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Introducing Zylexis, an inactivated (killed) Parapox Ovis Virus Immunomodulator.

EHV can be easily triggered by common stressors to horses like trailering, competition, breeding and environmental changes.

Administer Zylexis to horses prior to stressful events and provide them with a demonstrated level of protection against equine upper respiratory disease associated with EHV-1 & 4.

- Aids in reduction of upper respiratory disease caused by EHV-1 & 4 which are thought to latently infect 80% of horses.
- Stimulates immune response which is useful in reducing severity and duration of viral disease.¹
- None of the Zylexis horses had visible or palpable reactions at the injection site or systemic reactions.²



Schedule a course of Zylexis with your veterinarian today and keep your horses on the road to good health.

Pfizer Pfizer Animal Health



Zylexis™

Demonstrated Immunomodulator

¹ Ziebell KL, Steinmann H, Kretzdorn D, et al. the use of Baypamun N in crowding associated infectious respiratory disease: Efficacy of Baypamun N (freeze dried product) in 4-10 month old horses. *Zentralbl Veterinärmed B*. 1997;44:529-536.

² Data on File. Study Report No. Nov. 20, 2000

Herpes By the Numbers

BY KIMBERLY S. HERBERT



COURTESY DR. GEORGE ALLEN

There are nine types (species) of herpesviruses that affect equids; the domestic horse is host to five of those. The other four affect donkeys, zebras, and onagers (an Asiatic wild ass). Of the five that affect domestic horses, only three are known to commonly cause disease: equine herpesvirus-1 (EHV-1), equine herpesvirus-3 (EHV-3), and equine herpesvirus-4 (EHV-4).

Herpesviruses are species-specific, meaning if you have a cold sore caused by a herpesvirus, you can't give it to your dog or horse, and the herpesviruses that infect those species don't get passed to you.

The Maxwell H. Gluck Equine Research Center at the University of Kentucky serves as one of three international equine herpesvirus reference laboratories recognized by the Office International des Epizooties

Each type of herpesvirus can cause different problems in your horse; here's your reference for understanding more about these problems

(OIE). The others are in England and Russia.

The OIE designates these reference laboratories for every important animal disease. Each lab serves as a reference for information on that specific disease, provides reagents for testing, provides standard virus strains and standard antibodies for research, and investigates outbreaks of that disease. It's like a mini Centers for Disease Control (CDC) for each specific animal disease.

Easy Types First

Since there are two main types of herpesviruses that rarely cause disease in horses, let's take a look at them first.

The herpes family is divided into three subfamilies: alpha, beta, and gamma. That distinction is based on differing biological properties they have, such as growth rate, where they establish latency (in which cell type), and host range.

There are two equine gamma herpesviruses—EHV-2 and EHV-5. They are described as ubiquitous (everywhere), but rarely cause disease. EHV-2 is found in close to 100% of normal healthy foals.

The other three equine herpesvirus types are all alpha herpesviruses. There are no beta herpesviruses in horses.

There are a few diseases in which EHV-2 and EHV-5 sometimes have important



Some types of herpesvirus are found in 100% of horses, and others are rare. Once a horse is infected, it carries the virus for life (latency). Then when a horse is stressed, such as by transport or competition, the virus becomes active and can cause disease or be spread. (Above) A "snotty nose" could be herpesvirus, or some other upper respiratory disease. Testing is the only way to know for sure.



EHV-1 used to cause tremendous losses due to abortion storms on farms, but today's vaccination have nearly eliminated that problem.

involvement: conjunctivitis (eye inflammation) in young foals, and a forerunner infection that might predispose a young foal to Rhodococcal disease. Equine herpesvirus-2 and EHV-5 infect the upper airway of a foal (like a head cold) and suppress the immune system of the foal so it sets up the foal for secondary infection by *Rhodococcus*.

Rhodococcus equi is the most common bacterial cause of severe, sometimes deadly, pneumonia in foals. Pneumonia affects the lungs and isn't caused by herpesviruses.

