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### **Neurological Equine Herpesvirus-1 Outbreak in Horses from Northern Wyoming**

Local veterinarians, assisted by diagnosticians at the Wyoming State Veterinary Laboratory (University of Wyoming), are investigating an outbreak of neurological disease in horses in Johnson County, Wyoming. Over 40 from a group of 180 horses have been affected by the outbreak, 1 horse has died, and 8 horses have been euthanized.

The first cases appeared in late June 2001. Clinical signs reported by the attending veterinarians included fever in a few horses and hind limb ataxia/weakness and urinary incontinence in many horses. Severely affected animals remained alert and responsive, but went down with paresis/paralysis of the hind limbs, weakness of the front limbs, and inability to rise. Subsequent cases were observed occurring in small “waves”, with the final few cases occurring approximately two weeks after the initial outbreak of disease.

Initial investigation of the outbreak centered on botulism from affected feed or environmental sources, or infection with equine herpesvirus type 1 (EHV-1). Preliminary testing of serum could not rule out botulism, and EHV-1 was not isolated from blood or tissues of affected horses. Botulism subsequently was ruled out by further testing of biological and environmental samples (including hay) at the Wyoming State Veterinary Laboratory (WSVL) and the California Animal Health and Food Safety Laboratory in Davis, California. Polymerase

chain reaction (PCR) tests performed at Colorado State University demonstrated EHV-1 in whole blood samples from one horse. Further testing at the WSVL revealed serological evidence of acute EHV-1 infection in many horses on the premises, with acute serum/virus neutralization titers of 1:256 or greater, or a four-fold rise in titers in most affected horses. Gross and microscopic lesions consistent with EHV-1 infection were identified in the brain and spinal cord of two horses that were euthanized due to severe neurological impairment. Lesions observed included characteristic perivascular inflammation, vasculitis and vascular necrosis, and hemorrhage throughout much of the brain and spinal cord. Additional testing is underway at the WSVL, including more virus isolation and PCR assays, as well as immunohistochemistry to detect EHV-1 in tissues.

Equine herpesvirus type 1 infection causes outbreaks of respiratory disease, abortion, and neurological disease. Clinical signs of the neurological form of EHV-1 disease include ataxia and gait abnormalities, hind limb weakness to paralysis, recumbent or downer horses, urinary incontinence, and in a few cases, complete paralysis and death. The prognosis for recovery is fair to good if recumbent horses regain the ability to rise and move about – horses that remain recumbent for more than a few days may not recover, and may require euthanasia. Permanent neurological deficits are possible sequelae of infection.

Like most herpesviruses, EHV-1 causes latent infections in horses, with viral shedding precipitated by stress or a change in environment. Infection with EHV-1 is very contagious and can be transmitted from horse to horse in fresh secretions or aerosols. The virus is not very hardy in the environment, however, and can be killed by most common disinfectants.

Vaccination for EHV-1 with approved killed vaccines (used according to label instructions) may help to prevent respiratory disease and abortions in horses; however, current

EHV-1 vaccines are not effective in preventing the neurological form of disease. In fact, there is controversial evidence that vaccinated horses may be at increased risk of neurological disease when compared with unvaccinated animals.

Neurological disease caused by EHV-1 usually occurs sporadically, affecting individual horses or small groups of horses on premise. Despite this fact, large outbreaks of EHV-1-associated neurological disease have been observed previously in the United States and Europe, with some outbreaks resulting in losses of up to 40 percent of affected animals. In such cases, over half of all exposed horses may develop some degree of neurological impairment. The reasons why some horses develop the neurological form of EHV-1 infection are unknown. Proposed reasons include a subtype of virus with specific tropism for or virulence in the brain and spinal cord, populations of horses that are uniquely predisposed to such infections, or perhaps reactions in vaccinated or previously exposed horses mediated by the horses' own immune systems. The typical lesions in the brain and spinal cord of affected horses involve damage to blood vessels, providing some support for the theory that an immune process is responsible for damage caused by the infection.

Given the contagious nature of this disease, it is recommend that affected herds/premises be quarantined for at least three weeks after the last affected animal has recovered. Contaminated instruments, clothing, boots, and tack used on affected/exposed horses should be cleaned and disinfected before moving between different groups of horses, to avoid transmitting the virus to susceptible animals. Feed and water that have been in contact with affected horses should not be shared with unexposed animals.

Investigation of the current outbreak of EHV-1 neurological disease in horses from northern Wyoming is ongoing. Controlling the outbreak currently is the top priority, and

measures aimed at minimizing the risk of transmission to other horses or premises are in effect. For more information about EHV-1 infection, or other neurological diseases of horses, contact your local veterinarian, veterinary diagnostic laboratory, or school or college of veterinary medicine.