



# Equine Viral Arteritis

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Recently there has been increased interest in Equine Viral Arteritis (EVA) by veterinarians and horse owners. It has been identified in both New Mexico and Utah in 2006. Due to increased interest, this Fact Sheet serves to briefly address some of the more common concerns in regard to EVA: transmission risks, impact of the disease; control and prevention including vaccination and recommended bio-security measures.

## Equine Viral Arteritis

Equine Viral Arteritis is a disease of both horses and donkeys and the virus, equine arteritis virus (EAV), is widely distributed among equid populations throughout the world. It is called arteritis because of the distinctive lesions of inflammation in the muscle wall of small arteries in the acute phase of the infection. Horses infected with EAV display a range of presentations from subclinical infection (mild form with absence of apparent clinical symptoms) to an influenza-like illness in adult horses, abortion in pregnant mares, and pneumonia in neonatal foals. When illness does occur - usually within three to seven days of exposure - EVA can be difficult to diagnose because it is clinically similar to several other equine diseases such as equine rhinopneumonitis, influenza, equine infectious anemia (EIA), and purpura hemorrhagica. Most notable is that approximately 30 to 60 percent of exposed stallions become persistently infected carriers following natural EAV infection, whereas neither mares nor geldings become persistently infected with the virus. It is a manageable disease, if the control program aims at minimizing or eliminating direct or indirect contact of susceptible horses with the secretions/excretions of infected animals. Most critical to success of a control program is the aim to restrict the spread of EAV in breeding populations and the prevention of the establishment of the carrier state in stallions and post-pubertal (the stage of becoming capable of sexual reproduction) colts.

### Transmission Risks

EAV infection can be transmitted among horses in five different ways:

- Respiratory--primary route of acute transmission, common at racetracks, shows, sales.
- Venereal--the virus shed in the semen of a carrier stallion (cooled or frozen semen can be infectious).
- Other bodily secretions--urine, feces, etc.
- In utero--the virus passes across the placenta from an acutely infected mare to her unborn foal (uncommon).
- Indirect contamination--tack and/or equipment shared among horses.

There is a very real risk of EVA being transferred indirectly via personnel and fomites (objects in the environment capable of carrying the virus from an infected horse to another uninfected horse for example equipment and bedding). Special care should be taken when handling semen in laboratories prior to insemination or preparation for shipping.

The presence of EAV in the reproductive tracts of clinically infected mares has not been as well characterized as the stallion. A study at the University of Kentucky documented EAV in urine, vaginal secretions, and feces. Oklahoma State University studies documented EAV in ovary, oviduct (a pair of tubes in the female reproductive tract that transport eggs from the ovary to the uterus), oocyte (female reproductive cell; the egg), and uterine secretions.

### The Impact of EVA

EVA can have significant economic consequences for both the breeding and performance sectors of the horse industry. Direct financial losses resulting from outbreaks of the disease on breeding farms can be summarized as follows: losses due to abortion and/or disease and death in very young foals, decreased commercial value of stallions that become persistently infected with the virus, reduced demand to breed to carrier stallions because of the added expense and inconvenience involved in vaccinating and isolating mares before and after breeding, and denied export markets for carrier stallions and infected semen. An outbreak of EVA at a racetrack, equestrian event, or horse show can have considerable impact because of the widespread potential upon returning home after exposure. This impact may include direct financial losses such as abortion, pneumonia in newborn foals, infected stallions, disruption of training schedules, reduced competition entries, and event cancellations. The impact at the international level will effect the trade of horses and semen because of denied export opportunities for carrier stallions and EVA infective semen. In fact, in some countries, trade is effected in all categories of horses that have undocumented antibodies to the virus.

### Control and Prevention

EVA is a manageable disease. Your veterinarian can help you design effective strategies for control and prevention. These strategies include:

- o A major factor in determining success of any control program is minimizing or eliminating direct or indirect contact of susceptible (uninfected) horses with the secretions/excretions of EVA infected animals.
- o Effective strategies for control and prevention must be horse industry driven; it is the industry's disease to control or spread.

- o There is no zoonotic concern (EVA cannot be transmitted from horses to humans).
- o The aim is to restrict spread of EAV in breeding populations, prevent outbreaks of virus-related abortion or illness in young foals and prevent the establishment of the carrier state in stallions and post-pubertal colts.