EHV-3

Equine herpesvirus-3 causes a venereal disease known as equine coital exanthema. This is a rare disease, but it can be important when it occurs in a breeding shed during the breeding season. It doesn't cause mortality (death), and the disease is self-limiting (doesn't need treatment), but it has the potential to shut down breeding activities, which can be economically devastating.

There are characteristic lesions on the genitalia of the stallion and mare. Norm Umphenhour, DVM, of Ashford Stud Thoroughbred breeding farm in Versailles, Ky., wrote a textbook chapter on EHV-3 for *Infectious Diseases of Livestock* (see photos on pages 12-13).

EHV-3 causes characteristic lesions on the genitalia of the stallion and mare. People who prepare mares for mating and handle stallions should be trained to recognize and report the lesions. There are no systemic signs (such as fever).

The *Merck Veterinary Manual* states that for mares: "Red papules (small elevations of inflamed skin) appear in the vaginal and vestibular mucosa two to 10 days after infection, which occurs as a result of mating with an infected stallion. Lesions

not specifically inhibit fertility."

Mating of an infected stallion or mare should be delayed until the lesions completely heal. No active lesions means the virus is not shedding,

EHV-4

Equine herpesvirus-4 mainly causes upper respiratory disease that's non-fatal. However, it can cause severe and widespread outbreaks in young horses.

Horses showing clinical signs of EHV-4 disease are always young—foals through 3-year-old horses in training. It's not a problem in older horses that develop natural immunity.

Occasionally, there might be a sporadic case of a horse with EHV-4 infection that develops neurologic signs, but it's not numerically significant. There have been no more than three cases reported worldwide. Those cases might have been caused by EHV-1 that wasn't found in testing.

Similarly, abortions caused by EHV-4 are also rare and can be counted on the fingers of one hand. It's not frequent enough to be considered a problem.

EHV-1 Old and New

The "virus" that caused abortion storms (multiple losses on each farm) in the early 20th Century was first isolated in the 1940s. It was a long time before it was identified as herpesvirus, and longer still before it was understood to be EHV-1. It used to cause frequent abortion storms on farms worldwide.

Equine herpesvirus-1 causes many problems: abortions, respiratory disease, neurologic disease, and death in newborn foals. EHV-1 also is the cause of a newly recognized syndrome described as peracute vasculitis, a fatal disease of adult horses.

This disease happens so dramatically

extend to the perivulvar skin. The lesions progress rapidly to pustules, then ulcerate, and finally heal, leaving depigmented scars. A stallion shows similar lesions on the penis and prepuce. The disease causes discomfort and may prevent mating, but does

that it might be mistaken for African horsesickness. You can find a horse dead overnight with no preliminary signs or symptoms. It's a rapidly fatal disease of the lungs; a fulminating (occurring suddenly and with great intensity) infection of lungs. Fabio del Piero, DVM, Dipl. ACVP, PhD, of the Department of Pathobiology, University of Pennsylvania School of Veterinary Medicine, has published on a few cases (www.vetpathology.org/cgi/content/full/38/4/474).

It's an infection of capillaries in the respiratory tract, with edematous (fluid) filling of the lungs.

British researchers have found EHV-1 in stallion semen after experimental inoculation. It's possible that a stallion that was recently infected can shed EHV-1 in semen. There's no evidence that stallions become persistently shedding carriers like with EVA (equine viral arteritis). They shed only after active infection.

Brazilian researchers reported finding EHV-1 in semen and an embryo of animals not showing clinical signs of infection.

EHV-6, -7, -8, and -9

If you were a veterinarian in a zoo, you'd hear about these herpesviruses because they cause abortions, respiratory disease, and neurologic disease in captive equids (zebras, onagers, and Przewalski's horses). These four strains of herpesvirus cause the same diseases we see in horses, but in different equid populations. ◀

Editor's note: George Allen, PhD, head of the OIE Herpesvirus Reference Laboratory at the Gluck Equine Research Center, acted as a scientific resource in this article.



Four types of herpesviruses affect non-domestic equids such as zebras.