002. In 2001, approximately 25% of all pregnant mares aborted within several weeks (over 3,000 mares lost pregnancies), and abortion rates exceeded 60% on some farms. MRLS was a newly recognized disease, and it cost the state of Kentucky approximately $330 million in 2001 alone (Thalheimer *et al.,* 2001).

An epidemiologic survey conducted in the summer of 2001 revealed a temporal correlation between MRLS and presence of eastern tent caterpillars (ETC; *Malacosoma americanum*) on horse farms (Dwyer *et al.,* 2003). However, a statistical correlation does not necessarily mean that the caterpillars caused the abortions, so several groups of scientists from around the country designed experiments to determine the role ETC, as well as other agents, played in MRLS. Summaries of those studies are available online at http://www.ca.uky.edu/agc/pubs/sr/sr2003-1/sr2003-1.htm.

Controlled research experiments performed as collaborative efforts by Drs. McDowell, Williams, Donahue, Webb (University of Kentucky) and Newman (Venture Laboratories, Lexington, Kentucky) demonstrated that horses will inadvertently eat ETC when the insects are present in the pasture or in other feedstuffs; MRLS-type abortions can be induced in experimental animals (mares or sows) by feeding them ETC; and the only part of the caterpillar that causes MRLS abortions is the exoskeleton (skin or cuticle). Eastern tent caterpillars are hirsute (hairy) caterpillars, and the experiments revealed that the hairs (setae) embed into the submucosa of the alimentary tract, creating microgranulomatous lesions (Figure 3). We hypothesized that those lesions allow bacteria from the mare's alimentary tract, principally streptococci and actinobacilli, to invade the mare's circulatory system. The bacteria then establish infections in tissues where the mare's immune surveillance is reduced, such as the fetus and placenta. Fetal/placental fluid bacterial infections lead to fetal death and abortion characteristic of MRLS (McDowell *et al.,* 2004; Webb *et al.,* 2004). Movie clips of horses consuming ETC can be viewed at http://www.ca.uky.edu/gluck/McDowellKJ.asp.

Abortions in Australia have been linked to hairy processionary caterpillars (*Ochragaster lunifer*), and experimental dosing of pregnant mares with processionary caterpillars via nasogastric tubing resulted in abortions with pathologic and bacteriologic findings similar to those characteristic of MRLS (Cawdell-Smith *et al.,* 2007).

Since 2002, only a few abortions have been diagnosed as MRLS at the University of Kentucky Livestock Disease Diagnostic Laboratory. These have only occurred sporadically and have consistently been temporally associated with the seasonal occurrence of ETC. Investigation of some of the cases has demonstrated potential exposure to ETC in the mares' environment.

References are available on the *Equine Disease Quarterly* web site for this issue, http://www.ca.uky.edu/gluck/q_apr08.asp.

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EIA Surveillance 2007

DURING THE 2007 calendar year, 128,912 serum samples were tested for Equine Infectious Anemia (EIA) in Kentucky. Private testing accounted for 111,607 samples. These samples were collected and tested to comply with state regulations governing the sale and exhibition of equine in Kentucky or to meet interstate transportation requirements. Another 17,305 samples were collected through the Kentucky Market Surveillance and Disease Investigation Program. Each testing program detected one EIA-infected equid.

An EIA-positive 23-year-old mare mule, privately tested for change of ownership, had resided in Christian County, Kentucky, for more than 15 years. Twelve other equine (nine mules and three horses) that had been companions of this mule were tested on multiple occasions and were determined free of the disease.

The other positive case, an Appaloosa gelding, was purchased at auction in Alabama on a Saturday night. The gelding was transported over the weekend to Kentucky and offered for sale the following Monday at a Kentucky-approved auction market where blood was drawn and tested positive for EIA under the Market Surveillance and Disease Investigation Program.

As can be seen in the accompanying chart, the number of samples tested has consistently increased during the past 20 years. The evidence continues to suggest a decreased prevalence of this virus within our equine populations, demonstrating the efficacy of consistent and accurate disease surveillance within identifiable populations.

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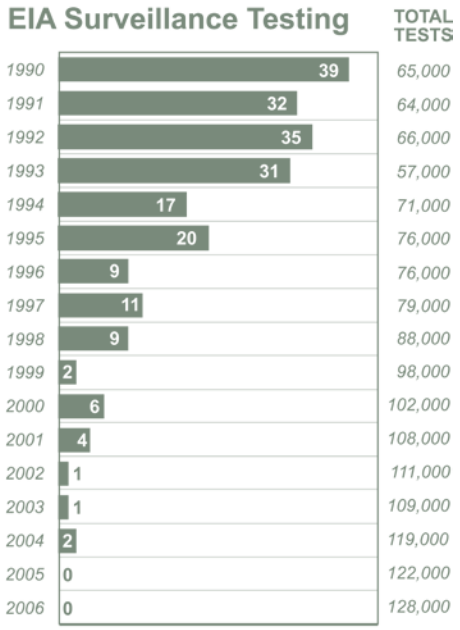
For more information on these, or any of our other equine programs, visit http://www.kyagr.com/statevet/equine/.



2006 results received through 1/30/07. Numbers within the bars indicate number of positive tests.

Equine Disease Quarterly Newsletter

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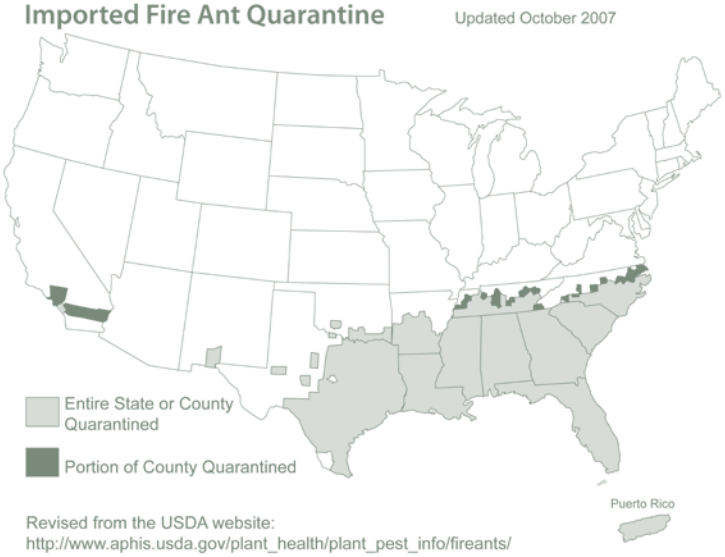
FIGURE 1.



Revised from the USDA website:
http://www.aphis.usda.gov/plant_health/plant_pest_info/fireants/

FIGURE 2.
Most common bacteria associated with cases of equine placentitis

BACTERIAL ETIOLOGIC AGENT	number of cases
Gram positive branching *bacillus*	168
Escherichia coli	120
**Leptospira* species	118
Streptococcus zooepidemicus	109
Streptococcus species	69
Streptococcus equisimilis	59
Pantoea (Enterobacter) agglomerans	52

*Diagnosed via fluorescent antibody (FA), microscopic agglutination test (MAT), and/or histopathology.

FIGURE 3. Photo of a seta (hair) attached to an eastern tent caterpillar.