There is a safe and effective EVA vaccine (Arvac®, Fort Dodge Animal Health).

- This vaccine has been shown to be both safe and effective for use in stallions, non-pregnant mares, geldings, fillies and colts.
- There is no evidence that a vaccinated stallion will shed virus in their semen or develop the carrier status.
- It is not labeled for use in the pregnant mare, or in foals less than six weeks of age and should normally be avoided in these situations. There is always a concern that a problem may occur when a pregnant mare is vaccinated with a modified live virus vaccine. But in the situation where there is potential a pregnant animal may be exposed to the wild type virus (an outbreak), the risk of disease is greater than the apparent small risk of a problem occurring when the pregnant mare is vaccinated with the available EAV vaccine. Those risks should be discussed between the horse owner and the veterinarian before vaccinating a pregnant mare.

## Vaccination

- o Vaccinate only healthy, non-stressed horses.
- o If all horses are not being vaccinated at the same time on the premises, isolate those being vaccinated from those not being vaccinated (those remaining sero-negative—serum does not contain antibody to EVA). There is a minimal potential for vaccine virus to be shed and spread to other horses.
- o Vaccinate all horses according to the labeled instructions. (Note: Not for use in foals less than six weeks of age except in emergency situations when threatened by natural exposure.)
- o Stallions and mares should be vaccinated not less than three weeks prior to breeding.
- o Pregnant mares should not be vaccinated during the last two months of gestation, since a few instances of fetal invasion by vaccine virus have been demonstrated during this period. When pregnant mares are threatened by known natural exposure, vaccination may be undertaken with considerably less risk than is inherent in natural infection.
- o Newborn foals (less than six weeks of age) should not be vaccinated except in emergency situations when threatened by natural exposure.
- o Vaccinate all immature colts before 270 days of age, about seven to nine months. If this protocol is implemented over a number of years, this would greatly reduce the number of carrier stallions, effectively eliminating the primary reservoir.

The vaccine has been successfully used to help control the spread of this disease. Primary vaccination affords protection against clinical disease for several years. If initial vaccines are exposed to field virus for the first time via venereal or aerosol transmission, they will probably have a limited re-infection cycle and be short-term shedders of the field strain virus (approximately one week). Revaccination normally results in a pronounced increase in antibody titers (level of antibody in the blood) and protection against the disease.

## Specific Biosecurity Measures

1. Isolate all new arrivals for three to four weeks.
2. If at all possible, separate pregnant mares from other horses.
  - Maintain pregnant mares in small groups according to predicted foaling dates.
3. Prior to each breeding season, have your veterinarian blood-test all new breeding stallions for EAV titers.
  - Culture semen from all non-vaccinated stallions with positive titers, for infectious virus.
4. Annually vaccinate all non-carrier breeding stallions not less than three weeks prior to the start of each breeding season.
5. Physically isolate any EAV-carrier stallions.
6. Observe strict precautions when breeding carrier stallions or collecting infectious semen.
  - Risk of inadvertently transferring infection via indirect contact.
7. Limit breeding carrier stallions to vaccinated mares or mares with natural titers.
  - Mares with natural titers only need to be isolated for 24 to 48 hours after breeding due to normal sloughing of semen associated virus.
8. Vaccinate mares with negative titers at least three weeks prior to breeding to a known carrier stallion or artificial insemination (AI) with infectious semen.
9. Isolate initial vaccinated mares for three weeks post-breeding from all horses except those known to have EAV-positive titers.
  - It is especially important that these mares do not have contact with pregnant mares by any route, aerosol (breathe the same air), respiratory and/or indirect contact because they may shed field virus during this time.
  - Isolate for 24 to 48 hours afterwards for all subsequent breeding cycles as with mares with natural titers.
10. In breeds and/or areas with high prevalence of EAV infection.
  - Vaccinate all immature colts before 270 days of age, about seven to nine months.
  - If the above protocol is implemented – over a number of years this would greatly reduce the number of carrier stallions and effectively eliminate the primary reservoir.
11. Determine the infectivity status of all semen for AI.

For more information concerning how to control and prevent EVA, contact your local veterinarian.

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